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Transcript of Philip Botham, Ph.D., Corporate Designee, Volume 2

Date: September 18, 2024

Case: Paraquat Products Liability Litigation, In Re:

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

Case ID: 220300429
Control No.: 26064959

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Transcript of Philip Botham, Ph.D., Corporate Designee, Volume 2 1 (339 to 342)

Conducted on September 18, 2024

339 1 PHILADELPHIA COUNTY COURT OF COMMON PLEAS 2 TRIAL DIVISION 3 -----) 4 IN RE: PARAQUAT PRODUCTS) 5 LIABILITY LITIGATION,) 6) Case No. 7 This Document Relates to All) 220500559 8 Actions) 9 -----) 10 **CONFIDENTIAL** 11 Videotaped deposition of 12 DEFENDANT SYNGENTA 13 by and through its corporate representative 14 DR. PHILIP BOTHAM 15 Volume II 16 (pages 339 - 690) 17 London, England 18 United Kingdom 19 Wednesday, September 18, 2024 20 21 22 23 Job No. 553164 24 Reported stenographically by: 25 LEAH M. WILLERSDORF, RMR, CRR, FBIVR, ACR, QRR2, CLR	341 1 A P P E A R A N C E S 2 3 On behalf of Plaintiffs: 4 THE MILLER FIRM LLC 5 The Sherman Building 6 108 Railroad Avenue 7 Orange, VA 22960 8 (540) 882 2525 9 10 BY: DAVID J. DICKENS, ESQ. 11 JEFFREY TRAVERS, ESQ. 12 ddickens@millerfirmllc.com 13 jtravers@millerfirmllc.com 14 15 On behalf of Defendant Syngenta and the witness: 16 KIRKLAND & ELLIS LLC 17 1301 Pennsylvania Avenue, N.W. 18 Washington, D.C. 20004 19 (202) 389 5000 20 21 BY: RAGAN NARESH, ESQ. 22 ragan.naresh@kirkland.com 23 24 On behalf of Defendant Chevron: 25 JONES DAY 26 250 Vesey Street 27 New York, NY 10281-1047 28 (212) 326 3939 29 30 BY: AMANDA SIMMS, ESQ. (via Zoom) 31 klahaszow@jonesday.com 32 33 34 35
340 1 2 Wednesday, September 18, 2024 3 4 09:02 a.m. to 6:03 p.m. 5 (British Summer Time) 6 7 Volume II of the videotaped deposition of 8 SYNGENTA, by and through its corporate representative 9 DR. PHILIP BOTHAM, held at the offices of Kirkland 10 & Ellis LLP, 30 St. Mary Axe, London EC3A 8AF, 11 England, United Kingdom, before Leah M. Willersdorf, 12 Registered Merit Reporter and Certified Realtime 13 Reporter, both with the US National Court Reporters 14 Association, and Fellow of the British Institute of 15 Verbatim Reporters, Accredited Court Reporter, 16 Qualified Realtime Reporter (Level 2), and Certified 17 LiveNote Reporter. 18 19 20 21 22 23 24 25	342 1 A P P E A R A N C E S 2 (continued) 3 On behalf of Defendant FMC Corporation: 4 TROUTMAN PEPPER LLP 5 3000 Two Logan Square 6 Eighteenth and Arch Streets 7 Philadelphia, PA 19103 8 (215) 981 4000 9 10 BY: CHRISTINA M. BOSTON, ESQ. (via Zoom) 11 christina.boston@troutman.com 12 13 ALSO PRESENT 14 Mark Smith, Esq. - Syngenta 15 Brian Brake - The Miller Firm 16 (via Zoom) 17 Barry Boise - Troutman Pepper 18 (via Zoom) 19 Randi Ellis - Special Master 20 Jeremy Dineen - Videographer 21 Linda Fleet - Remote technician 22 23 24 25

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352 1 (On the record at 09:02 a.m.) 2 THE VIDEOGRAPHER: Here begins media 3 number 1 in the continued videotaped deposition of 4 Philip Botham, In Re: Paraquat Products Liability 5 Litigation, in the Philadelphia County Court of Common 6 Pleas. 7 Today's date is September 18, 2024. The 8 time on the video monitor is 09:03 a.m. 9 The videographer today is Jeremy Dineen 10 representing Planet Depos. 11 This video deposition is taking place at 12 Kirkland & Ellis in London, England. 13 Would counsel please voice-identify 14 themselves and state whom they represent. 15 MR. DICKENS: David Dickens on behalf of 16 plaintiffs, and Jeffrey Travers on behalf of 17 plaintiffs. 18 MR. TRAVERS: Sorry. 19 MR. NARESH: Ragan Naresh on behalf of 20 Syngenta. 21 MR. SMITH: Mark Smith, Syngenta. 22 MS. SIMMS: Amanda Simms, Jones Day, for 23 Chevron. 24 MS. BOSTON: Christina Boston for FMC 25 Corporation.	354 1 BY MR. DICKENS: 2 Q. We were talking about the biomonitoring 3 and the measurement of plasma in those particular 4 studies. 5 Do you recall that? 6 A. I do. 7 Q. And the last document we had looked at 8 mentioned not opening the can of worms, was a comment 9 from Bruce Woollen in that email. 10 Do you recall that? 11 A. Yes. 12 Q. And part of the concern with the testing 13 of plasma was worry with respect to how that would be 14 handled by regulatory agencies, correct? 15 A. No, not entirely. It's more of a 16 technical issue as to why a single plasma sample and 17 the paraquat that you would find would actually be 18 interpreted, or interpretable, more accurately. 19 Q. And you said "not entirely." At least one 20 of the concerns for Syngenta in measurement -- or 21 measuring plasma in the biomonitoring studies was how 22 the regulatory agencies would react? 23 A. The two are related because if you -- if 24 data is created and, actually, it's not essentially an 25 accurate representation of exposure, then clearly

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355 1 there's a concern that a regulatory authority 2 would not necessarily see that context. 3 Q. Not see that context in not understanding 4 Syngenta's position with respect to the relevance of 5 plasma from biomonitoring studies? 6 MR. NARESH: Objection to form. 7 THE WITNESS: What Syngenta always tried 8 to do with those studies was to try to get the best 9 available information on exposure, and urinary 10 monitoring was the quality standard, I guess you would 11 say, to do that. 12 MR. DICKENS: Okay. I'm going to mark 13 Exhibit 51 for the record. 14 (Exhibit 51 marked for identification.) 15 MR. DICKENS: This is topic 17 from the 16 Notice of Deposition. 17 BY MR. DICKENS: 18 Q. Exhibit 51 are minutes from a PSAC Tox 19 Subcommittee Meeting held by Syngenta on March 29, 20 1988, correct? 21 A. Correct. 22 Q. And you've reviewed this document prior to 23 today? 24 A. Yes, I believe I have seen this before. 25 Q. Now, there's -- under "1. Recommended	357 1 interpretation. 2 Q. So you made a determination that this 3 study did not give accurate scientific information? 4 A. Well, that was not a determination I made 5 personally. And this is in consultation with people 6 who were experts in the field. So I don't say this is 7 definitely good and that's definitely bad; that's not 8 my area of expertise. 9 Q. Consultation with who that you made that 10 determination? 11 A. I don't recall exactly with whom I had a 12 consultation specifically about that study. 13 Q. Okay. Did you discuss this 1988 Malaysia 14 study with anyone in preparation for today's 15 deposition specifically? 16 A. I don't think I went into any detail on 17 this study, no. 18 Q. All right. It mentioned the trial 19 involved the 1 in 40 dilution, and: 20 "... 24 sprayers were involved; half in 21 normal clothing and others allowing maximal 22 exposure..." 23 Right? 24 A. Yes. 25 Q. Now, this clothing, this would be kind of
356 1 Spray Strength" and it mentions results of a 2 spray/absorption trial in Malaysia in 1988, correct? 3 A. It certainly mentions the spray trial in 4 Malaysia. I'm just looking at where the date was, 5 but -- 6 Q. And just the date of the actual minutes of 7 this meeting were March -- 8 A. Yeah, yeah, okay. 9 Q. And this would have been the Malaysia 10 trial in which we saw they measured plasma that we 11 looked at previously, right? 12 A. I think that's right. 13 Q. Now, you had, in your notes, Exhibit 1, 14 included a list of human exposure studies, correct? 15 A. That's right. 16 Q. The Malaysia 1988 study where they 17 measured plasma is not included in the list in your 18 notes; isn't that right? 19 A. That's right, it's not there, yeah. 20 Q. Is there a particular reason you left that 21 study out? 22 A. I think it's probably in part because of 23 what we have just been describing in terms of the -- 24 what are the key studies, which were the ones which 25 really gave us the most accurate scientific	358 1 the habitual study, right, of people spraying with 2 what they would typically wear? 3 A. Yes, I think that's right. 4 Q. Syngenta didn't instruct or have half the 5 people wear minimum clothing? 6 A. That would be certainly true if it was 7 habitual. 8 Q. Do you know if it was habitual? 9 A. No, I don't know for sure because it 10 doesn't say so here, but it was -- I would suggest it 11 probably is. 12 Q. Okay. It mentions: 13 "Under the latter conditions, an 14 unexpected number of positive [...] tests [...] and 15 spraying was halted on day 3." 16 Right? 17 A. Yes. 18 Q. 11 of 24 had nasal irritation, 5 of 24 19 with nosebleeds, correct? 20 A. Correct. 21 Q. It says: 22 "Recent analysis of results (only 12 23 available) has shown that all the maximally exposed 24 sprayers had detectable levels of paraquat in 25 plasma..."

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359 1 Right? 2 A. It does. 3 Q. Okay. Now if we can turn the page, 4 halfway down the page there's a paragraph that begins 5 "LLS..." 6 Do you see that? 7 A. Yes. 8 Q. And do you understand that to be referring 9 to Lewis Smith? 10 A. It is. 11 Q. Lewis Smith, he was with ICI? 12 A. He was. 13 Q. It says: 14 "[Lewis Smith] raised the point of the 15 detection of paraquat in the plasma and the fact that 16 this was the first time it had been observed and 17 related this to the problem that may arise with the 18 EPA." 19 Right? 20 A. That's what it says. 21 Q. What's the problem with the EPA with 22 respect to plasma results? 23 MR. DICKENS: Objection to form, 24 foundation. 25 THE WITNESS: I really wouldn't be able to	361 1 yesterday who were the experts in modeling. 2 Q. Okay. So these are experts in the 3 modeling, as you indicated, to determine exposure, 4 right? 5 A. Yes. 6 Q. And they did, in fact, do that; is try to 7 determine exposure for paraquat and assisted Syngenta? 8 A. Yes, they helped us to build these models. 9 Q. I want to direct your attention to the 10 page ending in 5651. 11 At the bottom of the page, there's a 12 section beginning "Human," right? 13 A. Yes. 14 Q. In the middle of that paragraph, the 15 sentence: 16 "In the Malaysian banana plantation study 17 [...], there were three subjects with measurable 18 concentrations in both plasma and urine..." 19 Right? 20 A. Yes. 21 Q. And do you understand this to be referring 22 to the 1988 study that we just looked at in Malaysia? 23 A. Well, I would need notice of that just to 24 be absolutely sure. 25 Q. Are you aware of any other Malaysian study
360 1 comment. This was 1988, a long time ago and I've no 2 idea what Lewis Smith had in mind at that time. 3 BY MR. DICKENS: 4 Q. EPA at this time was concerned about the 5 toxicity of paraquat? 6 A. EPA has reviewed the toxicity of paraquat 7 over a long period of time. It's been under constant 8 review. So it's certainly in EPA's mind, and so that 9 would be always one of the considerations. 10 MR. DICKENS: I want to look at another 11 document. Exhibit 52. 12 (Exhibit 52 marked for identification.) 13 MR. DICKENS: Topic 17 from the Notice of 14 Deposition. 15 BY MR. DICKENS: 16 Q. This is a paraquat PBPK model for 17 cross-species dosimetry, correct? 18 A. That's correct. 19 Q. And it was dated April 10 of 2014 and 20 prepared by individuals at the Hamner Institute, 21 correct? 22 A. That's right. 23 Q. And they were involved in the PBPK 24 modeling study undertaken by Syngenta, right? 25 A. These were the people I referred to	362 1 where plasma was taken? 2 A. Again, I would have to double-check that, 3 but let's assume that it is for now. 4 Q. We can agree Dr. Woollen said no plasma 5 was taken in any of the studies, right? 6 A. Okay. 7 Q. That's correct? 8 A. That's what he said, yes. 9 Q. Okay. Now, the experts retained by 10 Syngenta undertook -- for the PBPK modeling, analyzed 11 some of the plasma data along with the urine: 12 "For subjects 13 and 16, the similarity in 13 plasma and urinary excretion patterns allowed for the 14 same dermal absorption constant..." 15 Do you see that? 16 A. Right, I'm sorry, I'm catching you up. 17 Q. Sorry. On the next page. 18 A. Yep. Yeah. 19 Q. It's about -- the second full sentence. 20 A. Yes, okay. I can see that, yes. 21 Q. Now, the dermal absorption constant, 22 that's the rate of absorption rate, and dose? 23 A. Yes. 24 Q. And they determined the estimated dermal 25 doses based on the plasma and urinary excretion

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363 1 pattern for that particular individual to be 0.9, 1.8 2 and 0.9 for subject 13, right? 3 A. Okay, yes. 4 Q. And 1.6, 3.4 and 1.0 for subject 16? 5 A. That's what it says, yes. 6 Q. Now, in determining -- you can use the 7 body weight of a human, which has been estimated 8 roughly as 70 kilograms, correct? 9 A. Yes. 10 Q. And you can use that to determine those 11 individuals' exposure levels, right? 12 A. Yes. 13 Q. And compare that to the AOEL? 14 A. Yes. 15 Q. And the AOEL, that's the milligrams of 16 the chemical per kilogram of body weight? 17 A. That's how it's expressed. 18 Q. So you would divide those milligrams per 19 day by the 70 kilograms to -- if you estimate 70, 20 right? 21 A. Yes. 22 Q. And if you do that, then, for the 23 individual who, at the highest exposure level, 3.4 -- 24 A. Yes. 25 Q. -- 3.4 milligrams per day divided by	365 1 would you like me to do? 2 BY MR. DICKENS: 3 Q. Okay. So we're going to take the 4 3.4 milligrams per day divided by the 70 kilograms. 5 A. Yep. 0.048. 6 Q. And 0.048, that would be that particular 7 individual's exposure level, right, if you assume 8 70 kilograms? 9 A. Yes. 10 Q. And the acceptable operator exposure level 11 for paraquat is 0.0005, right? 12 A. Yes, which is -- comes from a calculation 13 where there's a 100-fold safety factor added. 14 Q. Okay. And so when this is -- so the 0.05, 15 that is -- or 0.048, that's roughly a hundred times 16 over the acceptable operator exposure level, right? 17 A. Yeah, but I'm not quite sure where you're 18 going with this, but let's just -- yeah, do carry on. 19 Q. That's correct, you'd agree with that? 20 A. I've got a feeling we're missing something 21 here, but, you know, this -- you know, you're 22 subjecting me to mathematics which, you know, I'd 23 really, ideally, need some notice on, but what's -- 24 let's proceed. 25 Q. Okay. Well, you'd agree that 0.048 is
364 1 70 kilograms, that would be about 0.048 or close to 2 0.05, would it not? 3 MR. NARESH: I'll object to the form. 4 THE WITNESS: Yes. 5 MR. NARESH: If you have a calculator. 6 THE WITNESS: Well, yes, I don't have 7 a calculator to hand, exactly, I was just going to 8 say. 9 Yes, I take your word for the calculation 10 you've just done. 11 MR. NARESH: Yeah, and, you know, if 12 you're going to have him do long division, I'd rather 13 he do long division as opposed to -- and if you're 14 right, great, and if not, that's -- you know, we'll 15 deal with that. But I don't want the witness winging 16 it on the math. 17 BY MR. DICKENS: 18 Q. Do you happen to have a calculator with 19 you? 20 A. I don't. 21 Q. Okay. 22 MR. DICKENS: I mean, I can give him 23 a calculator. 24 MR. NARESH: Sure, yeah. 25 THE WITNESS: Okay. And what calculation	366 1 roughly 100 times the 0.0005? 2 A. Well, that's true. 3 MR. NARESH: Let me have a continuing 4 objection on this whole line of questioning, if I may, 5 so I don't interrupt you each time. But I don't think 6 this is fairly within the scope of the notice and 7 I don't think it's fair to the witness to ask him to 8 do operator exposure calculations on the fly when 9 conducting operator exposure calculations was not part 10 of the notice. 11 I'll make that objection one time. Unless 12 you'd like me to make it each time. 13 MR. DICKENS: No; standing objection. 14 MR. NARESH: Okay. 15 BY MR. DICKENS: 16 Q. Do you agree with that? That 0.048 is 17 roughly 100 times the 0.0005 acceptable operator 18 exposure level? 19 A. It is, yes. 20 Q. And you would agree that in order to 21 calculate an individual's exposure level, you would 22 take the milligrams per day and divide that by their 23 weight in kilograms? 24 A. To get milligrams per kilograms per day, 25 yes.

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367 1 Q. And that's the operator exposure level? 2 A. Yes. 3 Q. And that's how the acceptable operator 4 exposure level is derived from? 5 A. Yes. 6 Q. Okay. I just want to point out, if you 7 can turn to the next page, there's some Syngenta 8 reports that were reviewed in preparation of this 9 document by those experts retained by Syngenta. And 10 the very last one, that's 1988, paraquat analysis of 11 urine and plasma from Malaysian operator exposure 12 study, right? 13 A. Yes. 14 Q. That's the operator exposure study we were 15 just looking at? 16 MR. NARESH: I'll object on that; 17 foundation, mischaracterizes the prior testimony. 18 BY MR. DICKENS: 19 Q. Is that correct? 20 A. Yes, I believe so. 21 Q. We can put that aside. 22 A. Can I give you your calculator back? 23 Q. Thank you. 24 MR. DICKENS: Why don't we go ahead and 25 mark Exhibit 53 for the record.	369 1 A. Yes, that's what he said. 2 Q. And he gives percent AOELs, so you don't 3 have to do the math, from this particular study, 4 right? 5 A. Yes. 6 Q. And for those two individuals, one 7 exceeded the AOELs, 282 percent of the AOEL, right? 8 A. Yes. 9 Q. So roughly 2.8 times; yeah? 10 A. Yes. 11 Q. And the other rough -- over five times 12 the AOEL? 13 A. That's correct, yeah. 14 Q. And this obviously was a concern within 15 Syngenta with respect to the fact that there were 16 individuals in these exposure studies who were 17 exceeding the AOEL? 18 A. Yes. I mean, it was a surprise. It 19 doesn't -- it normally doesn't happen, if you look at 20 the totality of all the operator exposure studies, and 21 I think we've just been discussing Malaysia, but there 22 are many, many studies. And exceeding the AOEL is not 23 the normal situation, and when it does happen, as was 24 the case here, there are often explanations as to why 25 people got a higher exposure than they should have
368 1 (Exhibit 53 marked for identification.) 2 BY MR. DICKENS: 3 Q. I've handed you Exhibit 52 -- 4 THE STENOGRAPHER: 53. 5 BY MR. DICKENS: 6 Q. -- 53. This is from topic 17 once again, 7 and it's an email chain from June of 2007. 8 Do you see that? 9 A. I do, yes. 10 Q. This is from a Dr. Brouwer to individuals 11 at Syngenta, correct? 12 A. That's correct. 13 Q. And this is referring to the studies we 14 looked at yesterday conducted by Brouwer who was with 15 TNO, right? 16 A. That's right. 17 Q. And he sends the results of the particular 18 study to Syngenta and then, on June 15, 2007, 19 Martin Wilks responds to those internally at Syngenta, 20 right? 21 A. That's right. 22 Q. And looking at those results, he says: 23 "... this is bad news whichever way you 24 look at it." 25 Right?	370 1 done. 2 (Exhibit 54 marked for identification.) 3 MR. DICKENS: Let's go ahead and look at 4 54. It's topic 31 in the Notice of Deposition. 5 BY MR. DICKENS: 6 Q. Now, this is a document from the Swedish 7 regulatory agency, comments on paraquat report and 8 proposed decision of the United Kingdom made to the 9 European Commission, right? 10 A. That's correct. 11 Q. And we discussed a little bit yesterday, 12 the Court decision with respect to the 13 European Commission, right? 14 A. That's right. 15 Q. Now, by this point in 1997, Sweden had 16 banned the use of paraquat within the country? 17 A. I don't remember the date when Sweden did 18 that. 19 Q. Sweden filed a lawsuit challenging a 20 decision to register paraquat by the EU? 21 A. That, I do remember, certainly. 22 Q. And the EU court determined that 23 procedures were not followed in approving or 24 registering paraquat, correct? 25 A. As mentioned yesterday, it was a

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371 1 procedural decision, yes. 2 Q. Now looking to this document. If you 3 could go to page 3. In 1997, Sweden notes: 4 "The proposed AOEL(s) is exceeded by 5 the UK absorption rate model [...] and the German 6 model..." 7 Right? 8 A. Yeah. 9 Q. That was the determination of Sweden, that 10 the AOEL would be exceeded by using this absorption 11 rate model in the UK as well as the German model, 12 right? 13 A. Yes. 14 Q. Now, what is the UK absorption rate model? 15 A. This is at a level of technical detail 16 which I can't comment on. I'm not an expert in the 17 field of these different models. I know that there 18 are many different models that regulatory authorities 19 use to calculate AOELs, and exposure -- how exposure 20 relates to those AOELs. 21 Q. But under those models, according to 22 Sweden, they were -- the AOEL for paraquat was 23 exceeded, right? 24 A. That's what they -- that's right. They 25 did say that, yes.	373 1 exposed to without being at risk for health effects? 2 (Stenographer clarification.) 3 MR. DICKENS: Yeah. 4 BY MR. DICKENS: 5 Q. AOEL, once again, is the amount that an 6 individual can be exposed to without the risk of 7 health effects? 8 A. And it's derived from a 'no effect' level 9 in a toxicity study, and that -- which toxicity study 10 is chosen can differ again, in the way as I've just 11 described, to which are usually a 100-fold safety 12 factor is added. So it's -- an AOEL does not equate 13 to something which is at or close to the toxicity 14 level of a substance such as paraquat. 15 MR. DICKENS: Take a look at Exhibit 55. 16 (Exhibit 55 marked for identification.) 17 MR. DICKENS: Topic 17 in the Notice of 18 Deposition. 19 BY MR. DICKENS: 20 Q. This is additional comments to the report 21 and proposed decision of the United Kingdom, right? 22 A. Yes. 23 Q. And these are, once again, from Sweden? 24 A. They are from Sweden, commenting on that 25 same United Kingdom report, yes.
372 1 Q. For both knapsack spraying and spraying by 2 tractor? 3 A. That's what they said, yes. 4 Q. Any reason to dispute that that's correct 5 using those models? 6 A. Depends what you mean by "correct." 7 I mean, these things are mathematical and the way in 8 which the mathematics works can sometimes -- will 9 differ from one model to another. And so when you 10 talk about exceedance, then it doesn't -- not 11 necessarily mean that that exceedance inevitably means 12 that that is a health risk. 13 Q. They note: 14 "Based on urine concentrations, AOEL(s) 15 was exceeded in the knapsack study." 16 Right? 17 A. Yes. 18 Q. And then, for the tractor study, highest 19 exposure level, the proposed long-term AOEL was 20 exceeded and the short-term AOEL was close to be 21 exceeded. 22 Right? 23 A. Yes. 24 Q. Now, the AOEL, once again, that's 25 established as the amount that an individual can be	374 1 Q. In the first paragraph under "General 2 comments," it notes critical health effects of 3 paraquat, including the possible effects of delayed 4 neurotoxicity, right? 5 A. Yes, that's what it says. 6 Q. Turn to page 2. From the neurotoxicity, 7 Sweden notes: 8 "Paraquat should be more closely evaluated 9 as a potentially neurotoxic agent." 10 Correct? 11 A. That's what it says, yes. 12 Q. And then they give some information again 13 on the operator exposure, right? 14 A. Yes. 15 Q. They say, once again: 16 "... AOEL is almost always readily 17 exceeded, with or without PPE, according to 18 the UK-POEM and the BBA models." 19 Right? 20 A. Right, and, again, that illustrates my 21 previous point that exceedances of the AOEL are very 22 dependent on the model that you use, and the key 23 parameter in the models is, essentially, the way in 24 which the exposure estimations are used. And some are 25 very conservative, others are, I would guess you would

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375 1 say, more realistic. 2 Q. Well, earlier you testified that the AOEL 3 was almost never exceeded; it was exceedingly rare for 4 that to be the case, right? 5 A. If it -- again, it depends on which model 6 you choose to use. But, yes, I mean, those two 7 examples we saw earlier this morning of the 8 exceedances of the AOEL were the ones which we 9 certainly agreed were clear exceedances of the AOEL, 10 whichever way you looked at it, but they were not the 11 normal situation. 12 Q. Syngenta's position is that any exceedance 13 of the AOEL would be extremely rare? That's 14 Syngenta's position, right? 15 A. No, I'm not saying extremely rare. It's 16 not -- they are not things which would -- which were 17 routinely seen. Most people are not exposed to levels 18 exceeding the AOEL. 19 Q. Sweden certainly disagrees with you, 20 though. They say it's almost always readily exceeded, 21 right? 22 A. That's because of the conservative nature 23 of them -- of the models that are being used here. 24 Q. Do you think the UK POEM and the BBA 25 models are inappropriate to determine whether an	377 1 Syngenta's position as to foreign POEM and BBA models 2 is within the notice, this is precisely why we sought 3 to get from you the nature of the questions that 4 you're asking about certain documents and you refused 5 to give them. 6 So I don't think the questions that you're 7 asking are fairly within the scope of the notice, nor 8 have those been identified in subsequent 9 correspondence, despite extensive efforts by us to get 10 the kind of detail about the kinds of things they are 11 looking for. 12 So you can ask the questions but these are 13 all outside of the scope of the notice. And to the 14 extent Dr. Botham can -- 15 (Stenographer interjection.) 16 MR. NARESH: And to the extent Dr. Botham 17 can answer those in his personal capacity, I have no 18 objection to that but it is not proper corporate 19 representative testimony. 20 MR. DICKENS: Your objection is noted. 21 BY MR. DICKENS: 22 Q. Now, we go on: 23 "The results from exposure models clearly 24 show that the operator cannot reasonably protect 25 himself from exposure by wearing commonly used PPE."
376 1 individual's exposure exceeds the AOEL? 2 MR. NARESH: I'll object to scope and 3 foundation. 4 THE WITNESS: Now we're moving into a 5 level of detail that would require an operator 6 exposure expert to comment on. I'm not such an 7 expert, so in answering such a question, I would 8 always rely on somebody to say -- to help me to 9 understand where all those conservatisms and 10 differences lie. 11 BY MR. DICKENS: 12 Q. You reviewed the statement by Sweden 13 in preparation for today's deposition, right? 14 A. Yes. 15 Q. Did you do anything to evaluate the UK 16 POEM and the BBA models? 17 A. No, I did not. 18 MR. NARESH: Tell me where in the notice 19 it says Syngenta's evaluation of the POEM and BBA 20 models is identified. 21 MR. DICKENS: About this particular 22 document we identified and we're going to ask him 23 questions about this document. 24 MR. NARESH: And you can ask questions, 25 but, Counsel, to the extent you're arguing that	378 1 Right? 2 A. I completely disagree with that statement. 3 Those models don't tell you that. They actually are 4 models which give a very conservative interpretation 5 of the safety margins and they do not, in any sense, 6 suggest that an operator is unable to protect 7 themselves from the toxicity of paraquat. 8 Q. If operators were almost always exceeding 9 the acceptable operator exposure level, then that 10 would be evidence that individuals cannot protect 11 themselves even by wearing common PPE, right? 12 MR. NARESH: Objection; form, foundation, 13 and scope. 14 BY MR. DICKENS: 15 Q. You'd agree with that at least? 16 A. No, I would not agree with that. Again, 17 it depends on which model you're talking about and how 18 conservative that is. And in any case, even in the 19 least conservative, there is -- there are -- there is 20 still that 100-fold safety margin between the AOEL and 21 the 'no effect' level from a toxicity study which is 22 also a part of the protection. 23 So I don't -- I disagree that people are 24 -- that workers are unable to protect themselves from 25 the potential health effects of paraquat.

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379 1 Q. With the commonly worn PPE? 2 A. With – exactly. As always, assuming that 3 the individuals are wearing PPE and are complying with 4 other label instructions and they're not using the 5 product in a way which we wish they should not be. 6 Q. Now, the PPE identified in -- for wearing 7 in the United States, for spraying, that's always 8 included long-sleeved shirts, long pants, right? 9 A. I think we'd need to look at labels to be 10 absolutely sure about that, but that's the kind of 11 PPE, yes. 12 Q. Do you know whether or not the PPE 13 recommended in the labeling in the United States has 14 ever included more than a long-sleeved shirt or long 15 pants while spraying? 16 MR. NARESH: I'll object to the extent you 17 -- if you'd like to show him labels, I think he can 18 answer questions about labels, but if you're asking 19 him for total recall of 60 years of labels, I don't 20 think that's a fair question. 21 THE WITNESS: Absolutely. And, again, in 22 my discussions with Mr. Dixon I referred to yesterday, 23 we were looking at some examples of that, and 24 I certainly don't have documents in front of me, 25 labels in front of me, to be able to definitively	381 1 Q. And the next page, second page, the 2 purpose of the study was: 3 "To provide information on the efficiency 4 of various protective clothing materials against 5 paraquat penetration from a Gramoxone formulation, the 6 penetration rates and breakthrough times for 7 paraquat..." 8 Right? 9 A. Yes. 10 Q. And they tested a polyethylene-coated 11 Tyvek, Saran-coated Tyvek, Tyvek, Kinguard, Corovin, 12 and unfinished cotton. 13 Right? 14 A. Yes. 15 Q. And they applied Gramoxone to these 16 materials to determine the penetration rate and 17 breakthrough times? 18 A. Yes. 19 Q. Turn to page 6. There's a discussion, 20 right? 21 A. Yes. 22 Q. "No paraquat [...] was found to have 23 penetrated the polyethylene-coated and Saran-coated 24 Tyvek during the 6-hour exposure time." 25 A. Yes.
380 1 confirm. 2 MR. DICKENS: I'm going to hand you 3 Exhibit 56 for the record. 4 (Exhibit 56 marked for identification.) 5 BY MR. DICKENS: 6 Q. I've handed you Exhibit 56, which is a 7 study "Paraquat: Penetration through protective 8 clothing materials from a Malaysian 'Gramoxone' 9 formulation," by R.J. Scott, R.C. Scott, dated 10 March 14, 1986. 11 Do you see that? 12 A. R.J. Ward and R.C. Scott, yes. 13 Q. Okay, thank you. 14 And this is a document you reviewed in 15 preparation for today's deposition, right? 16 A. That's right. 17 Q. And so this study or report was compiled 18 in order to determine how paraquat can penetrate 19 through protective clothing materials, and they used a 20 Malaysian Gramoxone formulation, right? 21 A. That's correct. 22 Q. And the Malaysian Gramoxone formulation, 23 that included a surfactant? If you know. 24 A. I don't know for sure, but I believe so. 25 But I would need to have confirmation of that.	382 1 Q. Right? 2 A. Correct. 3 Q. Now, at the bottom, the last sentence of 4 that paragraph: 5 "Tyvek, Corovin and unfinished cotton 6 offered little resistance to either formulation, the 7 breakthrough times being immediately after 8 application." 9 Right? 10 A. Yes. 11 Q. And that's what Syngenta found in this 12 particular study? 13 A. Yes, it did. 14 Q. "These data would indicate both 15 polyethylene-coated and Saran-coated Tyvek will offer 16 spray operators protection against both concentrate 17 [...] and the spray strength dilution." 18 That's another finding Syngenta had in 19 1986, right? 20 A. That's what this study showed. 21 Q. And then it gives the results for the 22 Tyvek, Corovin and unfinished cotton, right? 23 A. Yes. 24 Q. It says it: 25 "... cannot be recommended for protective

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383 1 clothing for use during the application of Gramoxone." 2 Right? 3 A. That's what this report says. 4 Q. Right. This report says that Tyvek, 5 Corovin and unfinished cotton cannot be recommended 6 because it does not offer protection against the 7 concentrate or the spray-strength solution. 8 Right? 9 MR. NARESH: Objection; asked and 10 answered. 11 THE WITNESS: That's what this report 12 says. 13 MR. DICKENS: You can put that aside. 14 I'll hand you Exhibit 57. 15 (Exhibit 57 marked for identification.) 16 BY MR. DICKENS: 17 Q. All right. Exhibit 57 is another study 18 undertaken by Syngenta, this time in November of 1987, 19 this time studying the "Absorption through Wellington 20 and trooper boots from Gramoxone?" 21 A. That's correct. 22 Q. Do you know what Wellington and trooper 23 boots are? 24 A. Different types of footwear which can be 25 used in situations such as the application of	385 1 A. Yes, exactly. 2 Q. Turn to page 2, or the last page. 3 A. Yes. 4 Q. Under the Conclusion section: 5 "No paraquat was detected to have 6 penetrated through the Wellington boot material during 7 7 hours..." 8 Right? 9 A. That's right. 10 Q. "However, paraquat penetrated the trooper 11 boot material within 0.25 hours." 12 A. That's right. 13 Q. "The subsequent steady [...] absorption 14 rates were not proportional to the applied 15 concentration." 16 And then they concluded: 17 "It is possible that the neat formulation 18 altered the structure of the trooper boot material, 19 enhancing the rate of paraquat penetration." 20 Right? 21 A. That's what it says. 22 Q. These authors determined that paraquat 23 could have altered the boot, which would have allowed 24 more penetration, essentially? 25 A. My interpretation of this is that that is
384 1 pesticides. But not exclusively so; they are, you 2 know, common workwear that can be used in various 3 situations. 4 Q. Common workwear that's used with paraquat 5 application, correct? 6 A. I don't know whether these were both used 7 with paraquat applications. That's a possibility. 8 Q. It certainly wouldn't be out of the 9 ordinary to hear somebody was wearing Wellington or 10 trooper boots while spraying paraquat, right? 11 A. Again, that's not -- well, outside of my 12 area of expertise. I can't comment on whether this 13 was -- whether these were used routinely, rarely, or 14 never. 15 Q. Now, page 2, once again there is an 16 introduction that provides the purpose, and the 17 purpose of this study was: 18 "To provide information for hazard 19 assessments, [and] the permeation of paraquat through 20 trooper boots and Wellington boots was measured from 21 a Gramoxone formulation..." 22 Right? 23 A. Yes. 24 Q. And, once again, looking at the rate of 25 absorption and the breakthrough time?	386 1 a hypothesis. I don't think they actually tested 2 whether that happened in practice. 3 Q. At any point in time, did Syngenta warn 4 any paraquat users or farmers in the United States to 5 wear polyethylene-coated Tyvek while spraying? 6 MR. NARESH: Objection to foundation and 7 the scope. 8 THE WITNESS: I'm, again, not able to 9 comment on that. I would need to see documents to 10 show one way or the other. 11 BY MR. DICKENS: 12 Q. Do you know whether or not Syngenta ever 13 instructed or warned users to wear Wellington boots 14 while applying paraquat? 15 MR. NARESH: Same objections. 16 THE WITNESS: And same answer: I would 17 need to see what evidence the documents show as to 18 what advice was given. 19 MR. DICKENS: Mark 58 for the record. 20 (Exhibit 58 marked for identification.) 21 MR. NARESH: What's the topic number on 22 this one, please? 23 MR. DICKENS: There is no topic number. 24 It's just the only label I have. 25 ///

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387 1 BY MR. DICKENS: 2 Q. Dr. Botham, what I've handed you is a 3 document, which is a label from September 13, 1993 for 4 Gramoxone Extra herbicide in the United States. 5 Do you see that? 6 MR. NARESH: I'll object to the 7 characterization. I think this is a description of 8 the label, not an actual label. 9 THE WITNESS: Yes. I mean, this is not an 10 area of expertise, so I'm not sure what the status of 11 this is as to whether it's a label or something which 12 goes with a label. 13 BY MR. DICKENS: 14 Q. Okay. That's all right. But if we can 15 turn to page ending 5578, there's some precautionary 16 statements that are listed, right? 17 A. Yes. 18 Q. And the precautionary statements that are 19 included here are similar to what you've seen in your 20 review of paraquat labels in the United States, right? 21 A. I mean, I have not extensively reviewed 22 labels in the United States, as I indicated before, so 23 this -- yes, this looks like the kind of information 24 that I would have expected to see on a label. 25 Q. Okay. This, in 1993, is roughly six,	389 1 MR. NARESH: Object to scope and 2 foundation. 3 THE WITNESS: It would. 4 BY MR. DICKENS: 5 Q. Now, as we looked at in 1986, the Syngenta 6 individuals who conducted this study indicated that 7 unfinished cotton should not be recommended, right? 8 MR. NARESH: No, hang on. Let me -- well, 9 I'll just object to the form and foundation on that. 10 THE WITNESS: Yes, that's what the 1987 11 report for the Malaysia said, certainly. 12 BY MR. DICKENS: 13 Q. Roughly seven years before this, right? 14 A. Right. But I would note, however, that in 15 this document we're now looking at, it also recommends 16 a waterproof apron, and so it's not just simply being 17 reliant on the shirt. 18 Q. Okay. And that's for the pouring, loading 19 and mixing, right? 20 A. Correct. 21 Q. Now, underneath there, they're spraying 22 the end-use dilution, right? 23 A. Yes. 24 Q. And that includes the same protective 25 clothing: disposable suit/coveralls or long-sleeved
388 1 seven years after those two studies in the penetration 2 of PPE that we looked at? 3 A. Yes, that's right. 4 Q. It states: 5 "When pouring, loading, mixing concentrate 6 or when exposure to concentrate is possible, wear..." 7 It lists: 8 "Protective clothing (disposable 9 suit/coveralls or long-sleeved shirt and pants)." 10 Right? 11 A. Yes. 12 Q. And that could include unfinished cotton 13 long-sleeved shirts or pants, right? 14 A. I don't know what that could include. 15 Q. Well, you have an understanding -- well, 16 there's no description as to what type of long-sleeved 17 shirt or pants to wear, right? 18 A. It doesn't describe that, and it says 19 "disposable suit." Again, I'm not sure what "suit" 20 is. 21 Q. So you would agree that if someone wore 22 a long-sleeved pants and shirt made of unfinished 23 cotton, that would be consistent with the labeling 24 information for Gramoxone being sold in the United 25 States, right?	390 1 shirt and pants. 2 Right? 3 A. Yes. 4 Q. This one does not include any type of 5 apron, right? 6 A. It does not, no. 7 Q. Just waterproof footwear, wide-brimmed 8 hat, protective clothing, including disposable 9 suit/coveralls or long-sleeved shirt and pants. 10 Right? 11 A. Correct. 12 Q. And once again, there's nothing here to 13 indicate to users or farmers that they should not be 14 wearing unfinished cotton, long-sleeved shirts or 15 pants? 16 MR. NARESH: Objection; scope, foundation. 17 THE WITNESS: No, it does not specify 18 that. 19 BY MR. DICKENS: 20 Q. And there's nothing here that instructs 21 users or sprayers of paraquat to wear 22 polyethylene-coated Tyvek, does it? 23 MR. NARESH: Same objections. 24 THE WITNESS: It does not specify, no. 25 MR. DICKENS: You can put that aside.

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391 1 BY MR. DICKENS: 2 Q. Sir, in your notes you prepared, 3 Exhibit 1, specifically tab 4, on the second page you 4 note a timeline for approved respirator, right? 5 A. Yes. 6 Q. And based on your review, it's fair to say 7 that a approved -- well, first of all, what's a 8 respirator? 9 A. It's a -- essentially, it's a more 10 sophisticated respiratory protection than a mask would 11 be; so it allows the air to be properly filtered. 12 Q. Does that include or does that require any 13 type of cartridge to filter out particles or dust in 14 any way? 15 A. Again, outside of my area of expertise, 16 but a respirator would normally have something of that 17 sort, which is what I described as a filter. 18 Q. So a respirator was added to the labelling 19 in the United States in 1991? 20 A. That's right. 21 Q. It was then removed in 1998 and 1999, 22 correct? 23 A. For the reasons given here, yes, that the 24 hazard from ex- -- or the likelihood of exposure by 25 that route was deemed to be low.	393 1 history of that is telling us, yes. 2 MR. DICKENS: I'll hand you 59 for the 3 record. 4 (Exhibit 59 marked for identification.) 5 MR. NARESH: What's the topic number, 6 please? 7 MR. DICKENS: Topic 23. 8 BY MR. DICKENS: 9 Q. Topic 23 [sic] is an "Investigation into 10 the incidents of nose bleeding on a paraquat plant," 11 December 10, 1968, right? 12 A. Yes. So, just to be clear, we've now 13 switched gear from using paraquat in the field to 14 a manufacturing plant. 15 Q. Correct. This is a plant where, at this 16 time, ICI employees were working, right? 17 A. Yes. 18 Q. So these are actual employees of 19 the company, correct? 20 A. They probably were, yes. 21 Q. If we can turn to the second page, at the 22 bottom. 23 Now, this investigation was undertaken 24 specifically because nosebleeds were being seen within 25 the manufacturing plant, right?
392 1 Q. And then it was added back to the label 2 again in 2001, right? 3 A. It was, yes. 4 Q. And that was shortly after we looked at 5 that memorandum from the EPA from Dr. Blundell [sic], 6 correct? 7 A. Yes. 8 Q. And this was shortly thereafter, right? 9 A. Yes. And, again, this is a re-evaluation, 10 if you wish, of what was actually happening in the 11 field. So the fact that nosebleeds were being seen, 12 for example, suggested that it might be prudent to 13 bring that requirement back. 14 Q. Nosebleeds were being seen in the field 15 from the 1960s, though, correct? 16 A. Yes. 17 Q. There was no respirator or mask that was 18 required to be worn on the labeling for paraquat until 19 1991? 20 A. Well, that's my understanding from the 21 information that I was given, yes. 22 Q. So a little under 30 years after the 23 product was on the market in the United States? 24 MR. NARESH: Object to the form. 25 THE WITNESS: That's the -- what the	394 1 A. That's right. 2 Q. Okay. And "On a few occasions, persons 3 have suffered nosebleeds after being in a zone..." 4 where they were wearing FiltaSafe or an air-fed mask 5 all the time? 6 Correct? 7 A. Correct. 8 Q. Now, these FiltaSafe masks, these included 9 filter pads, right? 10 A. Again, outside my area of expertise, but 11 the name "FiltaSafe" would suggest that there was a 12 filter. 13 Q. Okay. And even individuals who were 14 wearing the mask with the filter were experiencing 15 nosebleeds? 16 A. Yes, and it goes on to say further down, 17 there may be explanations around that as to those 18 masks becoming contaminated. 19 Q. And that includes that those individuals 20 either wore a contaminated mask or a mask that was 21 removed temporarily, left in a contaminated zone and 22 then replaced. 23 Right? 24 A. Yeah, and this is very reminiscent of the 25 recent experience with mask-wearing in Covid, that

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395 1 you've got to have -- make sure that you wear a mask 2 appropriately and you don't, you know, accidentally 3 contaminate it. So this was actually reinforcing that 4 when masks are used, they have to be used 5 appropriately and not left in a place where they could 6 become contaminated or that they should be changed if 7 they are dirty. 8 Q. But the employees for Syngenta, at this 9 point, were unknowingly contaminating their masks, 10 which resulted in exposure causing nosebleeds, right? 11 A. These individuals on the plant obviously 12 needed to be reminded about the best practice of how 13 to use masks. 14 Q. Now, that best practice in how to wear 15 masks, had the users or sprayers of paraquat ever been 16 instructed by Syngenta on the best way to wear masks? 17 MR. NARESH: Objection; foundation, scope. 18 THE WITNESS: Okay, so we're now switching 19 back into the field. 20 BY MR. DICKENS: 21 Q. Correct. 22 A. And, again, the specifics of what -- 23 (Test fire alarm system sounded.) 24 MR. DICKENS: Why don't we go off the 25 record.	397 1 kept -- as part of their licensing requirements, 2 properly trained in the use of personal protective 3 equipment. 4 Q. Okay. There was a system put in place by 5 Syngenta whereby all FiltaSafe masks were to be 6 returned decontaminated and having filter pads 7 replaced, and expected to clean and change their 8 filter pads daily, right? 9 A. And, for the record, you're now switching 10 back into the document about manufacture. So, yes, 11 that's what that says. 12 Q. Okay. And that's what the employees were 13 instructed to do, correct? 14 A. Yes. 15 Q. Do you know whether or not the United 16 States label instructed farmers or other users of 17 paraquat to ever wear a mask that contained a filter 18 pad? 19 A. Again, the level of detail is beyond my 20 level of expertise, so we're talking about -- we were 21 talking before about NIOSH-approved respirators. My 22 assumption is, as we said before, that they indeed may 23 have contained a filter. 24 Q. You did undertake a review, however, of 25 the NIOSH-approved respirators on the labeling in the
396 1 THE VIDEOGRAPHER: We are going off the 2 record at 10 o'clock. 3 (Off the record.) 4 THE VIDEOGRAPHER: We are back on the 5 record at 10:01. 6 BY MR. DICKENS: 7 Q. Dr. Botham, you mentioned that the 8 individuals at the plant for paraquat needed to be 9 reminded about the best practice of how to use masks. 10 And so my question turned to those who were actually 11 using paraquat out in the field, the farmers. 12 Were they ever instructed by paraquat 13 [sic] as to proper measures on how to wear a mask? 14 MR. NARESH: And I'll object again to the 15 scope and the foundation. 16 THE WITNESS: Again, outside my area of 17 expertise, but, broadly, I can say that I know that 18 there was always a constant process of making sure 19 that farmers were either reminded or trained about how 20 to use personal protective equipment and what best 21 practice actually meant. 22 BY MR. DICKENS: 23 Q. By Syngenta, that training? 24 A. Including by Syngenta. I mean, this is 25 industry practice that farmers and growers should be	398 1 United States? 2 A. I didn't undertake a review to the extent 3 that I asked about the detail of what that respirator 4 looked like, how it was used, and so on. This is 5 simply to document when such a respirator was added or 6 removed from the label. 7 MR. DICKENS: Okay. We can put that 8 aside. 9 We've been going an hour. Do you want to 10 take a break now? 11 MR. NARESH: Yeah, let's do it. 12 MR. DICKENS: All right. 13 THE VIDEOGRAPHER: We are going off the 14 record at 10:04. 15 (Break taken.) 16 THE VIDEOGRAPHER: We are back on the 17 record at 10:20. 18 MR. DICKENS: Dr. Botham, I'm going to 19 hand you Exhibit 60 for the record. 20 (Exhibit 60 marked for identification.) 21 MR. DICKENS: Topic 22 in the Notice of 22 Deposition. 23 This exhibit is a document produced by 24 Syngenta in the litigation, "Myths versus Facts: 25 Setting the Record Straight."

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399 1 BY MR. DICKENS: 2 Q. This is a document you've seen before, 3 Dr. Botham? 4 A. Yes, I saw it during preparation. 5 Q. Okay. And this is a marketing brochure 6 issued by Syngenta; is that your understanding? 7 A. I think that's correct. 8 Q. And this is specifically for Gramoxone 9 Super, right? 10 A. That's right. 11 Q. And, as a brochure, this would have been 12 a document that would have been circulated to 13 distributors and end users, farmers, who were spraying 14 paraquat; is that your understanding? 15 A. I don't know exactly to whom it went, but 16 I guess that would be the kind of person who might be 17 customers of this. 18 Q. And on the first page, it includes "Myths" 19 and says: 20 "Myths are untrue statements that usually 21 arise from misunderstandings or misinterpretations of 22 facts." 23 And that's what's represented here by 24 Syngenta; is that right? 25 A. That's right.	401 1 "Paraquat was recently developed by the US 2 government to spray on marijuana in an effort to deter 3 the illegal use of the plant." 4 Right? 5 A. That's right, yes. 6 Q. And we saw earlier in your testimony, in 7 the statement by Michael Rose to the United States 8 Government, he was discussing use of paraquat on 9 marijuana, right? 10 A. Yes, he was. 11 Q. And that was in the mid-to-late '80s, 12 right? 13 A. Yes. 14 Q. If we can turn to the page ending 2798. 15 One of the myths: 16 "Gramoxone Super causes Parkinson's 17 disease." 18 Do you see that? 19 A. I do. 20 Q. And that was something that was being 21 discussed publicly in the late 1980s, right? 22 A. Yes. 23 Q. And Syngenta informs farmers and others 24 that there is absolutely no scientific evidence that 25 Gramoxone Super can cause Parkinson's disease, right?
400 1 Q. And then on the next pages, it includes 2 some myths and then the facts as Syngenta sees them, 3 right? 4 A. Yes. 5 Q. Okay. 6 MR. NARESH: Have you established the year 7 of this, sorry? 8 MR. DICKENS: My understanding is that it 9 is 1986. 10 MR. TRAVERS: Or '87, maybe. 11 MR. NARESH: Okay, thank you. Well, I'll 12 take your representation on that. 13 Unless you know? 14 THE WITNESS: I don't know, no. I think 15 I did remember asking that question myself and 16 I didn't get an answer to that. 17 BY MR. DICKENS: 18 Q. Okay. As you just mentioned, Doctor, you 19 attempted to determine the date; is that right? 20 A. Yes. 21 Q. Okay. And do you know when Gramoxone 22 Super was on the market in the United States? 23 A. No, I don't have specific dates for that. 24 Q. Okay. It does say for one of the myths 25 that:	402 1 A. It was true then as much as it's true 2 today. 3 Q. So your position today remains the same: 4 There is no scientific evidence that Gramoxone Super 5 can cause Parkinson's disease? 6 A. We put it slightly differently, that the 7 weight of evidence suggests that there is no causative 8 link between paraquat exposure and Parkinson's 9 disease. 10 Q. You agree there is currently some 11 scientific evidence that Gramoxone Super can cause 12 Parkinson's disease, right? 13 A. As in many issues of this sort, you will 14 find scientific evidence which leans more in one 15 direction or another, but we're talking about the 16 overall weight of evidence. And it's also that same 17 weight of evidence analysis that's been done by the 18 US EPA to come to the same conclusion. 19 Q. Now, have you ever issued a Syngenta 20 brochure or marketing statement to users or farmers to 21 indicate that, "There is some scientific evidence 22 Gramoxone Super can cause Parkinson's disease but we 23 don't believe so based on weight of the evidence"? 24 A. I'm not -- I've not seen such a document, 25 no.

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403 1 Q. Do you have an understanding that the 2 US EPA's review of paraquat is still ongoing? 3 A. I mean, the US EPA has reviewed paraquat 4 almost on an ongoing basis since the 1980s, so, yes, 5 there is current -- there is currently another review 6 ongoing. 7 Q. Including an ongoing review of the 8 evidence with respect to Parkinson's disease? 9 A. That's part of their review. 10 Q. Next myth: 11 "Breathing spray mists of Gramoxone Super 12 will cause lung damage." 13 It states: 14 "In fact, there have been no substantiated 15 cases of systemic poisoning or death from inhaling 16 spray mists containing paraquat." 17 Do you see that? 18 A. Yeah, that's what it says. 19 Q. And we saw yesterday there were reports, 20 and we looked at the one from Ireland of an individual 21 who was -- died from what the coroner determined was 22 inhalation of paraquat, right? 23 A. We did. But what I don't know about this 24 statement, or indeed some of the others, is, if you 25 wish, what evidence base was being used to make these	405 1 Q. Okay. But, nonetheless, it is meant to 2 provide users of paraquat with safety information, 3 correct? 4 A. It's meant not to give -- it's not like an 5 alternative to a label or a safety datasheet. It is 6 purely to give some headline messages to dispel myths 7 and to hopefully give facts as they were perceived or 8 known at the time. 9 Q. Okay. Including -- well, strike that. 10 Nothing in this document tells the reader 11 that it is not meant to provide safety information in 12 lieu of the labeling, does it? 13 A. No. I'm saying that this was not, as I 14 understand it, the intention, to be a replacement for 15 the label. The labels and the information about 16 safety and precautions were still the most important 17 documents. This was because there -- clearly, media 18 and other outlets were perhaps giving farmers and 19 growers an incorrect perception about the safety of 20 paraquat. 21 Q. So the readers were supposed to know that 22 this information is merely supplementing what's 23 included in the labeling as to toxicity? 24 A. I mean, I don't know exactly how this was 25 positioned, but I would have anticipated that this
404 1 statements. 2 What I did ask in my preparation is 3 whether there was anybody from Product Safety that was 4 involved in this document. I don't believe that was 5 the case. I don't know who actually wrote this 6 document. 7 Q. Okay. This document, though, I mean it is 8 a marketing document, right? 9 A. Indeed, yeah. 10 Q. And it's a marketing document that is 11 meant to provide facts about the toxicity of 12 Gramoxone, right? 13 A. About the safety of it, yeah. 14 Q. Yeah. And, in fact, on the page we were 15 looking at, right above "Gramoxone Super causes 16 Parkinson's disease," it says: 17 "Myths about the toxicity of Gramoxone..." 18 A. It does. 19 Q. And it's your understanding from your 20 review of this document that it's a marketing document 21 and individuals from Product Safety were not involved, 22 right? 23 A. We don't believe that was the case. I 24 mean, we didn't do an extensive search on that but 25 I did ask that question.	406 1 was not meant to be a replacement for the normal means 2 of communicating on safety. 3 Q. And so, therefore, the Product Safety 4 people at ICI or Syngenta were not involved in coming 5 up with the terms or evaluating this document for 6 accuracy, right? 7 A. I don't know for sure. As I said, I asked 8 the question and I'd not received any evidence that we 9 were -- or that Product Safety was involved. 10 Q. If we can turn to the page ending 2800, 11 under "Myth": 12 "Gramoxone Super always requires special 13 clothing to protect workers from exposure." 14 Right? 15 A. Yes. 16 Q. That's one of the myths that Syngenta is 17 informing the end users and farmers as to whether or 18 not they need to wear protective clothing? 19 A. But that headline is then given -- the 20 "Fact" is then actually giving more detail underneath 21 that as to what that actually means in practice and 22 that's more familiar, more similar to what we've been 23 discussing with regard to what's on the label. 24 Q. Okay. So: 25 "After mixing, [...], diluted Gramoxone

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407 1 Super poses no serious risk to spray operators as a 2 result of absorption through skin, although prolonged 3 contact with skin can lead to irritation." 4 Right? 5 A. Yes. 6 Q. So farmers and other end users are 7 instructing -- or instructed that they have no serious 8 risk of being exposed to the diluted Gramoxone Super, 9 right? 10 MR. NARESH: I'll object on the rule of 11 completeness grounds. 12 THE WITNESS: I think that's going one 13 step too far. I mean, what this says is that in 14 addition to the other good practice which we were 15 talking about earlier in terms of farmer training, the 16 risk of exposure is also down to how they apply it; 17 it's not just about what -- the clothing that they're 18 making -- that they're wearing. 19 BY MR. DICKENS: 20 Q. None of that is said in this particular 21 Fact section. It says: 22 "... poses no serious risk to spray 23 operators as a result of absorption through skin." 24 Right? 25 MR. NARESH: Well, again, rule of	409 1 BY MR. DICKENS: 2 Q. Okay. It states: 3 "Once mixed, only waterproof footwear and 4 work clothing need be worn." 5 Right? 6 A. That's what it says, yes. 7 Q. And that's what we had discussed earlier, 8 is work clothing could be any type of long-sleeved 9 shirt or long pants, right? 10 A. That is a possibility. I don't know 11 exactly whether further detail was -- or 12 recommendations were given to farmers. 13 Q. And that would include unfinished cotton, 14 right? 15 A. It's possible. I can't -- can neither say 16 yes or no to that. 17 Q. There's a Myth: 18 "Paraquat accumulates in the body." 19 It says: 20 "... it is not stored or accumulated in 21 body fat." 22 A. Excuse me, where are you now looking? 23 Q. Oh, sorry, right underneath that. That 24 last one we were looking at. 25 A. Okay, right, yeah. Thank you.
408 1 completeness. 2 THE WITNESS: That's what that says here. 3 BY MR. DICKENS: 4 Q. And at this point in time, as we 5 discussed, there had been no long-term neurotoxicity 6 studies that had been done with paraquat? 7 A. Even that is -- excuse me. That's not 8 entirely true. So, again, we need a date for this, 9 but there had been, by that time, a number of 10 long-term toxicity studies, which would have included 11 assessments on the central nervous system. 12 Q. No long-term study specifically measuring 13 neurotoxicity? 14 A. Long-term studies that would have been 15 done to guidelines would always have included an 16 assessment of, for example, clinical observations and 17 pathology, which are an assessment of the nervous 18 system. 19 Q. Did you review or see any evidence that 20 the EPA would have approved this brochure or marketing 21 document? 22 A. I -- 23 MR. NARESH: Objection; scope, foundation. 24 THE WITNESS: Yeah. No, I have not seen 25 any evidence of that.	410 1 Q. "Paraquat that may have been absorbed in 2 the blood is rapidly and effectively eliminated in the 3 urine by the kidneys." 4 Do you see that? 5 A. I do. 6 Q. And then I want to turn to the final page. 7 The final Myth here: 8 "The long-term health hazards from 9 Gramoxone Super are not fully understood." 10 And that's a myth, right? 11 A. That's described as a myth, yes. 12 Q. It's described as a myth; therefore, the 13 reader would take it as "the long-term health hazards 14 from Gramoxone Super are fully understood," right? 15 That's a fact. 16 MR. NARESH: I'll object to the form and 17 the foundation. 18 THE WITNESS: And that would be based on 19 what I've just said: that, by this time, we don't have 20 an exact date, but extensive safety testing had been 21 done on paraquat. 22 BY MR. DICKENS: 23 Q. So Syngenta's position in 1983 was that 24 they fully understood the long-term health hazards 25 from Gramoxone?

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411 1 A. As much as they could from the toxicology 2 studies and other safety studies that had been done. 3 Q. There was no long-term health hazard in 4 1983 that Syngenta did not fully understand at that 5 point in time? 6 MR. NARESH: Object; asked and answered, 7 form. 8 THE WITNESS: There are always potential 9 health hazards, at any time, that you could argue have 10 not been fully addressed. Toxicology does not 11 necessarily allow you to predict every possible 12 adverse health outcome. It does -- it is designed to 13 determine whether there's any risk from those kinds of 14 health hazards that can be predicted by animal models. 15 BY MR. DICKENS: 16 Q. And by this point in time, in 1986/1987, 17 countries had already banned the use of paraquat, 18 right? 19 MR. NARESH: Objection; foundation, form. 20 THE WITNESS: Well, again, I don't have 21 the dates immediately to hand. I've got the list of 22 countries that we were talking about yesterday, but 23 I don't have dates against those. 24 BY MR. DICKENS: 25 Q. You understand Sweden initially banned	413 1 Q. And is this, once again, a document that 2 was prepared by the marketing division within ICI or 3 Syngenta? 4 A. Again, I can't tell you exactly who was 5 involved in this. The list of references that are 6 included would suggest that there was certainly some 7 consultation with regulatory and potentially safety 8 experts as well. 9 Q. Okay. If you can turn to the third page, 10 ending in 3269, there's a picture in the column. It's 11 the second picture from the right, and it says: 12 "Gramoxone application before planting 13 crop beans." 14 Right? 15 A. Yes. 16 Q. And it shows an individual spraying 17 paraquat, right? 18 A. It's a very small picture, so it's hard to 19 see exactly what that person is doing. 20 Q. Okay. But it's represented as "Gramoxone 21 application before planting." 22 Right? 23 A. Yeah, I mean, that's what the caption 24 says. 25 Q. So the caption is meant to represent
412 1 paraquat in 1983? 2 A. I'm not sure whether that's correct, but 3 you may be right. 4 Q. Do you understand that part of the reason 5 Sweden banned paraquat was because of concern of 6 long-term health hazards associated with paraquat? 7 A. I think we saw earlier that there were 8 some concerns that Sweden were raising, but I don't -- 9 I didn't realize -- didn't know that was in 1983. 10 But certainly Sweden continued to have those concerns. 11 MR. DICKENS: Go ahead and mark 12 Exhibit 61. 13 (Exhibit 61 marked for identification.) 14 BY MR. DICKENS: 15 Q. Dr. Botham, I've handed you a document. 16 This is a "Gramoxone Information Bulletin." This one, 17 on the last page, appears to have a copyright date of 18 1983. 19 Do you see that? 20 A. Yes, this is definitely 1983. 21 Q. And this is an information brochure, once 22 again, provided to farmers and other users of 23 paraquat? 24 A. Yes, I believe so. This is a commercial 25 information bulletin.	414 1 someone spraying paraquat? 2 A. That's right. 3 Q. You'd agree that this person's not 4 spraying paraquat in accordance with the labeling on 5 paraquat as of 1983? 6 A. No, I don't know that's the case. This is 7 far too small a picture for me to see exactly what's 8 going on here. 9 Q. You can see he's wearing short sleeves? 10 A. Probably, yes. I -- yes. 11 Q. Do you know whether or not the labeling 12 for paraquat has ever instructed users to not wear 13 long sleeves while spraying? 14 MR. NARESH: I'll object to the scope and 15 the foundation. 16 Are you asking that question worldwide for 17 all time? 18 MR. DICKENS: In the United States. 19 MR. NARESH: Is this a picture of the 20 United States? 21 BY MR. DICKENS: 22 Q. Well, let me ask this: When it says 23 "Herbicides in the Americas," do you know where this 24 information bulletin was distributed to? 25 A. No, I have no idea. I mean, it's produced

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415 1 in the United Kingdom, so that much I do know. 2 Whether it was meant to have global readership or just 3 European readership, I am not sure. 4 Q. Okay. And under Contents, it uses 5 "Principal uses in the Americas." 6 Do you see that on the first page, left 7 column? 8 A. First page? 9 Q. Yes. On the far left, there's Contents 10 and it gives some introduction, product, and then 11 "Principal uses..." -- 12 A. Oh, "Principal uses in the Americas," 13 yes, indeed, right. Mmm-hmm. 14 Q. Right. So you don't know whether or not 15 this was distributed to users/farmers in the United 16 States? 17 A. I don't know, no. 18 Q. The individual in the picture doesn't 19 appear to be wearing gloves, correct? 20 A. Well, I would need a magnifying glass to 21 confirm that. 22 Q. So you can't tell? 23 A. Well, you may have better eyesight than 24 me. 25 Q. That's fine. I'm just asking if you can	417 1 the last sentence there: 2 "... there is no health hazard associated 3 with the normal use of paraquat." 4 Right? 5 A. There were no health -- adverse health 6 effects seen in this -- in that particular study. 7 Q. There had been health hazard effects seen 8 in other studies analyzing paraquat, right? 9 A. We've seen that over the last couple of 10 days. Of course, there are situations where people 11 have experienced skin irritation and nosebleeds, yes. 12 Q. Has an information bulletin or marketing 13 brochure been issued by ICI or Syngenta to users in 14 the United States informing them of epidemiological 15 studies that have found health hazards associated with 16 the normal use of paraquat? 17 A. I can't comment on that. I don't know 18 what's been provided. 19 Q. The section on the far right, "Handling 20 spray strength dilutions." 21 Do you see that? 22 A. Yes. 23 Q. It states: 24 "... Gramoxone does not cause [...] injury 25 to healthy skin (though prolonged exposure should be
416 1 tell or not. If not, that's fine. 2 A. I can't tell. 3 Q. Okay. 4 Now if we can turn to the page ending in 5 93271. 6 And it is very small. There is a section, 7 "Safety to human health." 8 Do you see that? 9 A. Yes, I do. 10 Q. The second paragraph cites to an 11 epidemiological study of spray workers in Malaysia. 12 Do you see that? 13 A. Yes. So that would be the Howard, et al., 14 paper. 15 Q. And it's cited and meant to indicate that 16 there are no health hazards to individuals spraying or 17 applying Gramoxone, right? 18 MR. NARESH: I object to that; form. 19 THE WITNESS: So this was one of the 20 studies we discussed yesterday with regards to studies 21 that had been done, and this was a study which 22 included an assessment of the health as well as the 23 exposure of workers, in this case, in Malaysia. 24 BY MR. DICKENS: 25 Q. Okay. And it specifically is cited, from	418 1 avoided)." 2 And do you agree that diluted paraquat or 3 Gramoxone is not a skin irritant? 4 A. It would normally not cause the kind of 5 effects that you would see with concentrated 6 Gramoxone, certainly. 7 Q. Okay. And understanding it wouldn't cause 8 the same effects as concentrated, do you believe that 9 diluted Gramoxone is not a skin irritant in any way? 10 A. Well, it depends how you measure that. 11 You can look at what the toxicology studies that 12 have been done say, but then you also have to look at 13 what happens in practice in humans; so I think it's 14 broadly true that in humans with intact skin, who 15 don't let even diluted paraquat stay on their skin for 16 a prolonged time, would not normally expect to have 17 skin damage. 18 Q. In the toxicology studies, there was skin 19 damage, right? 20 A. Because they -- toxicology studies often 21 give exaggerated exposure, yes. 22 Q. And Syngenta is not aware of any situation 23 where an individual who got diluted Gramoxone on their 24 skin has experienced skin irritation or skin problems? 25 MR. NARESH: I'll object to the form of

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419 1 that, and the foundation and the scope. 2 THE WITNESS: Again, I think that we've 3 probably said -- discussed this before. If -- those 4 kind of things do happen, especially when the 5 individual has found themselves exposed to the 6 formulation for a prolonged period of time, maybe 7 because they've soaked their clothing, for example. 8 BY MR. DICKENS: 9 Q. Some answers to Frequently Asked Questions 10 on the page ending in 3272. 11 A. Yeah. 12 Q. One of them: 13 "Is Gramoxone really safe in use?" 14 The answer: 15 "Yes, certainly." 16 And then goes on to describe the product's 17 been used around the world for more than two decades. 18 Do you see that? 19 A. Yes. 20 Q. And that's what was being told to farmers 21 and users in 1983, right? 22 A. It was. 23 Q. You can put that aside. 24 I do want to go back to something you said 25 yesterday and see if I understand, and so I want to	421 1 sold for residential use from the time it was approved 2 in the United States in the '60s through 1986? 3 A. This is the history from 1986. 4 Q. Now, there was a relationship between ICI 5 and Chevron from the time paraquat was introduced in 6 the United States in the '60s up until 1986, right? 7 A. Yes. 8 Q. And Chevron was responsible for the 9 marketing and sale within the United States? 10 A. Yeah. 11 Q. And ICI was responsible for the 12 manufacture? 13 A. Yes, that's right. 14 Q. And, as we saw, there was some 15 back-and-forth in that time frame with respect to 16 marketing documents and labeling, right? 17 A. Yes, that's right. 18 MR. DICKENS: I'll hand you what we'll 19 mark as Exhibit 62, which is topic 108. 20 (Exhibit 62 marked for identification.) 21 MR. NARESH: And can I have a standing 22 objection as to the foundation with respect to this 23 document -- 24 MR. DICKENS: You can. 25 MR. NARESH: -- and questions regarding
420 1 look at Exhibit 1, which are your notes, and tab 3. 2 Now, I believe you said yesterday that 3 Syngenta never sold a residential -- or paraquat for 4 residential use in the United States; is that right? 5 A. What I was told is that there was 6 a registration for residential use but that we never 7 sold paraquat for residential use. That was the 8 information I was given. 9 Q. Okay. And what I wanted to clarify to 10 make sure I understand is, in your notes here, you 11 note that Chevron transferred a product registration 12 for residential use to Syngenta in 1986, right? 13 A. Yes. 14 Q. And then you go on to say: 15 "Syngenta never produced or sold the 16 product in the United States for residential use." 17 A. Yes. 18 Q. Do you know whether Chevron sold paraquat 19 for residential use prior to 1986? 20 A. I'm not able to speak on behalf of the 21 Chevron marketing, no. 22 Q. So when you say Syngenta never produced or 23 sold, you're talking from 1986 forward, right? 24 A. That's the information that I was given. 25 Q. So you don't know whether or not it was	422 1 the document? 2 MR. DICKENS: Your standing objection is 3 noted. 4 BY MR. DICKENS: 5 Q. Dr. Botham, I have handed you a document 6 titled "Evaluating paraquat's position in the 7 herbicide business." It's a proposal by a McKinsey 8 & Company, dated November 22, 1985, right? 9 A. That's what it says, yes. 10 Q. And this particular proposal was to 11 Chevron Chemical as well as ICI Americas, Inc., 12 correct? 13 A. That's right. 14 Q. ICI Americas, Inc. was associated with 15 ICI? 16 A. It was the American company for ICI. 17 Q. It was the company responsible for 18 paraquat in the United States? 19 A. Yes. 20 Q. And this is a document you reviewed in 21 preparation for today's deposition? 22 A. Yes, we looked at this. 23 Q. And this document, once again, it's your 24 understanding this is a proposal submitted to both ICI 25 and Chevron?

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423 1 A. Well, that's what this suggests, 2 certainly, yes. 3 Q. And you understand both ICI and Chevron 4 participated with McKinsey in generating information 5 for both the proposal and what later became a final 6 report, right? 7 A. I don't know what -- who was involved in 8 providing the information to McKinsey. I have just 9 read the report. 10 Q. Now, first I'll turn your attention to the 11 page ending 11485. 12 Right? 13 A. Yes. 14 Q. It is "Objectives": 15 "The project would have two specific 16 objectives..." 17 And it gives Chevron's perspective and it 18 gives an ICI perspective, right? 19 A. That's correct. 20 Q. Okay. And ICI's perspective includes that 21 Chevron's marketing performance was inadequate. 22 Right? 23 A. That's what it says. 24 Q. Now, do you understand this is information 25 that ICI would have provided to McKinsey at the time	425 1 Q. And, indeed, that relationship ended 2 within a year of this proposal, roughly? 3 A. Well, there was a change in who was then 4 responsible for marketing paraquat. I mean, I don't 5 know any detail about the relationships in -- other 6 than what I've read in a few documents. 7 Q. Okay. Proposal: 8 "Paraquat has been an attractive product 9 for both ICI America and Chevron." 10 With sales of 60 million to 70 million 11 annually in the 1980s, right? 12 A. Yes. 13 Q. And that represented high profitability? 14 A. Yes. 15 Q. And, indeed, paraquat was one of the most 16 profitable compounds for ICI throughout the 1980s and 17 1990s, right? 18 MR. NARESH: Scope, foundation. 19 THE WITNESS: I mean, I'm not a commercial 20 person, so I'm not able to talk about profitability 21 and relative profitability. 22 BY MR. DICKENS: 23 Q. Turn to 11475. 24 It notes: 25 "There are serious disagreements between
424 1 of the initial proposal? 2 A. That's an assumption. As I said, I don't 3 know who gave McKinsey the information. 4 Q. Okay. Let's turn to 11493. And in the 5 proposal, there's some suggested staffing in order to 6 generate a final report, right? 7 A. Yes. That was what I understood this was 8 meant to be, yeah. 9 Q. And that staffing includes individuals 10 from McKinsey, Chevron and ICI America, right? 11 A. Yes. 12 Q. And your understanding is that this 13 proposal was accepted and a final report was indeed 14 generated, right? 15 A. That's right, there was a report. 16 Q. And you reviewed that report in 17 preparation for today's deposition? 18 A. That was in my material, yes. 19 Q. Now -- sorry. Back to the first real 20 page, ending 11467. It notes: 21 "As we understand it, paraquat's recent 22 performance has led to tension in the ICI Americas and 23 Chevron Chemical relationship." 24 Correct? 25 A. Yes.	426 1 ICI and Chevron as to how to best manage the 2 business." 3 Right? 4 A. Yes. 5 Q. Chevron's perspective: Paraquat was 6 "increasingly difficult to market." 7 That's what it says, right? 8 A. That's what it says, yes. 9 Q. Part of that is because of high 10 environmental risk, right? 11 A. And it doesn't define what it meant by 12 that. 13 Q. Do you have an understanding of what is 14 meant by that? 15 A. No, I don't know whether it's to do with 16 toxicology or whether it's to do with, literally, risk 17 to the environment. I'm not clear what the 18 specific -- or specific issues may have been there. 19 Q. Okay. If you can turn to the next page, 20 it says: 21 "Paraquat's toxicity is high relative to 22 competitors'." 23 Right? 24 A. Yeah. This is certainly about the 25 toxicity.

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427 1 Q. Okay. "Relative toxicity," paraquat and 2 then some of the competitors on the market at 3 the time, right? 4 A. Correct. 5 Q. Paraquat included as the pesticide that 6 has the highest toxicity? 7 A. Yes, that's right, compared to four other 8 products. 9 Q. Okay. Now turn to 4, the next page. 10 Under "Issues," it suggests that McKinsey had 11 undertaken interviews of both parties, right? 12 A. Yes. 13 Q. And both parties being ICI Americas as 14 well as Chevron? 15 A. That's, I assume, to be correct, yes. 16 Q. So the information provided here would 17 have been based on things told to McKinsey by both the 18 individuals at ICI as well as Chevron, to your 19 understanding? 20 A. That would be my understanding. 21 Q. One of the concerns includes: 22 "Do environmental risks outweigh cost 23 advantages?" 24 Right? 25 A. Yes.	429 1 BY MR. DICKENS: 2 Q. We did see yesterday the email that 3 specifically asked would those in the public, as well 4 as academics, understand us putting economics over 5 safety. 6 We saw that document, right? 7 MR. NARESH: Objection to the form. 8 THE WITNESS: Yes, but all these documents 9 have to be put into context and I'm describing you a 10 big-picture truth, which is that, in my experience, 11 because I was a member of Product Safety, our input 12 was always taken very seriously. 13 BY MR. DICKENS: 14 Q. The context within the document we 15 reviewed yesterday was one of the disadvantages to 16 having a symposium to talk about the risks of paraquat 17 was that "Some may not understand us putting economics 18 over safety"; that was the context, right? 19 A. And if I remember rightly, that was 40 to 20 50 years ago and I think I said yesterday that, 21 you know, it's the kind of conversation that would be 22 very different to today. 23 Q. Okay. 24 MR. DICKENS: You can put that aside. 25 I'll hand you the biggest one of the batch,
428 1 Q. In fact, concerns exist in almost every 2 element of the business system, right? 3 A. I don't know what you mean by that last 4 statement. 5 Q. But that's what it says? 6 MR. NARESH: Well... 7 BY MR. DICKENS: 8 Q. That's what it says? 9 A. Where does it say that, sorry? Oh, you 10 mean the top -- 11 Q. That's what -- 12 MR. NARESH: Oh, you're reading -- 13 THE WITNESS: Yeah. 14 MR. NARESH: You're reading from a 15 different part. 16 THE WITNESS: Right, okay. 17 MR. NARESH: Okay. 18 THE WITNESS: By the way, I think while 19 we're talking about that, do environmental risks 20 outweigh cost advantages, that -- I mean, that's 21 a phrase which I recognize, it's something which, in 22 my experience, is always an issue, constantly an 23 issue: making sure that we are aware of risks and that 24 we are not simply being driven by profit or cost. 25 ///	430 1 Exhibit 63. 2 (Exhibit 63 marked for identification.) 3 MR. NARESH: Same as before, may I have 4 a standing objection as to foundation as to the 5 document and any questions related to it? 6 MR. DICKENS: You can. 7 BY MR. DICKENS: 8 Q. Okay. This exhibit's a final report of 9 McKinsey & Company, which was finalized on 10 February 24, 1986, correct? 11 A. That's right. 12 Q. Okay. And, once again, you reviewed this 13 in preparation for the deposition? 14 A. We looked at this, yes. 15 Q. Now, if we can turn to the page ending in 16 1500 and the Introduction section: 17 "This report details the findings of the 18 investigation into paraquat marketing in the United 19 States." 20 Right? 21 A. Yes. 22 Q. And both Chevron as well as ICI Americas 23 separately sponsored this particular study, right? 24 A. Yes. Excuse me. I was just making sure 25 I could read the full page. Yes, indeed. Yes.

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431 1 Q. So it wasn't only Chevron but ICI agreed 2 for this study to move forward, right? 3 A. Yes. 4 Q. And, indeed, they sponsored it? 5 A. Yes. 6 Q. And, indeed, they would have received a 7 copy of the report at the time of finalization, right? 8 A. I assume they did. 9 Q. Do you see anything that would suggest 10 that they did not? 11 A. No. 12 Q. At the bottom of that introduction: 13 "... McKinsey was asked to perform the 14 study from the point of view of the paraquat industry, 15 without addressing issues that may arise from the 16 competitive relationship between the two companies." 17 And do you understand "the two companies" 18 being Chevron and ICI Americas? 19 A. Yes. 20 Q. The implications: "economic feasibility of 21 possible paraquat opportunities." 22 Right? 23 A. Yes. 24 Q. And: 25 "Second, past and present marketing	433 1 A. I do. 2 Q. It says the: 3 "Interviews suggest [...] in certain parts 4 of the country, growers find use of Roundup to be 5 cheaper than paraquat, which, combined with its 6 superior efficacy, makes it the product of choice." 7 Right? 8 A. Yes. 9 Q. And that's what these interviewers were 10 telling McKinsey, who was conducting this study on 11 behalf of Chevron and Syngenta, right? 12 A. Yes, and that would be the opinion of 13 people for whom, if you like, the agronomic need for 14 a herbicide would make that true. There are other 15 agronomic needs where paraquat is more effective, more 16 appropriate than Roundup. 17 Q. Turn to page 1616. 18 It states: 19 "However, there are a number of times 20 where the choice of paraquat or a competing herbicide 21 is a 'close-call' decision. In these cases, dealers 22 can influence the growers' purchase decision if they 23 have an incentive to do so." 24 Right? 25 A. That's what it says.
432 1 decisions made by each company may differ from those 2 recommended herein..." 3 Right? 4 A. Yes. 5 Q. And part of what was done in this 6 particular report included interviews with growers, 7 correct? 8 A. Yes, I believe it did. 9 Q. If we can turn to page 11537. 10 I apologize, wrong page. 570. 11 Now, we discussed yesterday and I believe 12 you said that glyphosate and glufosinate were less 13 toxic than paraquat was; is that right? 14 MR. NARESH: Objection to form. 15 THE WITNESS: I don't know -- I can't 16 remember whether we discussed glyphosate and 17 glufosinate, but in terms of acute toxicity, that is 18 true. 19 BY MR. DICKENS: 20 Q. It states: 21 "In addition to issues of efficacy, it 22 also seems that paraquat may be losing some sales to 23 Roundup due to cost, despite the fact that generally 24 Roundup is more expensive." 25 Do you see that?	434 1 Q. And, in fact, the report finds that 2 distributors or dealers have the most influence on the 3 growers' herbicide decisions, right? 4 A. Where are you looking to make that point? 5 Q. We can turn to 11620. 6 A. Yes, okay, that's what that says there. 7 Q. Specifically: 8 "Dealers appear to have the most influence 9 on the grower's herbicide decision." 10 That's what McKinsey found? 11 A. That's what it says, yes. 12 Q. And turn to 11698. 13 That says: 14 "In the growers' buying decision, toxicity 15 operates as a negative product characteristic that 16 must be traded off against [...] efficacy and cost..." 17 Right? 18 A. Yes. 19 Q. "... many users are willing to pay a 20 'toxicity premium' for a product they perceive as 21 safer. [...] premium does not appear large..." 22 So, in essence, individuals would be more 23 willing to pay more for a safer product? 24 A. If that was -- if that alternative product 25 was able to do the job that they needed, perhaps.

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435 1 Q. McKinsey states: 2 "... there is little potential of changing 3 paraquat's basic toxicity level [...], there is the 4 opportunity to change its perception in the 5 marketplace." 6 Right? 7 A. That's what they said. 8 Q. And, indeed, that's what ICI/Syngenta 9 attempted to do after it took over the marketing and 10 sale of paraquat in the United States in 1986, right? 11 A. I think that's a misrepresentation. 12 I think that at no time was ICI trying to say that 13 paraquat is safe to use, you don't need to worry about 14 it. It was, as we've said many times, it was ensuring 15 that people understood, farmers understood, that there 16 are situations where that toxicity could become an 17 issue. 18 Q. With respect to the toxicity issues and 19 concerns, Syngenta and ICI undertook efforts to change 20 the perception of paraquat in the marketplace, did 21 they not? 22 MR. NARESH: Objection; asked and 23 answered. 24 THE WITNESS: No; again, I think that's 25 the wrong way of putting it. I mean "perception gap"	437 1 part of this team are part of the leadership within 2 Syngenta itself, right? 3 A. Again, I don't know exactly who was on the 4 PLT at this time to confirm their status in 5 leadership. 6 Q. Now, we've looked at the McKinsey 7 document, the final report, in February 1986. It was 8 in 1986 that Chevron stopped the marketing and sale of 9 Gramoxone in the United States? 10 A. Yes, that's right. 11 Q. And so Syngenta took over in 1986 and has 12 held the responsibility for the sale and marketing 13 from 1986 to the present? 14 A. That's my -- 15 MR. NARESH: Well, I'll object to the 16 foundation and form. Are you asking as between ICI 17 and Chevron, or are you asking generally? 18 BY MR. DICKENS: 19 Q. Generally, with respect to the -- 20 MR. NARESH: Well, are you asking if 21 Syngenta is the sole supplier of paraquat in the 22 United States? 23 MR. DICKENS: No. So, yeah, let me ask 24 you that way. I guess that is a better -- thank you, 25 Ragan.
436 1 is a phrase used by McKinsey. What we've been seeing 2 is that ICI/Syngenta were trying to inform the users 3 of its product about hazards and how they could be 4 avoided and the product could be used safely. 5 MR. DICKENS: You can put that aside. 6 I'll mark Exhibit 64 for the record. 7 (Exhibit 64 marked for identification.) 8 MR. DICKENS: This is topic 44. 9 The exhibit I handed you is a "Gramoxone 10 PLT," dated April 10, 2001. 11 BY MR. DICKENS: 12 Q. A document you've seen before, right, 13 Dr. Botham? 14 A. Yes, I have. 15 Q. And do you know what PLT is referring to? 16 A. I don't know that this is correct: 17 I believe it is product leadership team. 18 Q. Okay. What was the role of the product 19 leadership team at Syngenta? 20 A. Again, I've not seen a remit of this team 21 as to what it was in 2001, but this would suggest that 22 it would be to take an overview of Gramoxone and how 23 it's being marketed and any concerns that may surround 24 that, including safety. 25 Q. And the individuals that would have been	438 1 BY MR. DICKENS: 2 Q. Chevron has no more responsibility for 3 sale and marketing of paraquat or Gramoxone in the 4 United States, as far as you know? 5 A. As far as I know. 6 Q. And Syngenta continues, from 1986 to 7 present, to sell paraquat-containing formulations in 8 the United States? 9 A. Yes. 10 Q. If we can turn to page 2. At this stage 11 there was a regulatory update and one of the issues 12 that was listed is Parkinsonism, right? 13 A. Yes. 14 Q. And there is a "US dust mist filter," 15 right? 16 A. Yes. 17 Q. And that -- 2001 is when the respirator 18 was put onto the labeling once again for the Gramoxone 19 products within the United States? 20 A. Right. 21 Q. Turn to page 5. There's a slide here, 22 "Parkinsonism," right? 23 A. Yes. 24 Q. It states: 25 "Parkinsonism is the issue of the day and

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439 1 is likely to remain so for the foreseeable future." 2 Right? 3 A. It does say that. 4 Q. And that was the case in April of 2001? 5 A. That's when these slides were produced, 6 yes. 7 Q. And Parkinsonism remains an issue of the 8 day as we sit here in 2024, right? 9 A. Parkinson's disease, I guess you would 10 say, was more accurately what the issue is. 11 Q. Okay. It's still an issue for Syngenta 12 today? 13 A. It is certainly still something which we 14 are very much involved in, yes. 15 Q. They note that there will be a Neurotox 16 conference to be held, right? 17 A. Yes. 18 Q. And Syngenta will ensure that they have 19 appropriate representation in attendance, correct? 20 A. Correct. 21 Q. And that, in fact, happened, as far as you 22 know? 23 A. Yes, I believe it did. 24 Q. Do you know who was at that particular 25 conference?	441 1 including maneb, so, yes, that's what was happening at 2 this time. 3 Q. And by this point in 2001, Syngenta 4 had not undertaken a similar study to measure neuronal 5 cell loss in substantia nigra, right? 6 A. No, not true. I mean, we had done work in 7 the 1990s, so some of the work that was published by 8 Widdowson and Naylor and others did include some 9 pathology work; so it wasn't -- it's not that we 10 didn't start looking at this issue until after this 11 time. 12 Q. And did that measure neuronal cell loss in 13 the substantia nigra? 14 A. It was -- the pathology was certainly 15 a component of what Peter Widdowson was measuring. 16 Q. And Widdowson/Naylor, that study was in 17 rats, correct? 18 A. That was in rats. 19 Q. The first study undertaken by Syngenta 20 measuring neuronal cell loss in the substantia nigra 21 in mice, that was the first of the Marks study? 22 A. Yeah, we -- so we started to work in -- 23 after this date, which was 2001, in the mouse model, 24 the one that we'd just been describing here, and the 25 work was led by Ted Lock that was conducted by Louise
440 1 A. I think Lewis Smith may have been there. 2 Q. And did you -- okay. Strike that. 3 It states: 4 "Research into environmental causes will 5 continue to increase as a result of the high 6 scientific profile and the research that suggests 7 there is not a predominantly genetic element to the 8 condition." 9 Right? 10 A. That was what was now coming out in 11 various places, including in the meetings that are 12 being described here, that there may be environmental 13 factors. 14 Q. The next page. There are some concerns 15 listed, right? 16 A. Yes. 17 Q. And it lists some new data relating to 18 neuronal cell loss in the substantia nigra following 19 paraquat administration down to 1 mg/kg IP dose, 20 right? 21 A. So these were the data that were emerging 22 from the use of that mouse model that we'd been 23 talking about before, intraperitoneal injection, 24 exaggerated exposure as a consequence, and sometimes 25 paraquat was being applied in with other pesticides,	442 1 Marks. 2 Q. Now, the study that's referenced here 3 under "Concerns," the result of that study is a 4 suggestion that paraquat can cause neuronal cell loss 5 in the substantia nigra, right? 6 A. They were claiming to see a loss of cells 7 in the substantia nigra, that's right. 8 Q. And so the concern was obviously that 9 those type of findings could link paraquat to 10 Parkinsonism or Parkinson's disease? 11 A. Absolutely, and we were not saying at that 12 time this is not possible; so our positioning of this 13 was, it may be described as a concern, but it's 14 a concern because it's something that needed 15 investigating. It may be real. 16 Q. Okay. So you didn't know if it was real 17 or not at this point in 2001? 18 A. Absolutely not, no. 19 Q. It was a possibility that it was real? 20 A. And we'd started from the premise that it, 21 indeed, possibly indeed was real, so we wanted to take 22 this very seriously. 23 Q. Let's look at the next page. It lists 24 Syngenta's strategy. Syngenta's strategy was to 25 "steer the focus of serious research away from

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443 1 paraquat." 2 Right? 3 MR. NARESH: I'll object on the rule of 4 completeness grounds. I think you need to read the 5 whole sentence and not just a snippet of it. 6 BY MR. DICKENS: 7 Q. "... which is an interesting academic 8 model (because of its crude similarities to 9 Parkinsonism-like agent MPTP) and on to other agents 10 that have neurotoxicity and exposure profiles more 11 consistent with being a potential causative or 12 contributory agent." 13 That was the strategy of Syngenta at this 14 time in 2001, right? 15 A. It's more subtle than that. I think this 16 was a very blunt way of describing the strategy. And, 17 look, I'm also describing how that strategy also 18 evolved very shortly after that. 19 So, yes, we wanted to see whether -- what 20 the weight of evidence was for other environmental 21 agents, and we certainly did some work on that, but it 22 didn't stop us from taking seriously the possibility 23 that paraquat was one such environmental agent. 24 Q. And, as you said earlier, you/Syngenta 25 didn't know if this was a real effect or not, right?	445 1 the paraquat leadership team meeting in 2001 2 specifically says, "We will try to discredit 3 assertions that paraquat is in any way implicated with 4 Parkinsonism?" 5 That's what the slides said, right? 6 A. The slides certainly say that and suggest 7 that people have that ambition, but I think that was 8 an ambition that was not one which was supportable. 9 Q. So that was an ambition at the time in 10 2001 but it's not an ambition that Syngenta stands by 11 here today? 12 A. It's not an ambition which we pursued, 13 absolutely, and the record shows that in terms of our 14 investment in this area of research. 15 Q. There was no efforts to discredit that 16 paraquat is implicated in epidemiology that you saw in 17 your role or in your position speaking on behalf of 18 the company? 19 MR. NARESH: I'll object to the form. 20 THE WITNESS: The word "discredit" is 21 a loaded term. What we also did, of course, is try to 22 talk, and to collaborate in some cases, with 23 researchers who were working in this field, working on 24 paraquat, to understand what they were doing, how they 25 were doing it, and, in some cases, to have
444 1 A. We didn't, no. 2 Q. And then if you didn't know and you didn't 3 have the answers, why would the focus be to steer 4 serious research away from paraquat? 5 A. I think that's because this slide does not 6 represent the strategy as it was actually implemented, 7 and implemented in reality very shortly after this 8 date of 2001. We've mentioned the Marks studies. 9 I mean, they started only a couple of years after 10 that. 11 Q. The last sentence referenced a review 12 paper of the epidemiology studies. 13 Then it says: 14 "... we will evaluate options for 15 publication and/or further studies to discredit 16 assertions that paraquat is in any way implicated." 17 Right? 18 A. I say, again, this is a strategy which was 19 put very bluntly at that time as being a way in which 20 we could, if you like, look at this issue, but it 21 is not, in any sense, the way in which we actually 22 implemented that strategy. That strategy was much 23 more open. It was not simply about discrediting the 24 research. 25 Q. Do you agree that the slides presented at	446 1 conversations about not over-interpreting their 2 findings at that stage, which is potentially one way 3 in which the word "discredit" has been used. But that 4 was not what was really meant by that. 5 MR. NARESH: Are you done with this one? 6 MR. DICKENS: That's a good question. 7 Yes, we're done with that one. You can put it away. 8 Mark 65 for the record. 9 (Exhibit 65 marked for identification.) 10 MR. NARESH: Can you just remind me of the 11 topic number, please? 12 MR. DICKENS: This one's 47. 13 MR. NARESH: All right. Thank you. 14 BY MR. DICKENS: 15 Q. Dr. Botham, this document I've handed you 16 is "Paraquat Regulatory Status, Outlook and Strategy," 17 December 2003, authored by Ian Wheals, right? 18 A. That's right. 19 Q. Remind me, Mr. Wheals is someone you spoke 20 with in preparation for today's deposition? 21 A. That's right, because he was a regulatory 22 manager for paraquat. 23 Q. The global regulatory manager for 24 paraquat? 25 A. He had been European and global regulatory

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447 1 manager. 2 Q. And did you discuss particular documents 3 with Ian Wheals? 4 A. Yes, we did. 5 Q. Do you know if you discussed this 6 document? 7 A. We didn't discuss this in detail. It was 8 -- we acknowledged that this was one of the documents 9 that had his name on it. 10 Q. Now, this document is roughly two years 11 after -- a little over two years after that last 12 document from the paraquat leadership team meeting 13 that we saw, right? 14 A. That's correct. 15 Q. And this document is to provide the 16 status, the outlook and a strategy for undertaking 17 regulatory actions with respect to paraquat, right? 18 A. And perhaps it's worth saying that there's 19 nothing special here about paraquat. These documents 20 were documents that were produced on a wide range of 21 products because this was part of the role of the 22 regulatory affairs department. 23 Q. This is a -- this is something that 24 Syngenta would do for all products. This one just 25 happens to deal with paraquat?	449 1 Q. The fourth factor from the bottom states: 2 "Success in containing the perceived 3 association between paraquat and Parkinson's disease 4 as an academic rather than a regulatory human safety 5 issue." 6 Right? 7 A. Yes, and let me explain that because it 8 actually fits with what I've been saying. Because, by 9 "academic," it means that -- this is not just true for 10 paraquat, again. Sometimes experiments are done, 11 again under exaggerated conditions, which have, in 12 reality, little or no relevance to human safety. And 13 so that was one view of the possible implications of 14 the kind of data that had been emerging before then. 15 But we went on to look at that in detail. 16 We did not dismiss it as a human safety issue at this 17 time, or beyond. 18 Q. So academic, once again, is looking at, as 19 you said, doses and methods of exposure that did not 20 mimic what was happening in the field? 21 A. That is certainly the case with 22 intraperitoneal injection, for example. 23 Q. Yet, when Syngenta undertook its studies 24 on an effect of paraquat on neuronal cell loss in 25 substantia nigra, you used IP studies, right?
448 1 A. Correct. 2 Q. And it was done for all products in order 3 to create, kind of, a look back as well as a look 4 ahead with respect to how we're going to handle 5 regulatory issues? 6 A. That's correct. 7 Q. Under The Executive Summary, the third 8 paragraph begins "Paraquat registrations..." 9 Right? 10 A. Yes. 11 Q. "Paraquat registrations will remain 12 insecure and will require considerable proactive 13 defense." 14 Right? 15 A. Yes. 16 Q. Syngenta at this time was proactively 17 defending its paraquat registrations in numerous 18 locations throughout the world, right? 19 A. That's correct. 20 Q. The last sentence: 21 "The situation between 2008-2013 and 22 beyond will be determined by a combination of 23 factors..." 24 Do you see that? 25 A. Yes, I do.	450 1 A. Because one of our research questions was: 2 Is this effect actually real? And part of that is, 3 can it be replicated in different labs, so we wanted 4 to ask that question. But we also ask other 5 questions, like is this relevant to humans, so we did 6 studies with different routes of exposure, including 7 the oral route. 8 Q. And you did find, in the IP studies, that 9 the effect was indeed real and could be -- 10 A. When we first started looking at this, 11 yes. The Marks -- Louise Marks studies initially did 12 seem to replicate that and that was fine. You know, 13 we went on to do more to try to understand that. 14 Q. The next item: 15 "Success in managing the development and 16 implementation of hazard based, precautionary, and 17 comparative regulatory policies." 18 Right? 19 A. Sorry, where are you looking now, please? 20 Q. Right under the last bullet point. 21 A. Okay, right. 22 Q. Do you see that? 23 A. Yeah. 24 Q. And that was one of the strategies of 25 Syngenta, not only at this time but moving forward,

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451 1 is to manage the development and implementation of the 2 precautionary principle, if you will? 3 A. This was a general point, actually, so 4 this was not specific to paraquat. 5 Q. Okay. Precautionary principle, that's an 6 approach to risk management where, if a risk exists, 7 then particular action should be taken, right? 8 MR. NARESH: I'll object to the scope -- 9 MR. DICKENS: Generally. 10 MR. NARESH: -- and the foundation. 11 You can answer if you can. 12 THE WITNESS: Yeah, it's better to 13 describe that if a hazard is identified, assume that 14 it might be a risk and take action appropriately. 15 BY MR. DICKENS: 16 Q. And that would include action such as 17 warning about that hazard? 18 A. It could, yes. 19 Q. And that's something that Syngenta thought 20 inappropriate, is if we don't know whether or not 21 there is a hazard or risk we shouldn't be warning if 22 we only believe it's a hazard? 23 A. Let's talk generalizations for a minute, 24 if I may. What we were trying to readjust, if you 25 like, was that to try to regulate products purely on	453 1 saw a variety of outcomes. 2 Q. And one of the strategies undertaken by 3 Syngenta was to discredit the findings within the 4 studies that did find a substantially increased risk 5 of Parkinson's associated with paraquat, did they not? 6 A. No, no, never to discredit. 7 MR. NARESH: Let me -- 8 THE WITNESS: Sorry. 9 MR. NARESH: I'll object to the form, 10 foundation and the scope. 11 Please go ahead. 12 THE WITNESS: Yeah. No, "discredit" 13 is not a term that I would use, definitely not here. 14 It was always to understand and to do -- to use the 15 scientific process of, in some cases, reanalyzing 16 data, discussing with other researchers. 17 BY MR. DICKENS: 18 Q. "Discredit," to be fair, wasn't my term. 19 That was the term specifically used by the paraquat 20 leadership team when they were discussing epidemiology 21 studies, right? 22 A. It's a term which is loaded and it's not 23 a term that I feel comfortable with and wouldn't have 24 felt comfortable with it then. 25 It's -- more importantly, however, it's --
452 1 the basis of hazard and not taking into consideration 2 exposure, and therefore risk, was not only 3 precautionary, but, actually, was unnecessary in 4 order -- in many cases, not all but in many cases, to 5 protect human health and the environment. 6 Q. And that's true from Syngenta's position 7 even if the company didn't know whether or not there 8 was a risk yet? 9 A. We always looked at, as we've been 10 describing here, and now specifically with paraquat, 11 if you wish, the findings in the mouse model, there's 12 a hazard that's identified. So we wanted to 13 understand is that hazard real, is it replicable, is 14 it -- and is it relevant in terms of is this ever 15 likely to be seen in human beings? 16 Q. Now, at this point in 2003, there were 17 epidemiological studies that were conducted that 18 showed a substantially increased risk of Parkinson's 19 disease following paraquat exposure, right? 20 A. By 2003, certainly epidemiology studies 21 had begun to appear. Some showed an effect, others 22 did not do. There was a mixture of outcomes. 23 Q. In 2003, there was a mixture of outcomes? 24 A. Yeah, and that was certainly something 25 that continued over the forthcoming years, that you	454 1 when I talked about strategy and implementation, we 2 did not implement a strategy purely based on 3 discrediting other people's research. We entered into 4 that world of research on paraquat and Parkinson's 5 through significant investment. 6 Q. Key regulatory strategy elements, and 7 there are some bullet points. The second from the 8 last: 9 "Build capability to defend both the 10 license to sell and freedom to sell paraquat in 11 potential future risk assessment (neurotoxicity) and 12 hazard paradigms." 13 That's what it says, right? 14 A. Yeah, correct. And perhaps I could 15 explain -- 16 Q. Okay. 17 A. -- because it's important. What we meant 18 there, license to sell is how would regulatory 19 authorities view issues, for example around safety. 20 Freedom to sell was much more about what 21 we felt as a company: Do we feel that we should be 22 selling any substance, not just paraquat, if we feel 23 that there is any genuine health or environmental 24 concern. So I'm talking generically here but it 25 equally applied to paraquat.

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455 1 MR. DICKENS: And I'll move to strike. 2 BY MR. DICKENS: 3 Q. My question simply was, this document says 4 at the time, in 2003: 5 "Build capability to defend both the 6 license to sell and freedom to sell paraquat in 7 potential future risk assessment (neurotoxicity) and 8 hazard paradigms." 9 That's what this document says, right? 10 MR. NARESH: And I'll object to the motion 11 to strike and note for the record that if we're just 12 here to ask what the document says, then we could have 13 done that in writing. 14 MR. DICKENS: I'll follow up, but I can't 15 get long-winded answers after I ask if that's what the 16 document says. 17 MR. NARESH: Well, if you let the 18 witness -- 19 MR. DICKENS: Answer my questions. 20 MR. NARESH: If you let the witness answer 21 the question, you know, you just struck the answer to 22 the question. 23 MR. DICKENS: No -- 24 MR. NARESH: You're free to move to 25 strike. But I'm just saying, you know, all you're	457 1 A. Many products from Syngenta are important 2 and it was always essential that we had the right 3 capability to be able to understand whether, in this 4 case, the sales of a blockbuster product are things 5 that we can sustain from that perspective of license 6 to operate and freedom to operate. 7 Q. The objective was to achieve Gramoxone 8 sales at \$388 million, right? 9 A. Indeed. So there were commercial targets, 10 indeed. 11 Q. And, as we know from looking at previous 12 documents, concerns of toxicity had a potential 13 effect, negative effect, on the sales of paraquat, 14 right? 15 MR. NARESH: Let me just make a belated 16 question to the prior -- belated objection to the 17 prior question, which left out a word. 18 THE WITNESS: Right. So, yeah, we were 19 talking about the perception of toxicity before. A 20 lot of those perceptions were about its acute 21 toxicity, so we need to avoid conflating what was 22 meant by "toxicity" here. 23 BY MR. DICKENS: 24 Q. Okay. So you don't believe that the 25 concerns of neurotoxicity have affected Gramoxone
456 1 doing is making the deposition longer because I'm 2 obviously going to ask on redirect what that meant, 3 and so we can do it two times or we can just move on. 4 But, you know, this is just extending the 5 deposition. Go ahead. Do what you want to do. 6 THE WITNESS: Would you like to repeat 7 your question, please. 8 BY MR. DICKENS: 9 Q. In 2003, one of the key regulatory 10 strategy elements that's noted in this document is: 11 "Build capability to defend both the 12 license to sell and freedom to sell paraquat in 13 potential future risk assessment (neurotoxicity) and 14 hazard paradigms." 15 That's what's written in this document in 16 December 2003, correct? 17 MR. NARESH: I'll object as asked and 18 answered. 19 THE WITNESS: And that meant capability 20 both in regulatory expertise and safety expertise. 21 BY MR. DICKENS: 22 Q. Turn the page. Now, one of the reasons 23 for the wanting to maintain license and freedom to 24 sell was that paraquat was a blockbuster product for 25 Syngenta, right?	458 1 sales? 2 A. I don't know whether those concerns have 3 affected sales. That's something that I've not been 4 able to measure. 5 Q. Well, certainly it's affected sales to the 6 extent that countries have withdrawn the registration 7 of paraquat due to concerns of neurotoxicity, correct? 8 A. The only country that has specifically 9 cited neurotoxicity Parkinson's disease as a reason, 10 not the only reason, for withdrawing the registration 11 is Brazil. 12 Q. Brazil, at this point in 2003, was one of 13 the top ten markets for Gramoxone business, right? 14 A. That's right, yes. 15 Q. And that remained true all the way up 16 until it withdrew the registration of paraquat? 17 A. I don't have those data to hand, so... 18 Q. We looked at the document earlier with 19 respect to Sweden in 2003, and in the comments Sweden 20 specifically brought out, as one of its concerns, 21 potential neurotoxicity, right? 22 A. It did, but if you remember, there were 23 two reasons given for that: One was a specific 24 finding in some of the chronic toxicity studies about, 25 I think it was sciatic nerve degeneration, and they

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459 1 also mentioned Parkinson's disease but purely because 2 of analogy with MPTP at that time. 3 Q. Okay. At that time in 2003, but then in 4 2007 when it challenged the EU commission through the 5 court system, it once again raised neurotoxicity, 6 right? 7 A. It did, yes. 8 Q. Okay. And that, at that point, had -- and 9 it was armed with the epidemiology as well as 10 additional studies? 11 A. At that time, of course. Things had moved 12 on, so it was adding additional concerns to that, yes. 13 Q. Turn to page ending in 715. Section for 14 NAFTA and then USA. 15 Do you see that? 16 A. Yes. 17 Q. At this point in 2003, USA was the largest 18 market globally? 19 A. That's what it says, yes. 20 Q. Then the very last sentence begins "NIEHS 21 funding..." 22 Do you know what that's referring to? 23 A. Yes. Yes, I believe that this is likely 24 to be the NIEHS funding of the study that is now known 25 as the Agricultural Health Workers study.	461 1 Q. Okay. So you don't know if this is 2 actually referring to Dr. Ritz's study, but you 3 believe it's the AHS, right? 4 A. Well, that's what I've said; I assumed it 5 was, but I may have mispositioned that. But you're 6 quite right; there were two studies going on and the 7 Ag Health Study was certainly funded through NIEHS. 8 MR. NARESH: Just to clean the record, 9 I think you've been using the AHS acronym and I think 10 it's showing up as N -- 11 (Stenographer interjection.) 12 MR. NARESH: I think Dave has been using 13 the AHS acronym for the last couple of sentences. 14 I don't think that acronym has been defined. I think 15 you're talking about the Ag. Health Study, but in the 16 -- I think Leah picked it up as "NIEHS study," so 17 you -- 18 MR. DICKENS: Got it, okay. 19 MR. NARESH: -- may want to fix that. 20 THE STENOGRAPHER: Thanks. 21 MR. DICKENS: Thank you. 22 BY MR. DICKENS: 23 Q. So the Agricultural Health Study, that's 24 often referred to as "the AHS study," A-H-S, right? 25 A. It is.
460 1 Q. Okay. And they were funding a study that 2 would study environmental effects of pesticides, 3 right? 4 A. They were looking at, yes, the adverse 5 health effects in farmers that could have been due to 6 exposure to substances in the environment. 7 Q. And that included a review of pesticides 8 and a potential link to Parkinson's disease, right? 9 A. It was initially meant -- very much 10 directed towards cancer and pesticides generally, not 11 just paraquat, but then one of the interests that was 12 included was Parkinson's disease. 13 Q. So you're aware the AHS study was ongoing 14 at this time. Were you also aware that a 15 Dr. Bede Ritz was undertaking studies on Parkinson's 16 disease and pesticides? 17 A. So, yes, Dr. Ritz is in California. This 18 is a separate study. So, yes, she was doing -- 19 investigating the potential link between paraquat 20 exposure and Parkinson's disease in the California 21 Valley. 22 Q. Do you know whether Dr. Ritz had received 23 NIEHS funding for her studies? 24 A. I don't have to hand what her funding 25 sources were, I'm sorry.	462 1 Q. And that may or may not be the study that 2 received NIEHS funding, as far as you know? 3 A. It probably is. 4 Q. Now, at this stage, the results of this 5 study would not have been available, as it was just 6 funded, right? 7 A. Correct. 8 Q. The sentence goes on: 9 "... will ensure Parkinson's disease 10 remains a high profile in the US academic, medical and 11 potential regulatory communities. This could 12 potentially pose a threat to paraquat and needs to be 13 proactively managed." 14 Right? 15 A. Yes, which, in practice, means we need to 16 understand how is that study being conducted, do we -- 17 can we see protocols, do we -- can we find reports, 18 make sure that we're aware of publications. 19 Q. And it would have posed a threat if it 20 indeed found that there was a link between Parkinson's 21 disease and paraquat, right? 22 A. Absolutely. Going back to my definition 23 of "freedom to sell," if a study such as this, looking 24 at real human beings, gave a sort of definitive 25 position on causation, then that would be something

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463 1 that we would need to act upon. 2 Q. And one of those ways to act upon that or 3 proactively manage it is to be ready to challenge or 4 support the AHS results depending on how they came 5 out? 6 A. It's certainly to understand them and, if 7 necessary, to challenge if we think that there may 8 have been interpretations which we wouldn't agree 9 with. 10 Q. Challenge if they found a link, and 11 support if they did not find a link, right? 12 MR. NARESH: Objection; asked and 13 answered, and also vague as to the word "link." 14 THE WITNESS: I think that's, you know, 15 a very strong misrepresentation. We will, and always 16 have wanted to, address the findings of any research 17 programs, including AHS, as objectively as we can as 18 fellow scientists. 19 BY MR. DICKENS: 20 Q. Turn to page 719. The section at the 21 bottom, "Neurotoxicity." 22 A. Yes. 23 Q. The second sentence: 24 "New studies pose risk of unexpected 25 findings at doses below current reference doses."	465 1 Q. "Develop links with key researchers to 2 gain forward visibility and influence [future] work." 3 Right? 4 A. Yes. 5 Q. Influence in the favor of paraquat? 6 A. No. This is -- again, I think as we 7 discussed yesterday, "influence" is an overused word 8 and I think that this -- again, the record shows that, 9 actually, what we were largely doing was to be able to 10 talk to researchers in this area, to understand what 11 they were doing, how they were interpreting their 12 work, and if we didn't agree with their 13 interpretation, we would certainly be -- you know, 14 feel open to do that. That's what scientists do. 15 Q. The fact you implement an influencing 16 strategy to "once again shift the focus of serious 17 Parkinson's research to other environmental factors 18 and exposure profile more consistent with being a 19 Parkinson's disease risk factor." 20 This is the same statement that we saw in 21 the 2001 document, right? 22 A. Yeah, but you're just reading one bullet 23 point there out, or one sub-bullet point from that 24 particular section. So we're also talking about 25 ensure that a rational risk assessment will prevail.
464 1 Right? 2 A. That's because at that time, I think what 3 this is referring to is that we had seen, for example, 4 those studies with intraperitoneal dosing, and there 5 had not yet been a thorough evaluation of not just the 6 relevance of that dosing route but how low in the dose 7 response does any effect -- can any effect be seen. 8 Q. And the risk was that there would be 9 findings showing an effect on the brains of the 10 animals after paraquat administration that were below 11 the current reference dose? That was the risk posed 12 to Syngenta, correct? 13 MR. NARESH: Object to the form. 14 THE WITNESS: This is at a time where, 15 again, we were not in any sense disputing that these 16 effects could be real, and so obviously, as in all 17 good toxicological good practice, we would want to 18 understand where is the 'no effect' level for that, is 19 there a margin of safety which would mean that it 20 would be improbable or implausible for humans to be 21 exposed to sufficient paraquat to cause that effect. 22 BY MR. DICKENS: 23 Q. And then at the bottom it includes some 24 strategies, right? 25 A. Yes.	466 1 So that's, again, back to the point we've 2 just been talking about. If the effect is real, then, 3 you know, what is the -- is that hazard really a risk; 4 that's what that actually means. So it's not just 5 about deflecting to other substances. Of course that 6 was something that we also wanted to try to 7 understand, and it was something that we did. 8 Q. Syngenta was really concerned about why -- 9 if the risk was real, why would it want to shift the 10 focus of serious Parkinson's disease research away 11 from paraquat? 12 MR. NARESH: I'll object to the form. 13 THE WITNESS: It wanted to -- 14 predominantly, it wanted to understand the hazard and 15 the risk, particularly the risk, of exposure to 16 paraquat. It also wanted to understand whether there 17 were other environmental factors that could also be 18 contributory to Parkinson's disease. 19 This is, you know, still, and still to 20 this day, a very open subject. 21 BY MR. DICKENS: 22 Q. Wouldn't the best way to find out if there 23 was a particular risk is to allow the serious 24 Parkinson's disease research on paraquat to continue? 25 MR. NARESH: Objection to form.

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467 1 THE WITNESS: It's to allow it to 2 continue, yes. 3 BY MR. DICKENS: 4 Q. And not shift the focus away from paraquat 5 of that Parkinson's disease research? 6 MR. NARESH: Same objection. 7 THE WITNESS: What we were trying to do 8 here, when it says "shift the focus to other 9 environmental factors," is, as I said before, to see 10 if there were other possible environmental 11 contributors to Parkinson's disease. Then you can do, 12 again, a weight of the evidence: Is it likely that 13 other environmental factors, because we're exposed to 14 more -- you know, the risk is higher, would they 15 likely be a more rational explanation than paraquat. 16 BY MR. DICKENS: 17 Q. If you didn't know that there was -- 18 whether or not there was a risk and whether or not it 19 was real, wouldn't the appropriate timing for 20 undertaking neurotoxicity studies be then and now, at 21 this point in December 2003? 22 A. That's exactly when we did re-embark on 23 a major research program. 24 Q. Okay. And you embarked on that program at 25 this stage in 2003, but the risk, as we saw in the	469 1 to check the record, but the significant research -- 2 Peter Widdowson left the organization, so there was 3 a period when we didn't have any -- have a 4 neurotoxicologist to do such research, and we employed 5 Louise Marks to reenergize our research effort. 6 Q. There was no one at Syngenta that could 7 have undertaken neurotoxicity studies between 1986 and 8 2004 -- 9 MR. NARESH: You said -- 10 BY MR. DICKENS: 11 Q. Sorry, 1996 and 2004? 12 A. We had people who could do certain types 13 of studies, but, increasingly, it was evident that 14 those sort of studies required specialized technical 15 knowledge and understanding, and that's why we -- 16 Louise Marks was engaged. 17 Q. You engaged and hired Louise Marks in 2004 18 specific to figuring out whether or not there was a 19 real risk of neurotoxicity associated with paraquat? 20 MR. NARESH: I'll object to the form. 21 I don't think -- well, I don't want to speak. 22 Go ahead, if you can answer. 23 THE WITNESS: We wanted to see, as I said 24 earlier, if the findings that were being published 25 early in the 2000s showing an effect in mice of
468 1 last document, was in existence in 2001, right? 2 A. We -- 3 MR. NARESH: Object to the form. 4 Go ahead. 5 THE WITNESS: Yeah. And we had started 6 looking at that risk/hazard even before then, 1996. 7 So it wasn't that suddenly in 2001/2003 we were 8 looking at this issue; it would have been on our 9 agenda, if you wish, for seven or eight years. 10 BY MR. DICKENS: 11 Q. So Widdowson and Naylor told the company, 12 "Okay, we've answered it. There is no risk, we 13 know..." 14 MR. NARESH: I'll object to the form. 15 BY MR. DICKENS: 16 Q. "... no further studies are necessary"? 17 MR. NARESH: Same objection. 18 THE WITNESS: They never said that, as far 19 as I know, but -- I never heard them say that, put it 20 that way. 21 BY MR. DICKENS: 22 Q. It didn't generate -- Syngenta did not 23 undertake any neurotoxicity studies between Widdowson 24 and the first Marks study in 2004? 25 A. I don't believe so. Again, I would need	470 1 intraperitoneal injection of paraquat, requiring you 2 to do some pretty specialized pathology in the brain, 3 the stereology included, we wanted to see if that 4 effect was real, replicable, and hence whether it may 5 be relevant to human risk. 6 MR. DICKENS: We can put this aside. 7 Why don't we take a break. 8 THE VIDEOGRAPHER: We are going off the 9 record at 11:58. 10 (Lunch break taken.) 11 THE VIDEOGRAPHER: We are back on the 12 record at 12:51. 13 BY MR. DICKENS: 14 Q. Welcome back, Dr. Botham. I've handed you 15 -- well, before we get there, the last document we 16 were looking at was in December 2003. As we were 17 discussing, Syngenta at that stage were still trying 18 to determine whether or not the risk related to 19 neurotoxicity was real, right? 20 A. Yes. 21 MR. DICKENS: I've handed you Exhibits 66 22 and 67. 23 (Exhibit 66 marked for identification.) 24 (Exhibit 67 marked for identification.) 25 MR. DICKENS: 66 is the cover page to

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471 1 a PowerPoint presentation. 2 BY MR. DICKENS: 3 Q. Do you see that? 4 A. I do. 5 Q. And what's the date? 6 A. The original email was 5 March 2007. 7 Q. Okay. So in 2007, there was a PowerPoint 8 presentation titled "Parkinson's Disease: What can 9 Syngenta say about the issue?" 10 Right? 11 A. That's right. 12 Q. And you've seen this document before, 13 correct? 14 A. I have, yes. 15 Q. I'm going to actually turn to the pages 16 that are a little larger for us to read, which begin 17 on 2235. 18 A. Right. 19 Q. And then -- it's the same presentation, 20 and then two pages later, there's a slide here, "What 21 we cannot say." 22 A. Yep. 23 Q. Right. So, in 2007, Syngenta could not 24 say that "paraquat does not enter the brain," correct? 25 A. Correct.	473 1 A. I -- 2 MR. NARESH: I'll object on the foundation 3 and the scope. 4 If you can recall. 5 THE WITNESS: Yeah. I mean, I don't 6 recall that such a definitive statement may have been 7 -- had been made, but maybe there is something in the 8 record which I would need to be reminded of. 9 MR. DICKENS: I'll hand you a document, 10 Exhibit 68. 11 (Exhibit 68 marked for identification.) 12 MR. NARESH: Which topic was 66 and 67, 13 and 68? 14 MR. DICKENS: 68 is topic 26, and the 15 previous two were 68. 16 MR. NARESH: Thank you. 17 BY MR. DICKENS: 18 Q. Exhibit 68 is another regulatory options 19 document, dated September 28, 2007, right? 20 A. That's right. 21 Q. So this is roughly four years after the 22 last regulatory document that we looked at, correct? 23 A. Yeah, I think the last one we looked at 24 was 2003. 25 Q. Okay. And this is a little bit after the
472 1 Q. Syngenta could not say "paraquat does not 2 cause any changes in the brain," correct? 3 A. Correct. 4 Q. Syngenta could not say "paraquat only 5 causes effects in the mouse," correct? 6 A. Correct. 7 Q. Syngenta could not say "the mouse data on 8 paraquat are not relevant to humans," correct? 9 A. Correct. 10 Q. Syngenta could not say "people are not 11 exposed to paraquat," correct? 12 A. Correct. 13 Q. Syngenta could not say "there are no data 14 reporting that paraquat may be associated with 15 Parkinson's disease in humans," correct? 16 A. Correct. 17 Q. And Syngenta could not say "the data show 18 that paraquat does not cause Parkinson's disease in 19 humans," correct? 20 A. Correct. 21 Q. Now, we can put this aside. 22 Are you aware of any instances where 23 Syngenta said publicly in the 2007, or after, that 24 paraquat -- the data shows that paraquat does not 25 cause Parkinson's disease in humans?	474 1 "What we cannot say" document, correct? 2 A. So March, and this was September; yes, 3 correct. 4 Q. Okay. This is deemed confidential, right? 5 A. Yes. 6 Q. And included names on this are the global 7 product registration herbicide lead and global product 8 registration manager for Syngenta, right? 9 A. Yeah, that's correct. 10 Q. And then turn to page 4. 11 At the very top, it lists some countries 12 in which paraquat is formally banned, right? 13 A. It does, yes. 14 Q. Okay. And included in this is Sweden, 15 which we've discussed, right? 16 A. Yes. 17 Q. As well as some others? 18 A. Yes. 19 Q. Then there's: 20 "Paraquat is no longer registered in..." 21 Right? 22 A. Yes. 23 Q. And Switzerland is included there? 24 A. That's right. 25 Q. What's your understanding of the

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475 1 distinction between "no longer registered in" and 2 formally banned? 3 A. I'm not a regulatory expert, but I guess 4 one interpretation would be that we -- the second 5 category is that we either -- we had registrations but 6 chose not to continue with them. 7 Q. And in your Exhibit 1, you generated a 8 list of countries in which paraquat's no longer sold 9 in; is that right? 10 A. Yes, that's right. 11 Q. Is that a current list? 12 A. That's the current list as provided to me, 13 yeah. 14 Q. Okay. As provided to you or did you 15 generate that list? 16 A. No, I was given some assistance with this 17 because this is regulatory and commercial. 18 Q. Okay. And that is something that you 19 brought with you here today as preparation for today's 20 deposition? 21 A. It is, yeah. 22 Q. And did you confirm the information on 23 this document was correct or accurate? 24 A. I took that the information was accurate 25 because of the people who helped put it together.	477 1 re-registration based on toxicity issues, right? 2 MR. NARESH: Same question -- same 3 objections. 4 THE WITNESS: I think we'd need to get 5 into some specific examples of that. 6 BY MR. DICKENS: 7 Q. Did you, in your preparation for today's 8 deposition, see any examples of that? 9 A. The only specific example which we may be 10 coming on to talk about is the consequence of the CFI, 11 the Court of First Instance, ruling in the European 12 Union, which wasn't based on an assessment of safety, 13 but subsequently we did look at the safety profile and 14 its impact on the potential for continuing 15 registration in Europe. 16 So that's the one example that I've been 17 looking at. 18 Q. The Court of First Instance's ruling in 19 the European Union did consider safety issues related 20 to paraquat, right? 21 A. The Court of First Instance obviously had, 22 as part of this documentation, some of the issues that 23 have been raised, for example by Sweden, but the 24 decision to overrule the Commission's recommendation 25 that paraquat could be re-registered was a
476 1 Q. Okay. But, once again, that's not a 2 document that you yourself generated? 3 A. No. I wouldn't have had the know-with-all 4 to do that. 5 Q. Okay. Now, you mentioned there are 6 certain countries in which paraquat's no longer 7 registered in and the company decided not to seek 8 re-registration, right? 9 A. Yes. 10 Q. And that was a strategy undertaken by 11 Syngenta, right, to choose not to re-register or seek 12 re-registration in particular countries? 13 A. That's right. 14 Q. And that's, in part, in a way to prevent 15 negative information or a negative association with 16 paraquat? 17 MR. NARESH: I'll object on the foundation 18 and scope. 19 THE WITNESS: I would have said that that 20 was, in the vast majority of the cases, not true. 21 I think many of these would have been based on 22 commercial reasons. 23 BY MR. DICKENS: 24 Q. Well, certainly Syngenta made a tactical 25 decision with respect to whether or not to seek	478 1 procedural -- based on a procedural -- the wrong use 2 of procedures. 3 Q. And that included consideration of studies 4 that were not submitted by Syngenta, right, for 5 consideration? 6 MR. NARESH: Objection to form and 7 foundation. 8 THE WITNESS: Which studies would that... 9 BY MR. DICKENS: 10 Q. Are you aware of the Court of First 11 Instance in the European Union making reference to the 12 fact that studies were not submitted at the time of 13 registration of paraquat in which they were 14 considering whether or not the procedures were 15 followed? 16 A. I don't immediately remember that, and it 17 would be helpful to see which studies they were 18 referring to. 19 Q. You don't recall any discussion as to the 20 failure to submit neurotoxicity studies as one of the 21 procedural issues? 22 A. That is something which I don't 23 immediately remember. 24 Q. Turn to page 930. Under 5, there's a 25 "Regulatory Options." The first bullet point, "For

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479 1 paraquat," it mentions: 2 "... defense of registrations and 3 avoidance of bans is key for potential growth." 4 Right? 5 A. It does say that, yes. 6 Q. And that's referring to business growth 7 for the company, correct? 8 A. It is. 9 Q. And certainly, bans and other restrictions 10 on registration would affect the commercial growth of 11 the company in its sale of paraquat; you'd agree with 12 that? 13 MR. NARESH: Objection; foundation, scope. 14 THE WITNESS: Yes. 15 BY MR. DICKENS: 16 Q. It states: 17 "Bans in commercially small but 18 influencing regions or countries like EU may strongly 19 impact registrations in other regions or countries - 20 either directly or indirectly via pressure from NGOs." 21 Right? 22 A. Yes. 23 Q. And in response -- well, those bans in 24 those commercially small, influencing countries, one 25 of the tactics that was used by Syngenta was not to	481 1 to ask, and so, therefore, we view this particular 2 question as outside of the scope. 3 If Dr. Botham has an answer to the 4 questions, he can, of course, answer them, but this is 5 another example where our view is this is outside of 6 the scope of the notice. 7 THE WITNESS: And I can only agree with 8 that. I was not asked to do any particular work on 9 that particular question, so I can't answer it, I'm 10 afraid. 11 BY MR. DICKENS: 12 Q. You did review this document in 13 preparation for today's deposition? 14 A. I read through this document, yes. 15 Q. And you read the particular paragraph that 16 we're looking at now? 17 A. Yes. 18 Q. Okay. Now, this document, you'd agree, 19 when it says, "Such registrations must be kept 20 tactically," that that's referring to the prevention 21 of bans in commercially small but influencing regions, 22 right? 23 MR. NARESH: Same objections as before. 24 BY MR. DICKENS: 25 Q. Is that your understanding?
480 1 seek re-registration there so that a ban never 2 occurred, right? 3 MR. NARESH: Objection; scope, foundation. 4 THE WITNESS: Well, you're talking about 5 what might have been part of the regulatory strategy. 6 I was never involved in that, so I can't say, yes, 7 of course, that's what happened, I don't -- because 8 I don't know. 9 BY MR. DICKENS: 10 Q. Okay. And you're here today to speak on 11 behalf of Syngenta, correct? 12 A. Yes. 13 Q. And you don't know whether or not Syngenta 14 tactically made decisions to not seek re-registration 15 in order to prevent bans or other restrictions on 16 their registrations in influencing countries? 17 MR. NARESH: And let me just make -- 18 before you answer, let me just make my record. 19 Again, this is another example where we 20 asked counsel if they had specific questions, given 21 the volume of documents in the notice. If they had 22 specific questions that they'd like to ask about 23 documents, to identify those. 24 Those questions that were just asked 25 were not identified as questions that counsel intended	482 1 A. As I say, I don't know exactly what the 2 implication of being written in that way may have 3 been. I would need to ask further questions of my 4 regulatory specialists and I didn't do that. 5 Q. Well, certainly not seeking registrations 6 tactically to avoid negative information with respect 7 to paraquat, that was a long-standing tactic or 8 regulatory strategy implemented by Syngenta for years 9 at this stage, right? 10 MR. NARESH: Scope, foundation. 11 THE WITNESS: Again, I cannot comment on 12 that. I have not investigated that in the level of 13 detail that would be required to answer that question. 14 MR. DICKENS: Keep that close to you. 15 I'm going to go ahead and mark Exhibit 69 for the 16 record. 17 (Exhibit 69 marked for identification.) 18 MR. NARESH: What's the topic? Do you 19 have the topic number handy? 20 MR. DICKENS: Yes, sorry. 24. 21 MR. NARESH: Thank you. 22 BY MR. DICKENS: 23 Q. I've handed you this exhibit, and the 24 second page actually identifies what it is. It's a 25 "Paraquat Vision Workshop," in April of 2000.

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483 1 Do you see that? 2 A. I do. 3 Q. And it includes an attendees workbook, 4 right? 5 A. It does. 6 Q. And this is a document you reviewed in 7 preparation for today's deposition, right? 8 A. I did look at this one, yes. 9 Q. And there's a list of delegates that are 10 included on the page ending in 998. 11 Do you see that? 12 A. Yes, I do. 13 Q. And these were employees of, and I'll use 14 it broadly, Syngenta, correct? 15 A. So we're in 2000, so, yes, we are talking 16 about Syngenta. 17 Q. And we've talked about some of these 18 individuals who were delegates. Ian Wheals, Geoff 19 Willis, Clive Campbell, those are individuals you 20 recognize, right? 21 A. They are. 22 Q. I want to turn your attention to the 23 page ending 9015. Once again, this document was 24 created in the year 2000, right? 25 A. Yes.	485 1 Q. Okay. And, essentially, it's akin to 2 resigning from a job before being fired, right? 3 MR. NARESH: Objection to the form. 4 THE WITNESS: Well, that's your phrase. 5 It wouldn't be mine. But, again, I'd have to say, 6 you know, regulatory strategy at the next level of 7 detail beyond what it says here is not something that 8 I believe that I needed to ask more questions about. 9 BY MR. DICKENS: 10 Q. Well, certainly, the company decided not 11 to seek re-registration in the EU because of various 12 concerns, including toxicity concerns, right? 13 A. No, that was much more complicated than 14 that. So, that, I do know because I did have a look 15 at that. There was a lot of work done on whether we 16 should seek re-registration in the EU post the CFI 17 ruling, and a lot of detail about what we would need 18 to do to achieve that registration and whether it was 19 the right thing to do, that was thought through very 20 carefully. 21 Q. Okay. And one of those issues with 22 seeking re-registration is additional toxicity data 23 would need to be -- or would be required for 24 submission in that re-registration request, right? 25 A. Yes, that's correct. The record certainly
484 1 Q. This is "Paraquat Improvement Projects 2 Review - Regulatory Strategy." 3 Right? 4 A. Yes. 5 Q. Number one: 6 "Defend all existing registrations in 7 important markets (commercial or strategic in terms of 8 possible regional or global regulatory influence)." 9 A. Yes. 10 Q. Now, the second one states: 11 "Strategically withdraw on a proactive 12 basis from commercially/strategically unimportant 13 markets where paraquat registrations are under threat 14 and voluntary withdrawal can be achieved without 15 resulting in notification under PIC." 16 Right? 17 A. Yes. 18 Q. And that is the same sentiment that was 19 stated in the previous exhibit from 2007, correct? 20 A. There's certainly some similarity in that. 21 Q. That Syngenta would withdraw on their own, 22 proactively, if paraquat registrations were under 23 threat so that they wouldn't end up on the PIC list or 24 have other issues occur, right? 25 A. That's what that says.	486 1 shows that. Some of that would be because the 2 requirements of the EU for registration of a -- or 3 re-registration of a pesticide had changed over a 4 period of time, so some studies would need to be 5 updated and additional studies may be required. 6 And that -- those studies are listed in 7 some of the documents that I did read. 8 Q. And one of the concerns with seeking 9 re-registration would be the threat of generating 10 critical data on paraquat? 11 A. Whenever you generate data on toxicology 12 studies, or even environmental studies, there's always 13 the danger that you will find unexpected findings 14 because one of the principles, as we said before, 15 of doing especially toxicology testing is that the 16 guidelines often ask you to do these at very high 17 doses. 18 So you may find things that you didn't 19 find before. They may not be of relevance to human 20 health, but they can have implications for regulatory 21 status. 22 Q. And one of the strengths or pros of not 23 seeking re-registration in the EU was there was no 24 threat of generating that critical data on paraquat? 25 A. If we didn't go for re-registration?

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487 1 Q. Correct. 2 A. Of course, yes. 3 Q. And so the -- now, did the US EPA -- 4 the US EPA did not require Syngenta to conduct new 5 toxicology studies required in Europe, did they? 6 A. At that -- 7 MR. NARESH: Objection -- 8 THE WITNESS: Sorry. 9 MR. NARESH: Objection to the scope and 10 foundation. 11 THE WITNESS: Yeah. No, not at that time. 12 BY MR. DICKENS: 13 Q. Or at the time of re-registration? 14 A. Yes, yes, you're right. Yes. 15 Q. Okay. So Europe would have been -- 16 Europe, as a regulatory agency, would have required 17 additional toxicology or toxicity studies in order to 18 get the product re-registered in the EU, right? 19 A. That was the view and that was presumably 20 based on a proper analysis by the specialists as to 21 what -- whether they would be needed and what they 22 would be. 23 Q. And that's different from the United 24 States, who did not require that data? 25 A. Correct.	489 1 influential..." 2 Because the headquarters of Syngenta was 3 located there. 4 Right? 5 A. That's what it says. 6 Q. Did Syngenta ultimately seek 7 re-registration of paraquat in Switzerland? 8 A. I don't believe it did. 9 Q. Okay. Did -- CTL's laboratories were in 10 the UK? 11 A. Yes. 12 Q. Can Syngenta sell paraquat in the UK? 13 A. Not -- 14 MR. NARESH: Scope, foundation. 15 Go ahead. 16 THE WITNESS: Not now, no. 17 BY MR. DICKENS: 18 Q. Turn the page, ending in 932. The first 19 bullet point on that page: 20 "Re-submission of paraquat in EU after 21 annulment of the Annex I inclusion directive by the 22 European Court of First Instances on July 11, 2007." 23 And that's the court decision we've been 24 discussing, right? 25 A. It is, yeah.
488 1 Q. So there was no threat in generating 2 negative critical data in seeking re-registration in 3 the United States, correct? 4 A. Any data which are generated in one region 5 -- and, again, especially toxicology data, which 6 always have, if you like, potential global 7 implications, there's always the danger that if you 8 get findings which are of the sort that I just 9 described, that they could have an implication for 10 registrations elsewhere in the world. 11 Q. I'm going to ask, can we go back to the 12 previous document. Keep that other one near you. 13 I'm sorry for jumping around. 14 But the prior exhibit, if we can turn to 15 page ending in 931. At the very bottom of the page, 16 there's: 17 "Growth potential through strategic or 18 tactical registrations (Strategy, outcome and SWOT 19 analysis)." 20 Do you know what SWOT is referring to? 21 A. Strengths, Weaknesses, Opportunities and 22 Threats. 23 Q. And: 24 "A re-registration of paraquat in 25 Switzerland recognized as strategic and possibly	490 1 Q. And then there is: 2 "Submit paraquat as new a.i. ..." 3 And that's "active ingredient"? 4 A. Yes. 5 Q. "... one representative tractor and 6 knapsack use each." 7 Is stated there, right? 8 A. Yes. Now we are talking about detailed 9 regulatory approaches to registration and 10 re-registration, so this was one option: to submit as 11 if it was a new active ingredient and, hence, what 12 studies would be needed. 13 Q. And then there are some probable 14 requirements listed, right? 15 A. Yes. 16 Q. And one of those is a full review of the 17 Parkinson's issue? 18 A. Correct. 19 Q. And then "require neurotoxicity studies" 20 is listed there? 21 A. Yes, that's right, because neurotox 22 studies were now becoming more a part of regulatory 23 requirements worldwide, actually. 24 Q. Okay. And then for this consideration of 25 "submit paraquat as a new active ingredient,"

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491 1 underneath this chart they list some strengths and 2 weaknesses, right? 3 A. Yes. 4 Q. And one of the weaknesses that Syngenta 5 lists is: 6 "New OPEX data on knapsack use need to be 7 included - very unlikely that knapsack will be 8 accepted." 9 Right? 10 A. Yes. 11 Q. Okay. And do you know whether or not 12 knapsack use is currently permitted in the United 13 States? 14 MR. NARESH: Scope, foundation. 15 THE WITNESS: I think it is, yes. 16 BY MR. DICKENS: 17 Q. Under "Threats," one of the threats for 18 seeking to submit paraquat as a new AI and seek 19 re-registration, or registration of paraquat in the 20 EU, was: 21 "Any new study may generate data 22 potentially leading to more critical endpoints (tox) - 23 will also need to be considered in RoW." 24 Right? 25 A. Yes.	493 1 Opportunities and Threats if Syngenta were to "Give up 2 paraquat in EU - no resubmission of paraquat as a new 3 AI," right? 4 A. Yes. 5 Q. And that's ultimately what Syngenta 6 decided to do, correct? 7 A. It is. 8 Q. And one of the strengths for not seeking 9 registration of paraquat in the EU was there was 10 no threat of generating critical data, right? 11 A. That's correct. 12 Q. And one of the weaknesses was: 13 "Communication of a non-defense of 14 paraquat [would need] to be carefully phrased." 15 Right? 16 A. Yes. And that was to ensure that we 17 were not doing this because -- for example, we felt 18 that we were insecure about our position on the safety 19 of paraquat, because this is nothing to do with 20 thinking that paraquat is not safe and shouldn't be 21 registered. 22 Q. Now, not wanting to generate critical or 23 new toxicity endpoints, Syngenta undertook efforts to 24 design studies in a way in which they would not need 25 to be reported to regulatory agencies, correct?
492 1 Q. And that's what you were discussing 2 before, is new studies could always potentially lead 3 to new toxicity endpoints? 4 A. That's exactly what I was saying. 5 Q. And that is a threat to paraquat if they 6 were to submit that to the EU? 7 A. That is right, yes. Yes. 8 Q. And that will also need to be considered 9 in RoW. Can you tell me what RoW is referring to? 10 A. Rest of the World. 11 Q. So that will also need to be considered -- 12 do you know, when they say "will also need to be 13 considered in the rest of the world," what that's 14 referring to? 15 A. I think it means that it's the new study 16 data which generates those kind of unexpected effects 17 would be -- could potentially have implications, not 18 just to registration in Europe but to continued 19 registration elsewhere in the world. 20 Q. So it would be a threat not only to the EU 21 but possibly a threat to all other locations in the 22 rest of the world, right? 23 A. That's what that says. 24 Q. Now turn to page ending 934. 25 Now, there's some Strengths, Weaknesses,	494 1 A. That is generally not the case. I know 2 that their records shows, because I've been reminded 3 of this in the last couple of months, that people said 4 we need to be cognizant of the fact that findings may 5 need to be reported, and for example under 6(A)(2) as 6 we were talking about. 7 But in my experience, the science always 8 -- and the needs of trying to understand the 9 scientific issue would nearly always prevail. 10 Q. Well, Syngenta certainly elected not to 11 conduct certain studies out of concern or fear that it 12 would generate negative information, right? 13 MR. NARESH: Scope, foundation. 14 THE WITNESS: I know that the record 15 suggests that, but I think if you take some of those 16 statements and then look in a broader context, it's 17 generally true that we still continued to pursue the 18 line of research that was being talked about. 19 MR. NARESH: Are you done with 68 and 69? 20 MR. DICKENS: We are, yeah. 21 I'll hand you Exhibit 70 for the record. 22 (Exhibit 70 marked for identification.) 23 MR. DICKENS: This is topic 35. 24 MR. NARESH: Thank you. I've trained you. 25 MR. DICKENS: Yeah, I'm getting there.

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495 1 BY MR. DICKENS: 2 Q. Before we get to this document, Doctor, 3 is Syngenta currently undertaking any neurotoxicity 4 studies on paraquat? 5 MR. NARESH: Scope, foundation. 6 THE WITNESS: No. 7 BY MR. DICKENS: 8 Q. All right. What I've handed you is an 9 email chain from 2001. 10 Do you see that? 11 A. Yes. 12 Q. And I want to start on the email that 13 begins on the bottom of page 2, titled "Paraquat PPE 14 Issues, Conference Call" -- 15 A. Yes. 16 Q. -- "April 25, 2001 Notes." 17 Right? 18 A. Yes. 19 Q. Okay. On the next page, page 291, in the 20 first bullet point, it notes: 21 "California is uncomfortable with our 22 paraquat inhalation exposure facts, and perhaps after 23 things are settled with EPA on the dust mist filter 24 PPE requirements we can address California issues." 25 Do you see that?	497 1 Right? 2 A. Yes. 3 Q. Now if we can turn back to the first page, 4 Ian Wheals responds: 5 "Equally, I would strongly resist ever 6 doing such a study." 7 Right? 8 A. Yes. 9 Q. The last sentence: 10 "We do not want to do anything to weaken 11 EPA resolve in the conclusion they reached in the 12 EPA RED about the lack of relevance of this route of 13 exposure for Gramoxone." 14 Correct? 15 A. Yes, yes. 16 Q. So Ian Wheals is saying, "I would urge 17 the company not to do this study because we don't want 18 the EPA looking at inhalation toxicity again," right? 19 A. I think this is saying that to do 20 something like a 28-day inhalation study would be a 21 great example of what we've been talking about, where 22 you may find effects which, again, because of the 23 nature of the study, repeat exposure, high doses and 24 so on, which are effectively not really relevant to 25 the existing position of the EPA and ourselves on the
496 1 A. Yes. 2 Q. And that's, once again, something we 3 discussed about as there were some concerns over 4 inhalation and that ultimately led to adding a 5 respirator on the labeling, correct? 6 A. That's right. 7 Q. And that labeling was suggested by both 8 California and the EPA, right? 9 A. Yes. 10 Q. And Syngenta fought against the inclusion 11 of that labeling, right? 12 A. I think that they -- the view was that 13 that was not necessary, but the concerns of California 14 over nosebleeds meant that a decision was taken that a 15 need for a respirator would be put back on the label. 16 Q. Okay. And then up above that, there's 17 reference to a 28-day inhalation study, right? 18 A. Yes. 19 Q. Okay. And then if you can turn to the 20 email on the previous page, it's an email from an 21 Andreas Stehli, May 3, 2001, right? 22 A. Yes. 23 Q. And it asks: 24 "Is the 28-day inhalation to be scheduled 25 ex Basel (i.e., by me)? What's the target date?"	498 1 risk of paraquat from inhalation. 2 Q. Doing a 28-day inhalation study would risk 3 generating critical tox data, right? 4 A. It's an example of what we've been talking 5 about. And it may not have been needed in order to 6 continue to maintain our understanding of the safety 7 of paraquat. 8 Q. In your notes, Exhibit 1, that you brought 9 with you today, under tab 1 you actually list out 10 inhalation studies on paraquat, and that's on page 5. 11 A. Yep. 12 Q. Okay. And you list three inhalation 13 studies, right? 14 A. Yes. 15 Q. All would have been done by this point of 16 this email in 2001, correct? 17 A. That's right. 18 Q. Those are the only inhalation studies that 19 you were able to identify in your review? 20 MR. NARESH: That's a mischaracterization. 21 MR. DICKENS: Okay. 22 BY MR. DICKENS: 23 Q. How did you generate this document with 24 respect to these inhalation studies? 25 A. These were some of -- some -- some of the

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499 1 other studies, representative examples of the key 2 studies. We've done more than 1200 safety studies on 3 paraquat altogether, so this is not an exhaustive 4 list. There are many more inhalation studies, for 5 example, that have actually been done. 6 Q. Okay. So why did you -- what was the 7 purpose of identifying these three inhalation studies? 8 A. Well, as I say, it's mainly as a prompt 9 for me for this purpose, to be -- to allow me to 10 identify some of the key studies. Not all of them; 11 some of the key studies that we've done over a period 12 of time. 13 Q. So you determined that these were the key 14 inhalation studies on paraquat? 15 A. They are key, but there are others. 16 Q. Okay. And two of the three key studies 17 you identified were undertaken by Industrial Bio-Test, 18 right? 19 A. Yes, and they're included to help me to 20 remember that the inhalation studies were part of that 21 IBT set of studies, the few studies that they did, 22 which had this controversy we described. Not to say 23 that they were key, if you like, in terms of our 24 assessment of the risk of paraquat from inhalation 25 exposure.	501 1 Q. And Dr. Ray is writing to notify those at 2 the company that he would like to be able to 3 assay paraquat in brain tissue, right? 4 A. Yes, that's correct. 5 Q. Okay. And he is asking for some 6 information about analytical model, right? 7 A. That's right. 8 Q. And he mentions some work that one of his 9 workers, or postdoctoral workers had already done in 10 paraquat, right? 11 A. That's right, yes. From Thailand, yes. 12 Q. And he's reporting that there's "some very 13 clear positive neurochemical and neurobehavioral 14 results with paraquat" within those studies. 15 A. And these were animal studies, yes. 16 Q. And in those studies, the neurochemical 17 effects were seen in neocortex, hypothalamus, striatum 18 but not elsewhere, right? 19 A. Yes. 20 Q. They were dose-dependent, right? 21 A. Yes. 22 Q. They occurred after a single dose, 23 correct? 24 A. Yes. 25 Q. He writes in the next paragraph --
500 1 Q. Okay. Did Syngenta ever undertake the 2 28-day inhalation study in 2001, to your knowledge? 3 MR. NARESH: Scope, foundation. 4 THE WITNESS: I've not got evidence of 5 such a study. 6 MR. DICKENS: You can put that aside. 7 MR. NARESH: And just so you have the 8 record on this, tab 1 was an exhibit in his prior 9 deposition. 10 MR. DICKENS: Okay. 11 MR. NARESH: It was a deposition -- it was 12 marked in his prior deposition, just tab 1 of 13 Exhibit 1, so it will be in the record twice. 14 MR. DICKENS: Okay, understood, thank you. 15 (Exhibit 71 marked for identification.) 16 MR. DICKENS: Go ahead and mark Exhibit 71 17 for the record. Topic 58 in the Notice of Deposition. 18 BY MR. DICKENS: 19 Q. And Exhibit 71 is an email from a 20 David Ray to Bruce Woollen, copying Nick Sturgess, 21 regarding a paraquat analysis, right? 22 A. Yes. 23 Q. This is in April -- on April 7, 2003, 24 right? 25 A. That's right.	502 1 MR. NARESH: Complete -- objection on 2 completeness. 3 BY MR. DICKENS: 4 Q. He goes on to say: 5 "I am well aware that such results are not 6 the sort of thing Syngenta wants to see." 7 Right? 8 A. His phrase. Yes. 9 Q. And the understanding is that's his phrase 10 because they are showing neurochemical and 11 neurobehavioral results in animal studies, correct? 12 A. Indeed, and -- but that's fine, we don't 13 have a problem with getting this. He may think that 14 we may not want to see it, see these kind of studies, 15 but, actually, in practice we did like to see this 16 because, again, we were trying to build up an 17 understanding of what effects paraquat may have. 18 Q. So you wanted Dr. Ray to be successful in 19 his studies in order to identify the brain 20 concentration of paraquat in order to produce these 21 particular effects, right? 22 MR. NARESH: Form. 23 THE WITNESS: We were open to the idea 24 that we could contribute to this particular bit of 25 research by using our expertise in analyzing paraquat,

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503 1 again as part of checking the robustness of the 2 findings, I guess you would say. 3 BY MR. DICKENS: 4 Q. Dr. Ray says: 5 "When we know what the brain concentration 6 of paraquat needs to be to produce these effects, then 7 we will be better placed to decide on whether such 8 findings are relevant to man or whether they are a 9 peculiarity of leaky-brained rodents." 10 Right? 11 A. Absolutely. There are a number of 12 explanations is what he is suggesting there. 13 Q. So part of the reason of why Dr. Ray 14 stated to Syngenta he's undertaking these studies is 15 in order to determine what their relevance is to man; 16 you'd agree with that? 17 A. Yes. 18 Q. And he states at the last paragraph: 19 "... the best solution for us would be to 20 have access to radiolabeled paraquat." 21 Right? 22 A. Yes. 23 Q. And you'd agree that radiolabeled paraquat 24 would allow and would be the best analytical method in 25 order to determine how much paraquat is getting to the	505 1 A. That's right. 2 Q. And so Dr. Sturgess is responding to 3 Dr. Ray's request and saying this is a worrying 4 development; and a worrying development for Syngenta, 5 right? 6 A. Look, I mean, when Nick Sturgess uses 7 phrases like "worrying development," it's, again, part 8 of what scientists think. When a hypothesis is being 9 explored, if there's more evidence that suggests that 10 the hypothesis might be correct, the phrase "worrying" 11 can be used, but that's really what is meant here: 12 These data could have been suggesting that there's 13 further evidence that paraquat has an effect on the 14 brain. 15 Q. Well, when you say it's what scientists 16 think, scientists with the company involved with the 17 actual pesticide or other chemical that's being 18 tested, right? 19 MR. NARESH: Form. 20 THE WITNESS: I know where you're going 21 and I have to say that working in the environment, the 22 same environment that Nick Sturgess did, it was very 23 rare, very rare indeed, for us to have conversations 24 about the commercial importance of, in this case, 25 paraquat.
504 1 brain? 2 A. It's a more straightforward way of trying 3 to understand that question. There are other methods, 4 but it's certainly one which is -- has got probably 5 the best utility in this situation. 6 MR. DICKENS: I'll hand you Exhibit 72. 7 (Exhibit 72 marked for identification.) 8 BY MR. DICKENS: 9 Q. Exhibit 72 is some internal correspondence 10 responding to David Ray's request, sent on April 7, 11 2003, right? 12 A. Yes. 13 Q. Nick Sturgess says at the top of the 14 email: 15 "This is a worrying development since they 16 have clearly generated a lot of data already in the 17 rat." 18 Right? 19 A. Well, referring, I assume, to what we've 20 just been looking at. 21 Q. Correct, and, actually, that email is 22 the first email in this particular email chain on 23 page 2, right -- 24 A. Yes. 25 Q. -- the one we just looked at?	506 1 The discussions that we had were always 2 about the science and whether the science was actually 3 going to be moving more towards -- remember that 4 phrase "freedom to sell"? Our role was to understand 5 is there a real health effect, and so "worrying" in 6 that sense is not saying, "well, we're worried about 7 sales on paraquat." That wasn't on Nick's mind, 8 I don't think. It would be that maybe this is another 9 bit of evidence that could eventually, with other 10 evidence, lead to that weight of evidence changing. 11 BY MR. DICKENS: 12 Q. Okay. It's worrying to the consideration 13 that paraquat may be associated with Parkinson's 14 disease? 15 A. Of course. That's what -- the hypothesis 16 that was being tested. 17 Q. And so the data that's been generated by 18 that outside lab, David Ray, could be worrying to the 19 extent that it found an association between paraquat 20 and concentrations within the brain? 21 MR. NARESH: Form. 22 THE WITNESS: Yes. I mean, that's 23 obviously one part of the information that was being 24 asked for to be able to understand what concentrations 25 of paraquat were found in the brain that may have been

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507 1 linked to the effects that have been described. 2 BY MR. DICKENS: 3 Q. And scientific literature linking paraquat 4 to neurochemical or neurobehavioral effects could 5 affect Syngenta's freedom to sell? 6 A. Mmm, and this was not the first time that 7 such effects that you've just described had been seen 8 in the scientific literature. So some of those early 9 studies that we talked about of the mouse model using 10 IP dosing, they weren't just looking at the pathology 11 in the brain; they were also looking at dopamine 12 levels, effect on movement and coordination in the 13 animal. 14 So, of course, these are all bits of 15 evidence that were being looked at and reviewed to 16 understand their significance. 17 Q. And so, with that said, then, the negative 18 neurotoxicity data linking paraquat to neurotoxicity, 19 that would, in turn, result in a -- in issues with the 20 freedom to sell? 21 MR. NARESH: Form. 22 THE WITNESS: It would continue to ask 23 questions about how strong that weight of evidence is 24 that could at some point say we no longer feel happy 25 about our freedom to sell, that there may be a genuine	509 1 radiolabeled paraquat that he was requesting? 2 A. I just -- I would need to be reminded of 3 whether that is -- there's documentation of that, but 4 that's quite possible. 5 MR. DICKENS: I'll hand you 73. Still 6 topic 58. 7 (Exhibit 73 marked for identification.) 8 THE WITNESS: Okay. Now I'm reminded. 9 Thank you. 10 BY MR. DICKENS: 11 Q. Okay. So you understand that Syngenta 12 did not ultimately provide Dr. Ray with the 13 radiolabeled paraquat he was requesting? 14 A. Right. Thank you for reminding me because 15 I thought this was what the case was: It was not that 16 we were wanting to stop that line of research, as it 17 says here. We were still very keen to collaborate, 18 exactly as I was saying before. There was a very 19 practical reason, which is, essentially, we didn't 20 really have enough of that material, radiolabeled 21 material available. 22 Q. Okay. Now, the basis for telling Dr. Ray 23 that you could not provide him with radiolabeled 24 paraquat is there wasn't a sufficient amount in stock, 25 right?
508 1 effect on human health. 2 These -- at this stage, we were way away 3 from that. These were very preliminary studies in 4 animal models. And so worrying they may have been, 5 but worrying to the extent that, you know, we're down 6 here and we need a lot more evidence to get there. 7 BY MR. DICKENS: 8 Q. But freedom to sell within the company, 9 that's also affected by outsiders outside of Syngenta, 10 right? 11 A. Well, that's what I'm saying, yes, I mean 12 -- and that's why we had a very open process for 13 understanding that outside science. And, as you can 14 see here, always a willingness, if we could, to help 15 and to collaborate. 16 Q. But you did not ultimately, openly, 17 willingly collaborate and assist Dr. Ray, did 18 Syngenta? 19 A. Well, I don't know exactly what happened 20 with these -- with this, and the whole interaction 21 with David Ray, I think that became a little bit less 22 obvious to me over time, I think as Dr. Ray was 23 beginning to retire, so not everything was finally 24 pursued to what may have been the intended end. 25 Q. You didn't provide David Ray with the	510 1 A. That's right. 2 Q. And what is radiolabeled paraquat? 3 A. It is the attachment to one of the carbon 4 atoms in paraquat of a radiolabeled carbon atom so 5 that you can detect where the paraquat goes to. 6 Q. Okay. So it's a process of attaching 7 a carbon atom to paraquat, right? 8 A. It's a bit more complicated than that, 9 but, yes, that's basically it. 10 Q. And that was done internally at Syngenta, 11 right? 12 A. We did produce our own radiolabel 13 compounds in some cases, yes. 14 Q. So, certainly, Syngenta had the capability 15 to produce more radiolabeled paraquat had it chosen to 16 do so? 17 A. Yeah, and I don't know what the 18 constraints were on this at the time. I mean, there 19 are many radiolabel compounds that are produced all 20 the time for -- not just on paraquat, and therefore 21 there is always a capacity constraint, and it may be 22 that it was something as simple as that. 23 That's, again, a level of detail which 24 I don't have at my fingertips. 25 Q. Are you familiar with a Dr. Ted Lock?

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511 1 A. I am. 2 Q. Are you aware that Dr. Ted Lock told 3 Dr. Ray that they could not provide radiolabeled 4 paraquat because paraquat was "too business 5 sensitive"? 6 A. I don't know -- I didn't know or don't 7 know that Dr. Lock said that. 8 MR. DICKENS: Move on to 74. 9 (Exhibit 74 marked for identification.) 10 MR. DICKENS: Which is topic 64. 11 BY MR. DICKENS: 12 Q. This document is an email from Louise 13 Marks to Mike Clapp on April 6, 2004. 14 Do you see that? 15 A. I do. 16 Q. And she's discussing a new paraquat study, 17 right? 18 A. That's right. So this was at the start of 19 the studies that we were talking about earlier. 20 Q. She says, first full paragraph: 21 "As Nick mentioned to you, we decided not 22 to include a 3 times a week paraquat group as this has 23 [...] previously been reported in the literature so 24 could therefore lead to a PRF if effects were 25 observed."	513 1 a PRF, right? 2 A. It's a kind of technical point, but, yes, 3 it was one of the considerations. We didn't need to 4 do that whilst we were still in the investigation 5 phase. It wasn't compromising the scientific approach 6 that we were trying to take. 7 Q. You'd agree that certainly nothing would 8 have prevented Syngenta from providing an explanation 9 in a report to the regulatory agency as to a belief 10 that the amount of paraquat that was used in the study 11 led to toxic effects versus a true effect, if you 12 will? 13 MR. NARESH: Objection to form, scope, 14 foundation. 15 THE WITNESS: I'm not quite sure 16 I understand the question. 17 BY MR. DICKENS: 18 Q. Yeah, let me ask it a different way. 19 There was nothing that would have precluded Syngenta 20 from providing its own explanation as to the results 21 in a PRF to the regulatory agency? 22 A. Had we done the study, you mean? 23 Q. Correct. 24 A. Of course. But if you -- it seemed to 25 make sense to us, as we've discussed quite a few
512 1 Right? 2 A. Yes. 3 Q. And PRF is what we discussed before, 4 Potentially Referable Finding, correct? 5 A. Yes. 6 Q. That's where information is submitted to 7 a regulatory agency, right? 8 A. That's correct. 9 Q. And so the company decided to not include 10 a particular group in the study because if negative 11 effects were observed, they would not have to submit 12 it through a PRF? 13 A. And there were two other reasons why this 14 was the case. One is, I articulated here. The more 15 paraquat you gave to these animals three times a week, 16 rather than once or twice a week, the higher the 17 likelihood that you may get nonspecific effects. 18 That's what the systemic toxicity could result in. 19 And, secondly, in order to -- as trying to understand, 20 which is what we were doing here, if we can replicate 21 the findings of others, it wasn't necessary to do it 22 three times a week; so let's do a study where 23 everything works in order to answer our question. 24 Q. Okay. In this particular study, if 25 effects were observed, it therefore would have led to	514 1 times, actually, that especially when you're doing 2 scientific research and not a regulatory study, do a 3 study that is going to give you as clear an answer to 4 your question as possible and don't compromise that, 5 in this case, by paraquat's toxicity leading to 6 findings which may be nothing to do with 7 neurotoxicity. 8 MR. DICKENS: Let's look at another 9 example. I'll hand you Exhibit 76. 10 THE STENOGRAPHER: 75. 11 MR. NARESH: 75. 12 MR. DICKENS: 75 it is, and this is 13 topic 64. 14 (Exhibit 75 marked for identification.) 15 BY MR. DICKENS: 16 Q. I'm going to start on the email that 17 begins at the very bottom from Barry Elliott to 18 Ian Wheals, September 11, 2006, and goes on to the 19 second page. 20 Do you see that? 21 A. I do. 22 Q. And this is an email chain that you 23 reviewed in preparation for the deposition? 24 A. It is. 25 Q. And the subject of the email is "Paraquat

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1 and lit claims of neuronal effects in the rat." 2 Right? 3 A. Right. 4 Q. And at this point, there were claims in 5 the literature that there were neuronal effects seen 6 in not only the mouse but the rat as well? 7 (Stenographer clarification.) 8 BY MR. DICKENS: 9 Q. At this time, in 2006, there were claims 10 in the literature showing neuronal effects not only in 11 the mouse but also in the rat? 12 A. The majority of findings were in the 13 mouse, but, yes, but there were some in the rat. 14 Q. The email starts: 15 "Ian, regarding previous correspondence on 16 this issue and concerns over PRF status." 17 Right? 18 A. Yes. 19 Q. It says: 20 "There is now a literature claim of 21 effects of paraquat that allow us to undertake a 22 repeat such as to make a finding, not a new finding 23 (unless of course we have a greater magnitude of 24 effect)." 25 Right?	515 517 1 loss. Effects on dopamine would then become, if you 2 like, a downstream consequence of that. 3 In experiments, sometimes you say let's 4 make sure we focus on the key issue, and the key issue 5 was substantia nigra neuronal cell loss. 6 Q. If Syngenta did measure striatal dopamine 7 levels and there was a decrease, that would result in 8 the PRF. You'd agree? 9 A. It may have done. I mean, we'd have to 10 look -- again, look at what was already in the 11 literature at that time. 12 Q. Well, the authors of this study, 13 Barry Elliott specifically, says if we do this and 14 then find a decrease, it would be a PRF, right? 15 A. Well, that was their view. I mean, I 16 would -- they -- I don't remember because this is, 17 again, quite some time ago. I mean, I assume that 18 they did actually make that statement in the light of 19 what the existing literature was saying, yes. 20 Q. And, in fact, they say: 21 "Scientifically, we should measure both 22 parameters." 23 Right? 24 A. Well, yes, you could argue that, but 25 I think that, again, when you're trying to do any kind
516 1 A. Yes. So, again, what we're trying to do 2 here is to say what is the basis for wanting to do 3 this study, and the basis of trying to do the study 4 was part of that issue we discussed several times now, 5 which is this effect, whether it's in the mouse or the 6 rat, replicable, does it happen in a different lab. 7 So the scientific question can be 8 addressed by doing a study in exactly the same way as 9 it was done by another lab. 10 Q. It states: 11 "The study examined [the] neuronal cell 12 count only and not the usual accompanying parameter of 13 striatal dopamine levels. We would normally measure 14 this in order to examine the consequences of any cell 15 loss." 16 That's what's being said here, right? 17 A. It does say that, yes. 18 Q. Okay. And so Syngenta, as a company, 19 if conducting these studies, the typical way they 20 would do it would be to measure the striatal dopamine 21 levels in order to determine whether or not there's 22 a consequence of cell loss? 23 A. Right. But the decision was taken here 24 that the first key question was do we -- are we able, 25 or not, to replicate the finding of neuronal cell	518 1 of scientific experiment, it's always best to take one 2 step at a time because if there is no -- if a finding 3 can't be replicated and we don't see neuronal cell 4 loss, then, you know, it's highly unlikely there would 5 have been an effect on dopamine. 6 So, you know, you do the study that gets 7 to the key question. 8 Q. Okay. You say you could argue that. It's 9 not an argument. That's Barry Elliott who says we 10 should measure both parameters scientifically, right? 11 A. There are always arguments about what -- 12 you know, there are many other things which you could 13 do scientifically. I mean, you could have argued, 14 I'm sure, if we'd wanted to, you should -- we should 15 also look at the behavior of those animals, you know, 16 are they -- is there movement being affected, as 17 people have done in rodent models before. 18 But we decided to stick with the key 19 parameter of neuronal cell loss in the brain. 20 Q. Barry Elliott was the one responsible for 21 coming up, in some part, with the design of this 22 particular study, right? 23 A. No, Barry Elliott was the project manager. 24 He wasn't the key scientist. So that would be the 25 responsibility of Nick and Louise -- Nick Sturgess and

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519 1 Louise Marks. 2 Q. And then Barry writes to Louise Marks, in 3 the email on the first page: 4 "Please take all steps to ensure no PRF 5 except re the cell count magnitude aspect." 6 Right? 7 A. Yep. It's basically saying, look, we 8 agree we should do this, this study. Let's stick to 9 the cell counting, the assessment of nigra striatal 10 dopamine -- dopaminergic cell loss, and recognizing, 11 as had been said earlier, that of course if there is a 12 greater degree of change in that, or any, then that 13 could be potentially referable. 14 So it's not that we stopped doing it 15 because we were afraid of all eventualities of a PRF. 16 Q. It's saying don't do something 17 scientifically we believe we should do because we 18 don't want a PRF to report to the regulatory agencies? 19 A. No. I'll say it again, it's not -- if you 20 can do a study which meets the scientific need and 21 doesn't create data which you then have to spend a lot 22 of time trying to explain unnecessarily because it 23 actually has no bearing on human health, then why do 24 it? 25 You can answer the question scientifically	521 1 BY MR. DICKENS: 2 Q. Exhibit 76, emails from July 2015, related 3 to ICAMA, correct? 4 A. Yes. 5 Q. And that is the regulatory agency in 6 China? 7 A. It is. 8 Q. Is paraquat permitted to be sold in China? 9 A. It is not. 10 Could I just ask, was this in my 11 documents? 12 Q. It should have been, and specifically 13 identified in topic 28. 14 A. It may have been and I just don't recall 15 this one, but I just thought I'd double-check. 16 MR. NARESH: It's listed in there -- 17 THE WITNESS: Yeah. 18 MR. NARESH: -- so it was probably in 19 your -- 20 THE WITNESS: Yeah. Okay, that's fine. 21 MR. NARESH: -- materials. 22 THE WITNESS: No problem. 23 MR. NARESH: If you don't remember -- 24 I know it's been two months -- 25 THE WITNESS: Yeah, I mean --
520 1 in the way in which, ultimately, it was done. 2 Q. So are you saying that EPA and other 3 regulatory agencies don't have the capacity to review 4 and interpret scientific information? 5 MR. NARESH: Scope -- 6 THE WITNESS: No, I'm not saying that. 7 MR. NARESH: Scope, foundation. 8 Go ahead. 9 THE WITNESS: Yeah. No, I'm not saying 10 that, of course. Absolutely not. I'm just saying 11 that we wanted to have, ourselves, a study which gave 12 a clear answer to a clear question. 13 BY MR. DICKENS: 14 Q. In a way that wouldn't have to be reported 15 to regulatory agencies? 16 MR. NARESH: Asked and answered multiple 17 times. 18 THE WITNESS: And I've said, indeed, we 19 were aware that it may have to be referred, depending 20 on the outcome, even of that simple answer to a simple 21 question. 22 (Exhibit 76 marked for identification.) 23 MR. DICKENS: Exhibit 76. This is 24 topic 28. 25 ///	522 1 MR. NARESH: -- in reviewing documents. 2 For any document that you don't have a specific 3 recollection of -- 4 THE WITNESS: Mmm. 5 MR. NARESH: -- take your time, review it 6 so that you can answer questions. 7 THE WITNESS: Yeah, well, thanks for that 8 advice, because this wasn't one that I immediately 9 remembered. That's why I was asking the question, 10 thank you. 11 BY MR. DICKENS: 12 Q. Let me know when you're ready. 13 A. Yeah, I just wanted to have a look as 14 a consequence, thank you. 15 Q. Yeah. 16 A. Yes, okay, go ahead. 17 Q. It's the email beginning on the bottom of 18 page 1 into page 2. Notice that: 19 "... ICAMA started a 'risky AI 20 re-evaluation' program' about 2-3 years ago." 21 Right? 22 A. Yes. 23 Q. And that's someone from Syngenta referring 24 to it as "risky AI re-evaluation," right? 25 A. Indeed, this is James Duan, who was the

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523 1 product manager for paraquat. 2 Q. Okay. And under that program, certain 3 risky active ingredients were selected and certain 4 studies were carried out, right? 5 A. That's right. That's what it says. 6 Q. And the regulatory agency in China does 7 undertake its own toxicity studies from time to time, 8 right? 9 A. It does. 10 Q. And it actually undertook some studies on 11 paraquat, right? 12 A. So it would seem, yes. 13 Q. And those included dermal and inhalation 14 toxicity studies, right? 15 A. That seems to be what is being suggested 16 here, yes. 17 Q. And these dermal and inhalation toxicity 18 studies, these would have actually been undertaken by 19 the regulatory agency in China itself, right? 20 A. Right. 21 Q. And those toxicity studies "will most 22 likely reclassify paraquat as highly toxic pesticide." 23 A. Right. So this was -- as I understand it, 24 this was an intention that those tests would be done. 25 Q. Now, as far as you know, the regulatory	525 1 Right? 2 A. Yes, that's what it says. 3 Q. And we looked at that term "influencing" 4 in the past with respect to regulatory agencies, 5 right? 6 A. Yes, and I don't know what it -- as I say, 7 I'm still kind of re-thinking this email through. 8 I mean, I don't know what it meant by "decision" here, 9 whether it's decision to do the testing or whether 10 it's to influence the interpretation of studies once 11 they were completed. That's still not very clear to 12 me. 13 Q. We weren't able to influence the 14 regulatory agency with respect to the program or, 15 ultimately, its conclusions from the program? 16 A. That's highly likely to be the case, yes. 17 Q. It says: 18 "It is very unusual for authorities to 19 conduct standard toxicity studies themselves or to 20 sponsor the conduct of those studies." 21 Right? 22 A. It's unusual but not unknown. 23 Q. So it does happen from time to time? 24 A. It does. 25 Q. And in this case, China ultimately elected
524 1 agency in the United States has not conducted its own 2 dermal or inhalation toxicity studies on paraquat, 3 right? 4 A. Not in this kind of -- no, no, the 5 agencies themselves have not done it. No, absolutely 6 not. 7 Q. In this case, there are some comments 8 listed there and it says: 9 "The ICAMA 'risky AI re-evaluation 10 program' comes as a surprise. The fact that it has 11 been running for 2-3 years without our [...] knowledge 12 is alarming." 13 Right? 14 A. Mmm-hmm, yes. 15 Q. So Syngenta had no idea that this was 16 ongoing by the regulatory agency in China, right? 17 A. That's right. 18 Q. And: 19 "... 'unilateral, stealth nature' of the 20 program is rather concerning..." 21 Concerning to Syngenta, right? 22 A. Mmm-hmm, yes. 23 Q. Because: 24 "... it eliminates any opportunity for 25 Syngenta to influence its decision before it is made."	526 1 to do so on certain pesticides it deemed the more 2 risky ones, right? 3 A. Yes. 4 Q. All right. And then the email on the 5 bottom of this page that goes on to the next states: 6 "... paraquat will [be] reclassified due 7 to trial result shown its dermal and inhalation 8 toxicity is higher than it was [...] in [the] current 9 dossier." 10 Right? 11 A. Well, the English, if I may say it, here 12 is a little bit tricky. Where it says "but paraquat 13 will reclassified due to trial result shown its dermal 14 and inhalation toxicity is higher..." 15 I mean, that's a bit of an ambiguous 16 statement as written. 17 Q. Yeah, and probably unnecessary: It's 18 pretty much the same statement that we looked at on 19 the email before that says: 20 "Paraquat will most likely reclassify..." 21 Or: 22 "Paraquat will most likely be reclassified 23 as 'highly toxic pesticide.'" 24 Right? 25 A. I assume that that was meant by it -- if

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527 1 this -- if these studies were to be done, that could 2 be a consequence. 3 MR. DICKENS: Okay. I'll hand you 77. 4 (Exhibit 77 marked for identification.) 5 MR. DICKENS: This is an email from August 6 5, 2015. Once again, this is topic 28 within the 7 Notice of Deposition. 8 BY MR. DICKENS: 9 Q. It's relating to "National Pesticide 10 Registration Review Committee," right? 11 A. It is. 12 Q. Okay. It includes meeting minutes and its 13 English translation, right? 14 A. Yes. 15 Q. According to the minutes: 16 "... paraquat will be reclassified as 17 'highly toxic pesticide' based on the results of acute 18 oral, dermal and inhalation toxicity studies 19 (conducted by ICAMA or under ICAMA's directions, not 20 mentioned in the text)." 21 Right? 22 A. Yes, that's correct. 23 Q. It goes on, that although: 24 "... the debate of the alternative 25 paraquat formulations registration was not conclusive,	529 1 please feel free. 2 THE WITNESS: Yeah, I'm still checking 3 this out, thank you. 4 Yes, okay. Good to go. 5 BY MR. DICKENS: 6 Q. The email on the back, which is the first 7 email in this chain, is dated July 29, 2015, right? 8 A. That's right. 9 Q. And additional information was received by 10 Syngenta from the Chinese regulatory agency, right? 11 A. Yes. 12 Q. And it turns out they actually asked a 13 CN CRO. 14 Do you know what that refers to? 15 A. A Chinese contract research lab, so a 16 tox lab in China. 17 Q. Okay. So an outside tox lab conducted 18 "acute tox studies on dermal and inhalation using PDC 19 for 2-3 years." 20 Right? 21 A. Yes. 22 Q. And "PDC" is referring to the paraquat 23 compound that was on the market in China? 24 A. PDC is paraquat dichloride, yes. 25 Q. Okay. So that is just straight paraquat?
528 1 the majority of committee members were in favor of 2 withdrawing the existing registrations." 3 Right? 4 A. Yes. 5 Q. And, therefore, those within Syngenta were 6 going to look into what the implications of being 7 deemed a "highly toxic pesticide" classification 8 ultimately were, right? 9 A. That's correct. 10 Q. And so China had, from their own studies 11 of oral, dermal and inhalation on paraquat, enough to 12 withdraw the existing registrations and deem this 13 a highly toxic pesticide? 14 A. That's what that says. 15 MR. NARESH: Form, foundation. 16 THE WITNESS: Incidentally, I don't think 17 I've ever seen those studies. 18 MR. DICKENS: Okay. Let's look at why. 19 (Exhibit 78 marked for identification.) 20 MR. DICKENS: I'll hand you Exhibit 78. 21 BY MR. DICKENS: 22 Q. I'm going to start at the very back, which 23 is the first email. 24 MR. NARESH: Dr. Botham, if you need 25 a minute to refamiliarize yourself with the document,	530 1 A. Yes. 2 Q. And so this outside organization undertook 3 tox studies which showed extreme toxicity on both 4 acute dermal and inhalation, right? 5 A. Yes. 6 Q. And those studies were apparently accepted 7 by the regulatory agency as valid, correct? 8 A. They were. 9 Q. And they were -- we know that because the 10 regulatory agency is going to change the 11 classification of paraquat from moderate toxicity to 12 extreme toxicity? 13 A. That's the email we were previously 14 looking at, the recommendation of the Pesticide 15 Registration Review Committee. 16 Q. Okay. Then Andy Cook -- and you're 17 familiar with Andy Cook, right? 18 A. Yes, I am. Yes. 19 Q. We've discussed him in the past. 20 A. Mmm-hmm. 21 Q. He writes an email. In the second 22 paragraph: 23 "It is interesting to see that ICAMA 24 apparently commissioned their own studies on the 25 dermal inhalation toxicity of paraquat."

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531 1 Right? 2 A. Yes. 3 Q. It states: 4 "However, the source of the test substance 5 is unlikely to have had a major impact on the test 6 result." 7 Right? 8 A. Right. 9 Q. Okay. So regardless of where the paraquat 10 chloride came from, that probably didn't affect the 11 results? 12 A. Yeah, so the test design is much more 13 significant, yes. 14 Q. Okay. And so he asks, and bolded: 15 "Is it possible to have access to the 16 study results and/or the study reports themselves? Do 17 we know which CRO conducted the studies?" 18 Right? 19 A. Yeah. And going back to what I was just 20 saying, yes. 21 Q. It's a reasonable request? 22 A. Mmm. 23 Q. That's a yes, right? 24 A. Yes, yes. 25 Q. And that's -- certainly, Syngenta would be	533 1 from ICAMA until further notice." 2 Right? 3 A. He does say that, yes. 4 Q. Now, part of the reason -- well, first of 5 all, you indicated you have never seen the test 6 results, right? 7 A. I don't think I've ever seen those 8 studies. 9 Q. And, as far as you know, those studies 10 have never been requested by Syngenta, right? 11 A. Well, that would be one reason why I'd 12 never seen them. 13 Q. If Syngenta had received them, you would 14 likely have seen them, right? 15 A. Most likely, yes. 16 Q. So as far as you know, they've never been 17 received? 18 A. That would be my estimate, yes. 19 Q. And do you know whether or not they've 20 ever been requested? 21 A. I don't know. I've not -- I have never 22 received any information with that -- to that 23 question. 24 Q. And, certainly, had Syngenta received 25 toxicity studies conducted by the Chinese regulatory
532 1 interested in receiving study results or study reports 2 that show paraquat having extreme dermal or inhalation 3 toxicity, right? 4 A. Yes, and that's -- Andy Cook is reflecting 5 that request or inquiry. 6 Q. Okay. 7 The email right before that starts on the 8 first page and goes to the second. It's from a 9 James Duan. 10 Do you see that? 11 A. I do. 12 Q. Do you know who that is? 13 A. Yeah. I think, as I said before, James 14 was the product manager for -- the commercial product 15 manager for paraquat at that time. 16 Q. For all of Syngenta? 17 A. For paraquat. 18 Q. Okay. But he's with Syngenta, commercial 19 manager -- 20 A. Yeah. 21 Q. -- for paraquat, right? 22 A. Yes. Yes. 23 Q. And he instructs those on the email chain: 24 "... please," in bolded letters and 25 capitalized, "DO NOT approach and ask for test results	534 1 agency showing extreme toxicity on acute dermal and 2 inhalation, that would have potentially generated a 3 PRF, right? 4 A. It's new information. I mean -- but the 5 reason why you'd need to see a study report is that 6 the devil is in the detail; you'd need to know exactly 7 what do they mean by "extreme toxicity." We don't 8 even know that. 9 Q. And so as new information showing extreme 10 toxicity, that potentially could have led to a PRF in 11 which the US EPA would have had to have been notified 12 of those results, right? 13 A. If that information was not otherwise in 14 the public domain. 15 Q. Did China ban the use of paraquat or did 16 Syngenta choose not to seek a registration? 17 A. I believe China -- well, this is where we 18 go back to the list of countries, so... 19 It says here, countries that disallowed 20 paraquat sales because of concerns about acute 21 toxicity, and that includes China. 22 Q. And you have no idea, as you sit here 23 today, whether or not those toxicity concerns involved 24 neurotoxicity in any way, right? 25 A. I think that it was to do, as it suggests

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535 1 here -- much more to do with acute toxicity, including 2 things like suicide. 3 Q. You've never seen those studies, right? 4 MR. NARESH: Objection; asked and 5 answered. 6 THE WITNESS: The acute studies, I don't 7 believe I've ever seen. 8 MR. DICKENS: We can put that aside. 9 Why don't we take a break. 10 THE VIDEOGRAPHER: We are going off the 11 record at 14:14. 12 (Break taken.) 13 THE VIDEOGRAPHER: We are back on the 14 record at 14:27. 15 BY MR. DICKENS: 16 Q. Dr. Botham, throughout the course of the 17 deposition, we've discussed the research on paraquat 18 and Parkinson's disease representing a threat to 19 the company, right? 20 A. It's posing a potential threat if it were 21 ever proven that there were a causative link. 22 Q. And that would potentially affect the 23 freedom to sell, correct? 24 A. It would -- the freedom to sell is 25 actually, as I was describing earlier, the judgment on	537 1 Q. Okay. And on the very last email which 2 goes on to the second page, Syngenta had retained her 3 to undertake a review concerning Parkinson's disease, 4 right? 5 A. Yes. 6 Q. Okay. And that was a review in -- which 7 she completed and sent to Syngenta, right? 8 A. Yes, that's right. 9 Q. And Nick Sturgess -- and, once again, he's 10 the neurotoxicologist, right? 11 A. Nick, yes, that's right. 12 Q. And he gave some comments after reading 13 the Pedersen report, right? 14 A. He did. 15 Q. He says: 16 "... they don't really give us much scope 17 to dismiss the claimed pesticide links on the basis of 18 fundamental flaws in the study design or analysis." 19 And that's what Syngenta was hoping for, 20 right, is that her report would give them evidence or 21 some support to dismiss that there was any link 22 between pesticides and Parkinson's disease? 23 A. I'd position it somewhat differently. 24 I think that this is actually a great example of where 25 we were reaching out to people knowing that they
536 1 the safety; is it safe -- is it the right thing for us 2 to be doing. 3 So the implication, actually, is our 4 license to sell, our ability to do that, to get 5 permission to do that through regulatory authorities. 6 Q. And, from time to time, Syngenta would 7 consult with outside researchers and scientists with 8 respect to the data and information related to 9 paraquat and Parkinson's disease? 10 A. Yes. Nearly all the time we would be 11 doing that. 12 MR. DICKENS: I'll hand you Exhibit 79. 13 (Exhibit 79 marked for identification.) 14 MR. DICKENS: This is topic 49. 15 BY MR. DICKENS: 16 Q. This is an email from back in 2002 with 17 respect to epidemiology review for Syngenta, right? 18 A. That's the title of the email, yes. 19 Q. Okay. And Syngenta, at this time, 20 consulted with a Nancy Pedersen. 21 Do you see that? 22 A. Yes, I do. 23 Q. Do you know who Nancy Pedersen is? 24 A. I believe that she was a scientist 25 epidemiologist from Sweden.	538 1 would not necessarily be giving the answer that we 2 wanted. So, you know, this was meant to be an 3 objective, outside view on the state of the science at 4 that time, specifically here on the epidemiology. 5 Q. So you specifically reached out to -- do 6 you know if Nancy Pedersen is an epidemiologist? 7 A. You know, I don't, sitting here, know 8 exactly what her qualification is, but I think she 9 certainly has some epidemiological expertise. 10 Q. Okay. And Syngenta reached out and said, 11 "Help us evaluate this information so we can determine 12 what to do with it," right? 13 A. Yeah. And this is 2002, so there were 14 certainly a number of epidemiology studies that had 15 been published by them. 16 Q. Have you asked Dr. -- or, sorry, 17 Professor Pedersen to undertake a re-evaluation of the 18 epidemiology in any way, to your knowledge? 19 A. No. 20 Q. And you said, "Okay, you review the 21 information so we can get your input," right? 22 A. Yes. 23 Q. And, obviously, if you asked her to do so, 24 you would have considered Nancy Pedersen to be an 25 expert in the field?

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539 1 A. Yes. 2 Q. And she gave you her review? 3 A. She did. 4 Q. And she gave some comments on the Liou 5 study, right? 6 A. She did. 7 Q. And you're familiar with that study? 8 A. I am. 9 Q. And that study concluded there was a 10 positive association between paraquat and Parkinson's 11 disease, right? 12 A. Yes. 13 Q. And Professor Pedersen found that it was 14 not flawed and the authors' conclusions were 15 reasonable, right? 16 A. That was her view, yes. 17 Q. So overall, based on her entire report, 18 she found there was: 19 "... good epidemiological evidence for 20 environmental factors (such as pesticides) playing a 21 significant role in the etiology of paraquat, and that 22 exposure to..." 23 Or: 24 "... Parkinson's disease, and exposure to 25 paraquat may be one component of this."	541 1 were on our own workforce. We talked about that, 2 I think, briefly yesterday; so the studies that 3 appeared under the Tomenson and Campbell authorship. 4 We also asked an external expert to look 5 at the survivors of paraquat poisoning and whether 6 they had developed any Parkinsonism signs. 7 Q. Okay. So those were the two studies 8 undertaken by Syngenta -- 9 A. Yeah. 10 Q. -- right? 11 A. And the first one was two -- essentially, 12 two publications because we looked initially at that 13 population, then again in ten years following; so it 14 was a two-part study. 15 Q. Okay. Did Syngenta, at any point, inform 16 its customers or farmers as to Professor Pederson's 17 opinions or the information she provided to you in her 18 report? 19 A. I don't know that we mentioned Professor 20 Pederson, but we certainly, in the time period that 21 we're now moving into, not necessarily 2002 but not 22 that long after, we did start to put into the public 23 domain, through our website, the emerging information, 24 if you like, on the possible link between paraquat 25 exposure and Parkinson's.
540 1 Right? 2 A. Yeah. 3 MR. NARESH: Object on completeness. 4 THE WITNESS: So, yes, she wasn't saying, 5 "Look, my review of this literature says paraquat is 6 clearly causative in Parkinson's disease." That's not 7 -- wasn't her conclusion, but that she felt that there 8 was evidence that was suggestive of some form of link. 9 BY MR. DICKENS: 10 Q. Okay. And at this time -- well, you'd 11 agree that not one single epidemiological study could 12 be conclusive as to whether or not something caused 13 Parkinson's? 14 A. Indeed, that's very rarely the case. 15 Q. Okay. And so she says, you know, it's 16 suggestive, more research needs to be done, 17 essentially, right? 18 A. Yeah, yeah. Yes. 19 Q. Okay. And did Syngenta go do any 20 epidemiological studies -- 21 A. It did. 22 Q. -- in any way following this? 23 A. Yes, it did. 24 Q. Okay. And when was that? 25 A. So the studies that we specifically did	542 1 Q. Okay. And that's paraquat.com? 2 A. That's paraquat.com. 3 Q. And so is it your testimony that 4 paraquat.com contained a statement that said there's 5 good epidemiological evidence for environmental 6 factors such as pesticides playing a significant role 7 in the etiology of Parkinson's disease and exposure to 8 paraquat might be a component to this? 9 MR. NARESH: Objection; form. 10 THE WITNESS: Yeah, I mean, I'd need to go 11 back and read the detail, but what we were putting 12 into paraquat.com were some of the key studies, and 13 not just back in 2002, you know, certainly beyond 14 that. 15 But, again, it was put in terms of the 16 weight of evidence. So we were also talking about the 17 animal studies and what we believed that weight of 18 evidence was telling us and, hence, communicating that 19 to those who wished to know. 20 BY MR. DICKENS: 21 Q. And that was in the context of there is 22 no link between paraquat and Parkinson's disease? 23 A. The conclusion was, and still is, that 24 that weight of evidence says there's no evidence -- 25 insufficient evidence, no evidence, whichever phrase

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543 1 you'd prefer, for a causative link. 2 Q. Did, to your knowledge, Syngenta ever 3 inform the United States Environmental Protection 4 Agency of the existence of Professor Pedersen's 5 report? 6 A. I don't know whether that was made 7 available. 8 MR. NARESH: Scope. Scope and foundation. 9 BY MR. DICKENS: 10 Q. Dr. Botham, you're familiar with the 11 product Gramoxone Inteon; is that right? 12 A. I am. 13 Q. And Gramoxone Inteon was put on the market 14 in the United States? 15 MR. NARESH: Is this 71? 16 MR. DICKENS: It is. 17 MR. NARESH: As you know, we have a 18 pending objection on 71. Dr. Botham is free to answer 19 any questions in his personal capacity on this, but we 20 would object to corporate representative testimony, as 21 we have articulated for the last several months. 22 MR. DICKENS: Okay. Well, I'm not aware 23 of any protective order or anything preventing -- are 24 you putting up another witness to speak on these 25 issues?	545 1 MR. DICKENS: You can have an objection. 2 MR. NARESH: Can I have a standing 3 objection? 4 MR. DICKENS: That's correct. 5 THE WITNESS: I'm pretty sure, by the way, 6 that I have not read this as part of my preparation. 7 BY MR. DICKENS: 8 Q. Okay. And this document, though, is 9 December 7, 2012. Monty Dixon is included on the 10 cover, right? 11 A. He is. 12 Q. Okay. Now, what was Gramoxone Inteon? 13 A. Gramoxone Inteon was a formulation of 14 paraquat which contained another, what we called a 15 safening agent in the form of alginate. Alginate is 16 something that's found in, for example, indigestion 17 medicine. 18 It is -- it comes from seaweed. It was 19 added because there was a hypothesis that in having 20 alginate, it would reduce the possibility of paraquat 21 being absorbed from the stomach and causing its acute 22 toxicity. 23 Q. And Syngenta had respected that Gramoxone 24 Inteon with that alginate formula was a safer version 25 of paraquat formulation, right?
544 1 MR. NARESH: We are not. We object to the 2 topic. We have made that clear for over -- for three 3 months now and you have not taken any action to 4 progress that either. He's here, he can answer any 5 questions that he knows in his personal capacity, but 6 he's not here as a corporate representative on 71. 7 MR. DICKENS: We can address that with 8 the Court later. 9 BY MR. DICKENS: 10 Q. Doctor, do you agree that Gramoxone Inteon 11 was the only product on the market for a specific time 12 in the United States? 13 MR. NARESH: Objection; form, foundation, 14 scope. 15 THE WITNESS: I don't know whether it was 16 the only product. 17 MR. DICKENS: Go ahead and mark Exhibit 80 18 for the record. 19 (Exhibit 80 marked for identification.) 20 BY MR. DICKENS: 21 Q. Doctor, I've handed you a PowerPoint, 22 "Paraquat US Regulatory," dated December 7, 2012. 23 Do you see that? 24 MR. NARESH: Can I have a standing 25 objection on scope and foundation?	546 1 A. On the basis of the -- some of what you 2 might call preclinical toxicology studies that had 3 been done, yes. 4 Q. Well, it was represented as safer to both 5 regulatory agencies as well as end users and farmers, 6 right? 7 A. It was, yes. 8 Q. It was represented as having less dermal 9 exposure or dermal absorption than the prior paraquat 10 formulations on the market? 11 A. I believe that was also the case, yes. 12 Q. Okay. Created less risk of acute toxicity 13 as well? 14 A. That was the aim, yes, and mainly 15 particularly to avoid accidental poisoning. 16 Q. And you're aware Inteon -- a registration 17 for the application of Inteon was submitted to the 18 United States? 19 A. Yes, I know that, certainly. 20 Q. And you know it was approved in the United 21 States, right? 22 A. I believe it was, yes. 23 Q. And it was approved on the basis and 24 representations that it was a safer formulation, 25 correct?

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547 1 MR. NARESH: Objection; form. 2 THE WITNESS: That was clearly one of the 3 positive attributes of the formulation, yes. 4 BY MR. DICKENS: 5 Q. And you're aware that Syngenta undertook 6 efforts to get other companies' paraquat-containing 7 formulations removed from the market, right? 8 A. Well, you're now again into questions of 9 detailed regulatory strategy, which I wouldn't be able 10 to accurately answer. 11 Q. No one -- you weren't informed of that 12 before today? 13 A. I mean, I may have been but I can't recall 14 exactly if and how I was informed. 15 Q. And you don't know whether or not 16 the company moved to withdraw all other registrations 17 other than Gramoxone Inteon, right? 18 A. Again, that's the level of detail I said 19 I wasn't -- I didn't have at my fingertips. 20 Q. Okay. 21 If we can turn to page 2 of this document, 22 it shows that the Inteon application was submitted to 23 the United States in September 2004 with some oral tox 24 dog studies, right? 25 A. Yes, we -- so the basis of those	549 1 A. That's what it says. 2 Q. Do you know what Gramoxone Max is? 3 A. Well, that was the formulation we were 4 talking about earlier, so it would certainly be one of 5 the formulations that was commercialized in the United 6 States. 7 Q. Next page of the timeline, October 2006, 8 the EPA places a two year conditional registration of 9 generic paraquat requiring an increased level of 10 emetic, right? 11 A. Yes. 12 Q. That expires in 2008 unless the registrant 13 proves the product would not increase the risk of 14 adverse effects, correct? 15 A. Okay, yes. 16 Q. And then in November 2006, the EPA issues 17 a cancellation order for Gramoxone Max? 18 A. Okay. 19 Q. What does it mean when the EPA issues a 20 cancellation order, to your knowledge? 21 A. This is language which is not language 22 that I -- was in my day-to-day work. I don't know 23 whether that means that they canceled the registration 24 of Gramoxone Max or whether they're canceling the idea 25 that it should be. So, I'm sorry, this is not clear
548 1 preclinical studies that I was talking about is that 2 they were done in the dog because the dog is a 3 vomiting species and so is the closest we could get to 4 an animal model that may be -- reflect a human -- the 5 way in which a human could be -- could suffer toxicity 6 from paraquat. 7 Q. Okay. And did Gramoxone Inteon include an 8 emetic? 9 A. Yes. There was -- as was the case with 10 other formulations, there was an emetic and, indeed, 11 certainly at some point there was an increased level 12 of emetic. 13 Q. Increased at the time of Inteon, before or 14 after that? 15 A. Well, again, the detailed timing, I can't 16 comment on, but I do know that the level of emetic in 17 some formulations, including Inteon, I think went up 18 by three-fold or two- -- it was certainly increased. 19 Q. The next page in this timeline, August 20 2005, Gramoxone Inteon registration was approved, 21 right? 22 A. Yes. 23 Q. And then September 2005, Syngenta requests 24 voluntary cancelation of Gramoxone Max. 25 Right?	550 1 to me. 2 Q. You have no idea? 3 A. No, I mean, I wouldn't be able to give you 4 an accurate interpretation of what that meant. 5 MR. DICKENS: I'll hand you what we'll 6 mark 81. 7 (Exhibit 81 marked for identification.) 8 MR. DICKENS: This remains topic 71. 9 MR. NARESH: Same standing objection as to 10 this document? 11 MR. DICKENS: Same standing objection. 12 THE WITNESS: I mean, let me also raise an 13 objection because, quite frankly, you know, you're now 14 showing me documents that I certainly haven't read as 15 part of the preparation for this meeting. 16 BY MR. DICKENS: 17 Q. Okay. And did you pull the documents 18 yourself for preparation in this -- 19 A. No, no, I was provided them. 20 Q. Okay. Now, this document is "Gramoxone 21 'AWT key message toolkit," right? 22 A. Yes. 23 Q. And what does AWT refer to? 24 A. Well, it's -- 25 Q. Is that the alginate?

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551 1 A. It's alginate wetter -- I can't remember. 2 Yes. 3 Q. Okay. 4 A. You're now illustrating my point. I've 5 not been able to prepare on this. 6 Q. The toolkit includes key messages for 7 regulators, medical community, NGOs, growers, 8 internal, right? 9 A. Yeah. 10 Q. If you can turn to 7094. 11 Again, small writing. 12 A. Yeah. 13 Q. Under benefit -- well, first of all, the 14 stakeholder here are "Growers." 15 Do you see that? 16 A. I'm still navigating my way around this. 17 Q. At the very top left-hand corner. 18 A. Oh, yes, okay, right. 19 Q. Okay. And "growers," that would be the 20 farmers and other end users? 21 A. Yes, I assume so. 22 Q. "The bottom-line message" is: 23 "Gramoxone AWT is a breakthrough." 24 Right? 25 A. That's what it says.	553 1 A. On the basis of those dog studies, yes. 2 Q. Okay. And easy to use safely, right? 3 A. Yes. 4 Q. And, in fact, in the bottom left-hand 5 corner, "What you must not say" and that -- it won't 6 have an impact on safety, right? 7 A. Okay. 8 Q. So Syngenta would tell the growers and 9 other users this is more safe, based once again on 10 those dog studies that they had at the time, correct? 11 A. That was true at the time. 12 Q. Okay. 13 And you know, as being in the safety 14 wheelhouse, that that same message of this being safer 15 was also represented to regulatory agencies? 16 A. It was, yes. 17 Q. To the United States as well? 18 A. Yes. 19 Q. Are you aware that Gramoxone Inteon was 20 represented as lowering plasma paraquat levels 21 compared to the previous paraquat formulations across 22 a 16-fold increase in dose? 23 A. Yes, I was very familiar with those 24 studies. 25 Q. And reduced skin irritancy compared to the
552 1 Q. And benefits to stakeholders includes it 2 improves activities on key weeds, and improved 3 efficacy. 4 You're aware that that is a message for 5 Gramoxone Inteon during the time that it was marketed, 6 right? 7 A. Well, this is what that says. 8 Q. Okay. Did you know that independently of 9 seeing this document? 10 A. I know that there were discussions about 11 the relative efficacy of the alginate-containing 12 formulation versus the previously marketed ones. 13 I mean, it was a detail which, again, was not in my 14 wheelhouse, if you wish, so -- but, clearly, this 15 suggests that there would have been some efficacy 16 benefit. 17 Q. It also says there's a breakthrough in 18 safety, correct? 19 A. Which is -- was in my wheelhouse, 20 absolutely, as I was describing, yes. 21 Q. Okay. So the safety aspects of Inteon's 22 within your wheelhouse? 23 A. Yes. 24 Q. Okay. So you know that it was marketed as 25 less toxic, right?	554 1 Gramoxone formulations on the market? 2 A. Yes, I was aware of that, too. 3 Q. All things that were represented to the 4 regulatory agencies, right? 5 A. I believe that they were all included in 6 what were submitted to the agencies, yes. 7 Q. Now, Gramoxone Inteon is no longer on the 8 market in the United States, correct? 9 A. Correct. 10 Q. Syngenta made a determination or decision 11 to replace Gramoxone Inteon, right? 12 A. They did. 13 Q. And were you involved in those decisions 14 to remove Gramoxone Inteon from the market? 15 A. No, I wasn't involved in the decisions. 16 I was certainly part of the provision of information 17 that would have led to that. 18 Q. Do you know when Gramoxone Inteon was 19 removed from the market in the United States? 20 A. No, I don't have that date to hand, 21 I'm sorry. 22 MR. DICKENS: I'll go ahead and hand you 23 Exhibit 82. 24 (Exhibit 82 marked for identification.) 25 MR. DICKENS: You can have a standing

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555 1 objection to this document. 2 MR. NARESH: Thank you. 3 BY MR. DICKENS: 4 Q. Exhibit 72 -- 5 THE STENOGRAPHER: 82. 6 BY MR. DICKENS: 7 Q. -- 82 begins with an email from a Jonathan 8 Sullivan on March 11, 2008, for "Paraquat Issue 9 Leadership Team Meeting on March 13, 2008," right? 10 A. Indeed. 11 Q. And subjects "need to address" is listed 12 as Inteon, right? 13 A. Yes. 14 Q. The third bullet point: 15 "Commercial options to replace Inteon with 16 low concentrate and/or high emetic Gramoxone." 17 Correct? 18 A. Correct. 19 Q. So there were discussions going on within 20 Syngenta of replacing Inteon with another product 21 either at a lower concentration or with a higher 22 emetic, right? 23 A. There were. 24 Q. And you were aware there were 25 conversations going on while you were working for	557 1 equivalent to that of Inteon product." 2 Right? 3 A. That's what it says. 4 Q. So if we're going to go ahead and replace 5 Inteon, we need to show that what we are putting on 6 the market is just as safe, right? 7 A. Indeed, and that's what we actually did 8 proceed to do. 9 MR. DICKENS: I'll go ahead and hand you 10 Exhibit 73. 11 THE STENOGRAPHER: 83. 12 MR. DICKENS: 83. I want to go back. 13 (Exhibit 83 marked for identification.) 14 BY MR. DICKENS: 15 Q. I've handed you a document, according to 16 the production, by Syngenta. It is April 10, 2010, 17 "Proposal to move to a non-Inteon paraquat formulation 18 in the USA." 19 Do you see that? 20 A. I do. And can I just continue to state -- 21 Q. Yes. 22 A. -- that these are documents that I have 23 not been prepared for ahead of this discussion today. 24 But the general theme, I am aware of. 25 Q. Okay. And the general theme, including an
556 1 Syngenta? 2 A. Indeed, yes. 3 Q. And who was Jonathan Sullivan? 4 A. He was a general counsel based in Basel. 5 Q. It says: 6 "I would ask you to limit any paper or 7 slide materials which you produce for the meeting to 8 the practicable minimum and send me in draft form for 9 review any materials which you propose to use." 10 Correct? 11 A. Yes. 12 Q. That's what he says? 13 A. That's what he said, yes. 14 Q. He mentions a note of a "third bullet 15 point item," right? 16 A. Yes. 17 Q. And turning -- Syngenta says: 18 "... I would make you aware that by 19 switching to a non-Inteon formulation in those 20 countries where Inteon has been sold (and conceivably 21 those countries where Inteon registrations and 22 requests for safety standards are pending) we increase 23 our exposure in any future litigation relating to 24 ingestion unless we are able to show that the safening 25 effect of the replacement formulation in at least the	558 1 objective in moving to a non-Inteon formulation to 2 maintain the current business and grow in the 3 glyphosate-resistant burn down market while 4 differentiating paraquat from its generic competitors. 5 Right? That was a consideration? 6 A. To try to maintain the degree of improved 7 safety that we thought Inteon was providing. 8 Q. And the company did undertake a analysis 9 as to how moving to a non-Inteon formulation would 10 affect business, right? 11 A. It did, yes, mmm-hmm. 12 Q. And by moving to a non-Inteon formulation, 13 there would be an increase in net sales and volume, 14 right, from 58 million to 75 million? 15 A. Yeah. Well, again, this is -- I mean, 16 I don't think I ever did see that kind of information 17 before, but it's what it says here. 18 Q. So you weren't aware that a "do nothing" 19 and keep Inteon on the market, there would be a 20 forecast of loss of sales from 58 million to 21 35 million? 22 A. No. I mean, all I know is that there were 23 a number of issues with Inteon, including the fact 24 that, actually, it wasn't as stable in the field as we 25 thought it would be and there were also questions

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559 1 about whether -- how much safer it really was. 2 Q. Okay. So how much safer it really was 3 than the formulation it replaced, right? 4 A. Yeah. I mean, I don't know where you want 5 to go with this, but, I mean, the whole question about 6 the improved safety of Inteon was originally built on 7 dog studies, but then, also, we were looking at 8 information in other parts of the world, like 9 Sri Lanka, on whether, in practice, we were seeing a 10 reduced safety -- an improved safety of paraquat 11 Inteon. 12 Q. So despite the representations to the 13 regulatory agency that this would be a safer product, 14 Syngenta determined, ultimately, that it was not, 15 right? 16 MR. NARESH: Form. 17 THE WITNESS: And this, again, I think is 18 -- should be seen in a very positive light. I mean, 19 this was doing post-marketing surveillance, almost, if 20 you like, in Sri Lanka and other countries. We 21 were not entirely relying on those dog studies saying 22 this is definitely a safer product. 23 BY MR. DICKENS: 24 Q. And what aspect of the safety did you 25 ultimately determine was not actually safer than the	561 1 in the field. 2 And certainly in some places, and I don't 3 know whether it was actually also in the US -- again, 4 a bit outside of my wheelhouse -- the Inteon 5 formulation was giving a few technical problems. 6 Q. Okay. And what technical problems was it 7 causing? 8 A. Again, outside of my wheelhouse, but 9 I think it included the stability of the formulation, 10 whether it was blocking nozzles, that kind of thing. 11 Q. Okay. So Inteon, the decision ultimately 12 to remove Inteon from the market was on the basis that 13 while it was a little safer, that increased safety was 14 modest as well as performance issues? 15 A. That's right. 16 Q. So the combination of the two led Syngenta 17 to decide we're going to replace Inteon, right? 18 A. That's right. 19 Q. Okay. And there was an understanding at 20 the time that, by doing so, there would also be an 21 increase in sales, right? 22 A. Right. 23 MR. DICKENS: I'll hand you Exhibit 84. 24 (Exhibit 84 marked for identification.) 25 MR. NARESH: And just -- did you make
560 1 product it replaced? 2 A. The degree of improved safety, which was 3 -- when we first started doing those, those dog 4 studies, there were proposals that the data were 5 telling us it could be five times, or even greater, 6 less toxic, acutely toxic than the original 7 formulation. 8 The post-marketing surveillance, the work 9 that was done in, for example, Sri Lanka said that was 10 certainly an overestimate, maybe, at best, two-fold. 11 Q. Okay. So Inteon was safer than the 12 product it replaced; it just wasn't as safe as 13 represented? 14 A. And even whether that it was definitely 15 more safe was in doubt. That post-marketing 16 surveillance data, as would be true of any human data, 17 it's always more difficult to interpret, but, 18 certainly, it was not providing anywhere near the 19 degree of additional safety that we hoped it would do. 20 Q. Okay. It did provide some additional 21 safety? 22 A. It was very modest. 23 Q. But it did provide some? 24 A. Yeah. But also, as I said, it wasn't just 25 about safety; it was about, well, how is this working	562 1 a representation earlier about Inteon being the only 2 Gramoxone product available for sale in the United 3 States for a period of time? 4 MR. DICKENS: I'm not sure it was 5 a representation -- 6 MR. NARESH: Okay. 7 MR. DICKENS: -- as much as a question. 8 MR. NARESH: Okay. 9 BY MR. DICKENS: 10 Q. Dr. Botham, I've handed you a document 11 which is an email chain from February of 2010, 12 regarding Inteon in the USA. 13 Do you see that? 14 A. Yes. 15 Q. And, once again, it's from -- the middle 16 email is from Jonathan Sullivan to a David Scott. 17 Do you see that? 18 A. I do. 19 Q. And who was David Scott within Syngenta? 20 A. David Scott at that time, I think, was the 21 product manager for paraquat. 22 Q. Okay. Jonathan Sullivan had concerns 23 about the content of a slide which would be 24 discoverable, and you understand that to be 25 discoverable in litigation?

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563 1 A. I assume that was what he was referring to 2 here. 3 Q. "... if we determine to replace 'Inteon' 4 and market an alternative formulation, to mean that 5 'Inteon' was withdrawn (against the [backdrop] of 6 previous claims of superior safening) amongst other 7 things to preserve a dominant market share and contain 8 manufacturing costs." 9 Right? 10 A. Right. 11 Q. We don't want this to look like our 12 decision was based on sales, right? 13 A. Right. 14 Q. Now, you mentioned that there were issues 15 with Inteon and clogging nozzles; is that right? 16 A. Well, I believe that was the case, yes. 17 Q. And, ultimately, the company did replace 18 Inteon with another Gramoxone, right? 19 A. Yes, it did. 20 Q. And that was true in the United States? 21 A. It was. 22 Q. After doing so, that did not improve the 23 clogging of nozzles, did it? 24 A. That, I'm not so sure about. 25 MR. DICKENS: I'll hand you Exhibit 85.	565 1 2011, and is that roughly your understanding of when 2 Inteon was on the market? 3 A. That sounds about right. 4 Q. And that was 13 per million pounds of 5 paraquat sold, right? 6 A. Right. 7 Q. So less mixing complaints with Inteon than 8 its replacement, Gramoxone SL? 9 A. Right. 10 Q. So the problems that were being 11 experienced by the consumers didn't cease after Inteon 12 was removed from the market, right? 13 A. Right. 14 Q. Was Gramoxone SL withdrawn from the 15 market? 16 A. I don't know. I mean, this is, again, an 17 area -- this is outside of my expertise. 18 Q. Were you aware that there continued to be 19 mixing complaints and clogged nozzles with 20 Gramoxone SL? 21 A. I may have done. I don't -- it's not 22 something that I thought, "Yeah, I definitely knew 23 that," but -- I was more aware of the ones with 24 Inteon. 25 Q. Okay. Let's turn to page ending in 734.
564 1 (Exhibit 85 marked for identification.) 2 BY MR. DICKENS: 3 Q. Doctor, I have handed you "Gramoxone 4 2.0 SL in USA." 5 Do you see that? 6 A. Yes. 7 Q. Okay. This is dated May 25, 2012, right? 8 A. Right. And, again, I did not look at this 9 in preparation for today. 10 Q. It says: 11 "Current state: significant mixing 12 complaints, high level of customer dissatisfaction." 13 Right? 14 A. Right. 15 Q. The situation first is: 16 "70+ recorded calls year to date on 17 Gramoxone SL mixing complaints." 18 Do you understand Gramoxone SL to be the 19 product that replaced Inteon in the United States? 20 A. Yeah, that would make sense. 21 Q. Okay. And there were mixing complaints of 22 14 per million pounds of paraquat sold, right? 23 A. That's what it says, yes. 24 Q. Okay. And it notes that there were mixing 25 complaints with Gramoxone Inteon between 2007 and	566 1 There's a proposal and a recommendation to 2 pursue registration and a launch at 360 grams 3 per liter, 5x emetic replacement product. 4 Right? 5 A. Right. 6 Q. And what is the 360 grams per liter, 7 5x emetic product? Can you describe what that is 8 referring to? 9 A. Well, that would be a Gramoxone paraquat 10 formulation with a higher concentration of the active 11 ingredient of paraquat, because that was previously 12 240 grams per liter; now we're talking about 360 grams 13 per liter. And in order to try to maintain an 14 equivalent safening through the presence of an emetic, 15 to give an equivalent increase in the level of emetic. 16 Q. Okay. 17 There's an implementation plan and it says 18 "Submission of Gramoxone Max." 19 Do you see that? 20 A. Yes. 21 Q. And Gramoxone Max was the product on the 22 market in the United States prior to Inteon, right? 23 MR. NARESH: Foundation. 24 THE WITNESS: Yes, it was. 25 ///

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567 1 BY MR. DICKENS: 2 Q. Okay. And, as we can see on that previous 3 slide that we looked at, there was only a 0.2 per 4 million pounds of paraquat sold for complaints 5 regarding Gramoxone Max mixing? 6 A. That's what it says, yes. 7 Q. So Gramoxone Max, the previous version, 8 wasn't having the mixing or clogged nozzle complaints? 9 A. The data seemed to suggest that, yes. 10 Q. And so there was a consideration or 11 decision to potentially return to Gramoxone Max with 12 some modifications; is that fair? 13 A. That's fair. 14 Q. And then: 15 "Alternatively, in the absence of a clear 16 path to return to a commercially sustainable position, 17 prepare an exit strategy (likely divestiture) for the 18 USA paraquat assets." 19 Right? 20 A. Well, that was the bottom line on this 21 slide, yes. 22 Q. Okay. So if we can't get to a 23 commercially sustainable position, we can consider 24 just removing paraquat from the US market completely? 25 A. That was clearly being considered at	569 1 Right? 2 A. Indeed, yes, that's correct. 3 Q. And inconsistent with the position 4 previously taken in the registrations of the earlier 5 paraquat versions, right? 6 A. Yes. 7 MR. DICKENS: We can put those aside. 8 I'll hand you 86 for the record. This is 9 topic 69. 10 (Exhibit 86 marked for identification.) 11 BY MR. DICKENS: 12 Q. Sir, I've handed you a document. It has 13 a last updated date of January 2014, with the risk 14 title "10.2 Paraquat," and this is a document you have 15 seen before, correct? 16 A. Yes, I have seen this one. 17 Q. Okay. And you've reviewed this document 18 in preparation for the deposition? 19 A. I have, yes. We're back into my area that 20 I've reviewed. 21 Q. As well as other documents that are 22 similar to this, right? 23 A. I've seen more than one document of this 24 type. 25 Q. Okay. And do you know what this document
568 1 the time. 2 Q. Okay. 3 Now, turn to page 737 and section 4 "Reputation/Credibility," it says: 5 "There has not been an accidental death 6 from US Inteon or the newer US SL 2.0 formulations." 7 Do you see that? 8 A. Yes. 9 Q. And that was your understanding? 10 A. Yes. Indeed, yes, it was. 11 Q. And is that -- and that's limited to the 12 United States, right? 13 A. Yeah. This is very much a US perspective 14 where accidental death was, fortunately, quite low. 15 Q. Okay. Were there accidental deaths in the 16 United States from the pre-Inteon Gramoxone on the 17 market? 18 A. I'm aware that there were some unfortunate 19 accidental deaths in the US and -- yes, but they were 20 relatively, fortunately, very -- relatively 21 infrequent. 22 Q. Then it says commercializing a product 23 with increased emetic with a safety oral toxicity 24 determination is inconsistent with a regulatory 25 position.	570 1 represents? 2 A. Well, I did discuss that with colleagues 3 and this seems to be, again, a document which is used 4 quite generically with our products to try to 5 understand the risks associated with the manufacture, 6 sales, and registration of products. 7 Q. Okay. And the risk owner includes 8 James Duan and Jonathan Sullivan, both of who we had 9 talked about in the past, right? 10 A. That's right. 11 Q. And they give a description and rationale 12 of the risk and some main scenarios that are 13 identified, right? 14 A. Yes. 15 Q. And, at this point, it includes regulatory 16 bans or restrictions in key countries, correct? 17 A. Yes. 18 Q. Alleged neurotoxicity? 19 A. Yes. 20 Q. And there's a concern of alleged 21 neurotoxicity leading to additional legal liabilities, 22 right? 23 A. Yes. 24 Q. It says: 25 "Unknown resolution of Chinese

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571 1 government's request for an alternative to liquid 2 formulations." 3 Do you know what that's referring to? 4 A. Yes. There was -- I remember at the time 5 there were -- whether there was going to be a request, 6 for example, to move to a solid formulation in China. 7 Q. Okay. Was that request ever made? 8 A. There was certainly some active discussion 9 about it. I'm not quite sure of the status of the 10 formal request from China, but it was certainly 11 something that was debated internally. 12 Q. Okay. And then there's some 13 triggers/drivers of risk, right? 14 A. Yes. 15 Q. And that includes scientific publications 16 on alleged paraquat neurotoxicity? 17 A. It does. 18 Q. And regulatory bans increasing the 19 likelihood of restrictions in other locations as well 20 as notification to the Rotterdam Convention, right? 21 A. That's right. 22 Q. And that's -- sorry, the Rotterdam 23 Convention, that's also the PIC that we looked at 24 earlier? 25 A. That's right, yeah, Prior Informed	573 1 were involved in reviewing it. 2 Q. And there's "Consequences of risk" and 3 "People's health and safety," and a 4 is circled 4 there, right? 5 A. Right. Sorry, we're dotting around about 6 here. We're -- yes, okay. On the right-hand side. 7 Got it, yeah. 8 Q. Okay. And the consequences of the risk 9 are the consequences of those risks that are outlined 10 earlier in the report, right? 11 A. Yes. 12 Q. And these are consequences of risk to 13 various entities, correct? 14 A. Yes. 15 Q. One being people's health and their 16 safety, right? 17 A. Yes. 18 Q. And this is at the highest risk for the 19 people health and safety? 20 A. Yes. 21 Q. Then there's a financial impact as to what 22 those risks are and that would be a financial impact 23 to the company of roughly \$410 million, right? 24 A. Yes. 25 MR. DICKENS: You can put that aside.
572 1 Consent, yes. 2 Q. Okay. And what is Prior Informed Consent 3 for the Rotterdam Convention? 4 A. Right. So this would mean that paraquat 5 -- actually, more specifically, a formulation of 6 paraquat, so the Prior Informed Consent didn't apply 7 to the active ingredient; it applies to a formulation. 8 That would be on a list, I think it's called Annex 3 9 of the Prior Informed Consent, where certain -- which 10 would mean other actions would be needed in order to 11 allow the export and use of paraquat. 12 Q. And the concern was that if it was 13 included in that Prior Informed Consent, then that 14 would have an effect on other countries considering 15 paraquat registrations, right? 16 A. Yes, PIC listing would undoubtedly have 17 some implications. 18 Q. And then the paraquat issues leadership 19 team would meet to provide oversight to the management 20 of the license to operate for paraquat, right? 21 A. This was the purpose of the team, yes. 22 Q. Okay. And they would complete a document 23 similar to what you have here in front of you, right? 24 A. I don't know that this was a paraquat 25 issue leadership team document, but they certainly	574 1 Why don't we take a -- if we can take, 2 like, a ten-minute break, I'll see where I'm at. 3 THE VIDEOGRAPHER: We are going off the 4 record at 15:20. 5 (Break taken.) 6 THE VIDEOGRAPHER: We are back on the 7 record at 15:42. 8 MR. DICKENS: I'll hand you one big one, 9 Exhibit 87 for the record. 10 (Exhibit 87 marked for identification.) 11 MR. NARESH: It's 72, right? 12 BY MR. DICKENS: 13 Q. Dr. Botham, I've handed you a document 14 which is the "Final Report - the World Bank on 15 Paraquat and Possible Alternatives," dated March 1994. 16 This is a report you've reviewed 17 previously? 18 A. Yes, I've looked at this. 19 Q. Okay. And this report was specific to 20 identify paraquat and alternatives. Do you know why 21 this report was prepared? 22 A. No, I have asked that -- excuse me, I'll 23 just finish my biscuit. 24 No, I did ask that question, why was this 25 produced, who commissioned it. I've never received an

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575 1 answer to those questions. 2 Q. Okay. And you asked colleagues within 3 Syngenta? 4 A. I also asked my external counsel if they 5 could find any documents that would help to answer 6 that question, and nothing was apparent. 7 Q. Okay. If we can turn first to page 9378, 8 the Appendix 2 includes "Discussions with 9 Knowledgeable Persons." 10 Right? 11 A. Yes. 12 Q. And it notes: 13 "... the consultant visited the UK for 14 discussions with Zeneca [...], the principal 15 manufacturer of paraquat, in September and October 16 1993." 17 Right? 18 A. Yes. 19 Q. "... also visited Director of Medical 20 Research Council's toxicology unit." 21 Do you know who that was? 22 A. So we're talking about 1993. So was that 23 the time when Lewis Smith was director of that? 24 Q. Yeah, I believe if you turn -- I think 25 it's -- yep, page 386.	577 1 in the preparation that I've been through. 2 Q. If you turn back to the beginning, but 3 page 9258. At the very top of page 2, the document 4 states: 5 "The use of elaborate protective clothing 6 and equipment is unnecessary in routine application of 7 paraquat, provided proper application practice is 8 followed." 9 And is that a statement that Zeneca and 10 Syngenta provided to the World Bank with respect to 11 paraquat application measures? 12 MR. NARESH: Foundation. 13 THE WITNESS: Well, I think, again, we'd 14 have to go back and re-read again this document as to 15 whether that was reflecting an opinion given by 16 somebody else or whether it was a conclusion that the 17 -- Mr. -- Dr. Black had made himself. 18 BY MR. DICKENS: 19 Q. Okay. So it sounds like you don't know, 20 right? 21 A. No. 22 Q. Okay. 23 A. No. 24 Q. Do you agree with that statement, that the 25 use of elaborate protective clothing and equipment is
576 1 A. Yes, that's right, and that's confirmed 2 it. 3 Q. Okay. So that would have been Dr. Lewis 4 Smith at this time, right? 5 A. That's right, yes. 6 Q. Okay. So the consultant who prepared this 7 report had discussions with those within Zeneca, which 8 is now Syngenta, right? 9 A. Yes. 10 Q. As well as Dr Smith, right? 11 A. Yes. 12 Q. And those discussions involved paraquat 13 toxicology and poisoning, right? 14 A. That's right. 15 Q. And this report would have been received 16 by Syngenta after it was prepared in 1994, correct? 17 A. Yes. That's my assumption. 18 Q. Did Syngenta ever write to the consultants 19 or anyone who prepared this report and inform them 20 that anything included in their opinion was inaccurate 21 or incorrect? 22 A. I've had written -- had no documents that 23 surround this, if you wish, in terms of, you know, 24 either how it was commissioned or the consequences of 25 it having been published. It's a standalone document	578 1 unnecessary in routine application of paraquat, 2 provided proper application practice is followed? 3 A. I mean, that gives the impression that it 4 is not necessary to wear personal protective 5 equipment, and I certainly wouldn't agree with that. 6 Q. Page 4 includes a listing of some of the 7 alternatives that were available in 1994. Diquat's 8 listed, right? 9 A. Yes. 10 Q. That is a pesticide manufactured by 11 Syngenta? 12 A. Yes. 13 Q. Okay. It notes: 14 "From an occupational health viewpoint, 15 diquat is less hazardous than paraquat." 16 Right. 17 A. From an acute toxicity perspective, it 18 is not as toxic. 19 Q. Is it as toxic or more toxic from a 20 chronic toxicity standpoint? 21 A. There are no, sort of, major concerns 22 about chronic toxicity with diquat; so I think it's 23 equivalent in that sense. 24 Q. So equivalent from a chronic toxicity 25 standpoint and diquat is less acutely toxic; is that

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579 1 right? 2 A. Yes. Yeah, I mean, diquat, as it 3 indicates here, for example it tends to -- in chronic 4 toxicity studies, it tends to affect the kidney, 5 whereas paraquat affects the lung. But, you know, 6 there are no other significant differences. 7 Q. And diquat has been found not to 8 accumulate in the brain, right? 9 A. There's nowhere near the kind of extent of 10 database for me to give a kind of definitive position 11 on that. 12 Q. Okay. Glyphosate is also listed. We've 13 discussed that. That's the active ingredient in 14 Roundup and other glyphosate products, right? 15 A. Yes. 16 Q. Okay. And I believe you mentioned that, 17 from an acute toxicity standpoint, glyphosate is also 18 less hazardous than paraquat, right? 19 A. Yeah, and, yes, quite a bit more -- quite 20 a bit less hazardous from an acute toxicity 21 perspective. 22 Q. Okay. And -- 23 THE STENOGRAPHER: Sorry. One second, 24 please. 25 Could you say that answer again, please.	581 1 Q. And that's your understanding of 2 glyphosate as well? 3 A. It is. 4 Q. "Nonetheless, its concentrate formulation 5 can represent a significant hazard when ingested." 6 Right? 7 A. Yes. 8 Q. "This may be attributed to the relatively 9 high concentration of the [...] surfactant used in the 10 glyphosate concentrate which is more toxic than 11 glyphosate itself." 12 Right? 13 A. Yeah. It says that there. I mean, 14 I don't know, because glyphosate isn't a compound that 15 I have looked at in great detail, but, I mean, I -- 16 I don't know if that's a hypothesis or whether it's 17 actually got proven data. 18 Q. You know that glyphosate formulations 19 sold, at least in the United States, contain a 20 surfactant? 21 A. I don't know that, but -- no, I don't know 22 that. 23 Q. All right. 24 Turn to page 96, which is on the very top 25 of the page. The third paragraph on this page states:
580 1 THE WITNESS: Yeah, it's quite a bit -- 2 it's certainly significantly less hazardous than 3 paraquat from an acute toxicity perspective. 4 THE STENOGRAPHER: Thanks. 5 BY MR. DICKENS: 6 Q. Glyphosate was also -- I mean was already 7 an established alternative to paraquat in many 8 situations as of 1994? 9 A. Yes. By then, it was. 10 Q. And glufosinate's listed. That has a low 11 acute and chronic toxicity; that was an alternative 12 available in 1994? 13 A. Yes, indeed. Yes. 14 (Stenographer interjection.) 15 MR. DICKENS: Yes. Sorry. 16 BY MR. DICKENS: 17 Q. Turn to page 9341. 18 There's a "Comparison of Glyphosate to 19 Paraquat" listed here, right? 20 A. Yes, that's right. 21 Q. Okay. It notes glyphosate: 22 "... has little dermal irritancy and 23 is not corrosive, unlike paraquat concentrate." 24 Right? 25 A. Right.	582 1 "The use of traditional protective 2 clothing and apparatus is impractical in tropical 3 climates." 4 And that is something Syngenta knew at 5 this point in 1994, right? 6 A. "Impractical" is, as we've discussed in 7 the past -- I mean, the practicality of -- in tropical 8 climates can mean, for example, the use of such 9 protective equipment may be more difficult in very hot 10 climate. It doesn't mean to say that it isn't still 11 Syngenta's view that such a PPE should be worn. 12 Q. Syngenta clearly knew from its habitual 13 biomonitoring studies that individuals living in 14 tropical climates were not following the PPE 15 recommendations, right? 16 A. In some cases but not all. 17 Q. In all of -- are you aware of any habitual 18 biomonitoring study undertaken by Syngenta in which 19 all applicators complied with the PPE requirements? 20 A. I think I would need to go back and look 21 at all the detail of the study. 22 Q. Certainly, the Malaysian biomonitoring 23 studies we looked at, there was not a following of the 24 PPE, right? 25 A. There were examples of that, yes. But,

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583 1 equally, we know from the people who are in that part 2 of the world that those studies certainly do show that 3 not everybody wore PPE, but, you know, there has 4 continued to be ongoing training for people in those 5 parts of the world and, you know, PPE is generally 6 worn. 7 Q. If we can turn to page 147, which is on 8 the top of the page. 9 Specifically, that includes an appendix, 10 "A Farm-Level Framework for Pesticide Training," 11 right? 12 A. Right. 13 Q. And this is based on a paper prepared by 14 M.J. Whittaker at ICI? 15 A. Yes, that's right. 16 Q. Do you know M.J. Whittaker? 17 A. No, I don't. 18 Q. And this farm-level framework for 19 pesticide training, if we can turn to page 30 of this 20 report, so a couple pages back -- 21 MR. NARESH: Sorry, you're mixing 22 different numbers. 23 MR. DICKENS: Yeah, I think -- I keep 24 jumping. On the bottom now, so ending in Bates number 25 9407.	585 1 is particularly for people who were in countries 2 outside of the Western world, if you like, who may 3 require additional mechanisms in order to make sure 4 that they understand what they need to do and how to 5 use the product safely. 6 Q. Okay. We can put that aside. 7 Dr. Botham, you, in your notes, Exhibit 1 8 to this deposition, there is a list of ILSI/HESI 9 payments? 10 Do you see? 11 A. Yes. 12 Q. ILSI, I-L-S-I, slash, H-E-S-I. 13 Correct? 14 A. That's right. 15 Q. And ILSI/HESI is a group that is looking 16 at risk assessments, right? 17 A. Yes. 18 Q. And risk assessments within the United 19 States specifically? 20 A. Well, it has some focus in the United 21 States, but, no, it's -- HESI -- let me explain. 22 ILSI is the International Life Sciences Institute. 23 HESI is the Health and Environmental Safety Institute. 24 So HESI used to be on, if you like, a branch of ILSI, 25 but now HESI is a separate organization.
584 1 THE WITNESS: I'm there. 2 BY MR. DICKENS: 3 Q. Okay. The second paragraph begins: 4 "However, one cannot simply rely on 5 labels, even with improvements to bring about 6 significant changes of standards-in-use." 7 And earlier, it lists some various ways of 8 education of individuals about information on the 9 labeling, right? 10 A. Right. 11 Q. All of these on-pack leaflets, wall 12 posters, mass media, videos, aids, these were 13 available means by which to get information to 14 consumers of paraquat, right? 15 A. To users of paraquat. 16 Q. That's right. 17 A. Mmm. 18 Q. And that includes users in the United 19 States? 20 A. Yes, but -- and this was, I think, broader 21 than paraquat, isn't it? So this is about 22 agrochemical use generally. 23 Q. That's right. But it's true with respect 24 to paraquat that those methods were available, right? 25 A. Yeah, but it looks like the focus of this	586 1 Q. And -- 2 A. Okay. 3 Q. I'm sorry. 4 A. Can I just finish? 5 Q. Yeah, yeah. 6 A. Yeah. So the work that is done by ILSI is 7 certainly international, so there's an ILSI Europe, 8 for example. HESI, on the other hand, although there 9 are facets of global implications of what they do, a 10 lot of their focus has been in the United States. 11 Q. And with respect to HESI and those 12 operating within the United States, there's 13 individuals from chemical companies, EPA, as well as 14 other consultants, right? 15 A. Yes. This is not restricted to 16 agrochemicals; it's chemicals as well. 17 Q. And in tab 5 of the notes that you brought 18 here today, there's a list of payments, right? 19 A. Yes. 20 Q. And this just lists the date and the 21 payment that was given, correct? 22 A. Correct. 23 Q. Did you prepare this? 24 A. No. I actually asked for it to be 25 prepared because I knew that we were paying for

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587 1 involvement in projects under HESI, as well as, if you 2 like, an annual fee, so this was just to make sure 3 that it was all to hand. 4 Q. Okay. And did you calculate the total 5 amount of payments to HESI included here? 6 A. No, I have not done that. 7 Q. Okay. I'll represent, my quick addition, 8 it's a little over 1.7 million from 1997 to 2023. 9 Is that fair? 10 A. I don't have any reason to dispute that. 11 Q. Do you know if there has been any other 12 payments since November 29 of 2023? 13 A. Right. Well, the payments to HESI will 14 take place, as this indicates, in November of -- or 15 later on in the year, normally, so one would expect 16 that there would be payments due later in 2024 17 because, yes, we are still involved with HESI. 18 Q. Okay. And some of these payments are for 19 significantly more money, such as the payment on 20 November 16, 2023 for \$125,000. 21 Do you know what that payment is for 22 specifically? 23 A. Well, the larger figures, generally, are 24 for involvement in specific projects as against the 25 membership fee, to put it simply. That is, therefore,	589 1 A. I don't know because she's not with 2 the company anymore. 3 Q. Who with the company is still on a 4 committee or subcommittee of HESI or ILSI, if you 5 know? 6 A. One example would be Richard Currie. 7 Q. Do you know of any others? 8 A. No. That's the one thing that I didn't -- 9 I didn't get a chance to get the latest definitive 10 list, and so I can't give you other names right now. 11 Q. That's fine. Are you familiar with the 12 epidemiologist Douglas Weed? 13 A. Yes. 14 Q. Did you know him prior to preparing for 15 the deposition? 16 A. Yes, but not -- I don't know him 17 personally. I don't think I've ever met him but I'm 18 certainly aware of the work that he's done. 19 Q. Okay. Douglas Weed is a member of HESI? 20 A. He was, yes. I don't know if he still is. 21 Q. Okay. And he was on the committee that 22 was chaired by Sue Yi, right? 23 A. I think that's right, yes. 24 Q. And you've never had any personal 25 conversations -- you didn't know Doug Weed beforehand?
588 1 why those larger sums are variable, because we've been 2 involved in projects that have then stopped or we've 3 decided that project is no longer relevant for us. 4 Q. And do you know what project the payments 5 were for in 2023? 6 A. No, I wouldn't be able to list those 7 accurately, but, I mean, I -- there are certainly 8 examples that I'm aware of. One example is the HESI 9 project that's called Transforming the Evaluation of 10 Agrochemicals and that's a project looking at how we 11 can, in toxicology and environmental safety, bring in 12 new methods to assess safety and eventually perhaps 13 for those to become the new regulatory requirements. 14 Q. Now, Syngenta has employees who are on 15 committees and subcommittees within HESI as well as 16 ILSI, right? 17 A. Yes. More now HESI rather than ILSI, yes. 18 Q. And that includes being chairpersons of 19 certain ILSI or HESI committees? 20 A. Yes. 21 Q. An example is Sue Yi is a co-chair of a 22 committee; is that right? 23 A. She was. I don't know whether she still 24 is. 25 Q. Is she still with the company?	590 1 A. No, no. No, indeed. 2 Q. Now, Syngenta manufactures other 3 pesticides other than paraquat, correct? 4 A. Correct. 5 Q. Are any of the other pesticides 6 manufactured by Syngenta associated or have been 7 associated in the literature with neurotoxicity? 8 A. If you're talking neurotoxicity, which is, 9 again, a very broad term, is that your intent or do 10 you want to be specific? 11 MR. NARESH: Yeah, let me object on -- 12 MR. DICKENS: Let me get to this. 13 MR. NARESH: -- scope and foundation. 14 I think your topic is specific to 15 Parkinson's disease. 16 MR. DICKENS: Got it. 17 BY MR. DICKENS: 18 Q. Are any of Syngenta's other pesticide 19 products linked or associated with Parkinson's disease 20 in the literature? 21 A. Not as far as I'm aware. 22 Q. And that question, I'll expand it a little 23 to are any of the other pesticides managed by Syngenta 24 linked to neurotoxicity in humans -- 25 MR. NARESH: I'll object on --

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591 1 BY MR. DICKENS: 2 Q. -- to your knowledge? 3 MR. NARESH: -- scope and foundation. 4 THE WITNESS: Well, that's why that's a 5 very broad question because you can, for example, say 6 that there are insecticides which can affect the 7 nervous system, like sheep dip is a great -- good 8 example. 9 BY MR. DICKENS: 10 Q. Okay. But it's fair to say that none of 11 Syngenta's other pesticides that they manufacture 12 have been associated with Parkinson's disease in any 13 way? 14 A. As far as I know, that's correct. 15 Q. And have any of the other pesticides 16 manufactured by Syngenta been associated with 17 Parkinson's disease based on any internal Syngenta 18 studies? 19 MR. NARESH: Scope, foundation. 20 THE WITNESS: Not that I'm aware of. 21 BY MR. DICKENS: 22 Q. Has Syngenta ever undertaken an 23 epidemiology study on any of its other pesticides to 24 determine whether or not their pesticides are 25 associated with Parkinson's disease?	593 1 what I've been given is that we did not. 2 MR. DICKENS: Thank you very much. I have 3 no further questions for today. 4 MR. NARESH: Counsel for FMC or Chevron, 5 do you have any questions? 6 MS. SIMMS: No questions for Chevron. 7 Thanks, Ragan. 8 MS. BOSTON: No questions for FMC. 9 EXAMINATION ON BEHALF OF SYNGENTA 10 BY MR. NARESH: 11 Q. All right. Okay. Dr. Botham, do you have 12 -- is that list of exhibits -- 13 A. This is in numerical order. 14 Q. Reverse numerical? 15 A. Yes. 16 Q. Okay. 17 Dr. Botham, I'd like to ask you some 18 follow-up questions -- 19 A. Sorry, Ragan, have we got -- 20 Q. Yeah. 21 A. -- can I just move this out of the way -- 22 Q. Please, yeah. 23 A. -- because I'd be fearful of looking for 24 documents and spilling. 25 MR. NARESH: Yeah. Oh, you're still
592 1 MR. NARESH: Same objections. 2 THE WITNESS: Syngenta has not done that. 3 There may be external epidemiology studies that have 4 looked at -- well, there are. There are other -- 5 there are external epidemiology studies that looked at 6 a range of pesticides and some of those may well be in 7 the Syngenta product list. 8 BY MR. DICKENS: 9 Q. So Syngenta's position is that none of the 10 pesticides that it sells are -- or cause Parkinson's 11 disease in any way? 12 A. Absolutely. 13 Q. You mentioned earlier in the deposition 14 you weren't aware of Syngenta selling or marketing 15 paraquat for residential use in the United States. 16 Do you know whether or not Syngenta ever 17 sold or marketed paraquat for residential use in 18 Taiwan? 19 A. I did ask that question and I have been -- 20 I've been given no evidence that it did so. 21 Q. Okay. Have you been given any evidence 22 that it did not so? 23 A. Yeah, I think -- 24 Q. What a question. 25 A. As much as I can, all the indications from	594 1 connected. 2 THE WITNESS: Oh, sorry. I'm sorry. 3 MR. NARESH: You okay? 4 THE WITNESS: Never put me on TV. I think 5 I've -- I'm sorry, I think I've lost the clip. 6 MR. NARESH: Let's go off the record. 7 Let's just get -- let's get this sorted here. 8 MR. DICKENS: Okay. 9 THE VIDEOGRAPHER: We are going off the 10 record at 16:09. 11 (Off the record.) 12 THE VIDEOGRAPHER: We are back on the 13 record at 16:10. 14 BY MR. NARESH: 15 Q. Dr. Botham, I'd like to ask you some 16 follow-up questions, and I know it's been a long 17 couple days, so I will go as quickly as I can. 18 But could you please pull out Exhibit 86, 19 which is one of the later exhibits that were shown to 20 you today. 21 A. Got it. 22 Q. And is Exhibit 6 [sic] the document with 23 the "Risk Title: 10.2 paraquat"? 24 A. Yes, that's correct. 25 Q. I just had a couple of specific questions.

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595 1 If you look at the right-hand side of the page, there 2 is a box called "Managed trend." 3 Do you see that? 4 A. Right, yes. 5 Q. And the font is very, very small on that, 6 right? 7 A. It is, yes. 8 Q. And then, below that, there's a box called 9 "Consequences of Risk." 10 Right? 11 A. Yes, there is, yes. 12 Q. And the first bullet under Consequences of 13 Risk said "People health and safety" and the number 14 4 -- 15 A. Yeah. 16 Q. -- is circled, right? 17 A. Yes. 18 Q. And you were asked by plaintiffs' counsel 19 whether or not that indicated the highest possible 20 risk? 21 A. Right. 22 Q. And I think you said yes, right? 23 A. That was my assumption, certainly, but 24 this is a very difficult document to read. 25 Q. And, Dr. Botham, I'm going to hand you	597 1 exploring today, because we are aware of the hazards 2 of paraquat mainly in terms of its acute toxicity. We 3 aim to protect people from that toxicity, and, 4 in terms of neurotoxicity, we believe that there is no 5 causative link between paraquat and Parkinson's 6 disease. 7 Q. Okay. I'd like to shift gears and I'm 8 going to eventually, pretty soon, going to get to some 9 of the earlier documents from yesterday, so if you 10 need a moment to get sorted, just let me know. 11 But let me ask -- let me start it this 12 way: Do you remember yesterday morning you were asked 13 a number of questions about changes in the brains of 14 paraquat-poisoning victims? 15 A. Yes. 16 Q. When someone dies from paraquat poisoning, 17 how are they typically being exposed to paraquat? 18 A. Well, we're talking about either 19 deliberate ingestion or accidental ingestion. 20 Q. Ingestion of paraquat concentrate? 21 A. Of paraquat concentrate. Sometimes 22 paraquat formulation but usually paraquat concentrate. 23 Q. How is that different from how workers are 24 exposed to paraquat in their fields and orchards? 25 A. Hugely different. You're swallowing
596 1 a magnifying glass that's on my phone. 2 A. Okay. 3 Q. I don't know if you've used one of these 4 before. 5 A. No, never. 6 Q. If you hover it over the "Managed trend," 7 do you see that on the bottom axis there is a 8 numerical scoring of risks --- 9 A. Oh, right, okay. Yeah. 10 Q. -- of 1 being Catastrophic -- 11 A. Yeah. 12 Q. -- to 4 being Marginal? 13 A. So there is. 14 Q. And is that -- having reviewed the matrix 15 with the magnifying glass, does that help you 16 understand what those numbers on Exhibit 86 in box 10 17 are intended to indicate? 18 A. Yes, it does. 19 Q. And what, then, is the risk to people 20 health and safety reflected by Exhibit 86? 21 A. Right. Well, that makes a lot more sense 22 now that I see that. Number 4 is Marginal. 23 Q. And why would the risk of people health 24 and safety be listed as marginal in this document? 25 A. I think for many of the reasons we've been	598 1 paraquat at high concentrations into the -- it gets 2 into the stomach, rapidly absorbed at high 3 concentrations. Someone out in the field is 4 potentially being exposed through the skin or maybe by 5 inhalation, but to dramatically lower concentrations 6 of paraquat. 7 Q. Now, when that much paraquat gets into 8 someone's system, are you familiar with what happens 9 to the organs in the body? 10 A. Yes, yes. I mean that's something which 11 we -- is much better understood. There are what you 12 call target organs for paraquat's toxicity. So 13 paraquat gets to certain organs in the body and 14 particularly damages them, and the main one for 15 paraquat is the lung. 16 Q. Okay. And are you familiar with a term 17 called anoxia? 18 A. Yes, I am. 19 Q. What is anoxia? 20 A. It means a deficiency in oxygen. 21 Q. And if the lung is damaged, can that cause 22 anoxia? 23 A. Indeed, because that's how you get 24 oxygenation of the blood, through breathing of the air 25 into the lungs and that gets transported into the

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599 1 blood. 2 Q. Can anoxia affect the brain? 3 A. Absolutely, yes. 4 Q. How so? 5 A. Because if you are causing damage to the 6 lungs, the blood becomes less oxygenated. That blood 7 circulates to the brain and the brain is starved of 8 oxygen, and the brain is a very susceptible organ to 9 lack of oxygen. 10 Q. Now, you were shown yesterday morning 11 a document that was marked as Exhibit 4. 12 Can you see if you can find it? 13 A. Yes, I've got it. 14 Q. This was the autopsy report of somebody 15 who died of paraquat poisoning, right? 16 A. Yes, that's right. 17 Q. Plaintiffs' counsel showed you page 3 of 18 the document, and at the top there's a title, 19 "Histology." 20 Right? 21 A. Yes. 22 Q. And the first organ identified in the 23 histology section is the brain -- 24 A. Yes. 25 Q. -- right?	601 1 "alveolar"? 2 A. "Intra-alveolar fibrosis." 3 Q. Okay. And it goes on to say: 4 "This gravely diminished the capacity of 5 the lungs to undertake gas exchange and during life 6 the oxygen [something] in the blood reached very low 7 levels..." 8 A. Oxygen -- I think that's probably 9 "attention," yes. 10 Q. Okay. Is that describing anoxia? 11 A. Absolutely it is, yes. 12 Q. And then it goes on to say in the next 13 sentence: 14 "This degree of anoxia probably 15 [something] the degenerative changes in the brain." 16 A. Yeah. 17 Q. Can you read what that says? 18 A. Yeah, I think it says "produced." 19 Q. "Produced," okay. So what does this tell 20 you about what caused the changes in the brain? 21 A. Right, so this says that the pathologist 22 was pretty sure that, given the extensive damage to 23 the lungs, that that damage to the brain was not 24 actually due to the paraquat directly; it was because 25 of the indirect effect of paraquat on the lung causing
600 1 A. Yes. 2 Q. And plaintiffs' counsel asked you some 3 questions about the degenerative changes listed in the 4 brain, right? 5 A. Yes. 6 Q. But plaintiffs' counsel did not show you 7 the next page, which is the summary, right? 8 MR. DICKENS: I'll object to the form. 9 THE WITNESS: Okay, yes, fine. 10 BY MR. NARESH: 11 Q. And here, in the summary, the first 12 sentence says: 13 "The gross and microscopic findings in 14 this case are consistent with those found following 15 the ingestion of paraquat." 16 Right? 17 A. That's right, yes. 18 Q. So what does that tell you about how this 19 person was exposed to paraquat? 20 A. It's as we've been saying before. I mean, 21 the person obviously swallowed paraquat and that has 22 shown up in the damage to the lung. 23 Q. Okay. And then it goes on to say: 24 "The lungs show extensive degeneration..." 25 And I can't read the next couple of words,	602 1 a lack of oxygen getting to the brain and hence the 2 damage. 3 Q. Does Exhibit 4 tell us anything about 4 whether paraquat crossed the blood-brain barrier in 5 this particular instance? 6 A. No, it doesn't tell you anything about 7 that. 8 Q. You were also asked some questions, 9 immediately after being shown this document, about 10 whether autopsy reports showed that paraquat gets into 11 the brains of farmers. 12 Do you remember that? 13 A. Yes, I do recall that being said. 14 Q. Do autopsy reports like Exhibit 4 tell us 15 anything about whether paraquat is getting into the 16 brains of farmers working in their fields and 17 orchards? 18 MR. DICKENS: Object to form. 19 THE WITNESS: Well, although this is a 20 farm worker, this is a farm worker who had ingested 21 paraquat, and if we're talking about farm workers who 22 were using paraquat, then their exposure to paraquat 23 would be significantly lower, maybe even non-existent, 24 in comparison. 25 So this does not in any way read across to

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603 1 farmers using paraquat. 2 BY MR. NARESH: 3 Q. You were asked some questions about 4 Industrial Biotech [sic]. 5 Do you remember those questions? 6 A. Yes, yes. 7 Q. It's sometimes been referred to as IBT, 8 right? 9 A. Yes, yes. 10 Q. Overall, to your knowledge, about how many 11 safety studies would you say Syngenta has done related 12 to paraquat? 13 A. Well, we have looked at that over the 14 recent years and we estimate we've done something like 15 1200 studies. 16 Q. And what percentage of those would you say 17 were conducted by IBT? 18 A. Well, we -- my list here suggests that, 19 you know, we're talking about six -- six, seven 20 studies at most. 21 Q. And we've been doing a lot of math on the 22 fly, but is it fair to say that that is a vanishingly 23 small percent of the studies? 24 A. It is, yeah. 25 MR. DICKENS: Object to form.	605 1 A. That's correct. 2 Q. If you look at page 6, I'd like to focus 3 on a couple of the sections that plaintiffs' counsel 4 did not ask you about, okay. 5 It says in the -- it looks like the second 6 full paragraph, the one beginning "EPA have 7 requested..." 8 Do you see that? 9 A. Yes. 10 Q. It says: 11 "EPA have requested that paraquat studies 12 be reviewed. Since Chevron submitted the data to the 13 EPA, it was agreed that they would review the studies, 14 although PPD were the customer." 15 Do you see that? 16 A. Yes. 17 Q. And what is that -- what is your 18 understanding of what that means? 19 A. So EPA have requested the paraquat studies 20 be reviewed. I mean, I assume that means the paraquat 21 studies that existed at the time, and so they are 22 going to review those studies. 23 Q. And then it goes on, two paragraphs down, 24 to say: 25 "In conclusion, there would be no new
604 1 THE WITNESS: Absolutely; well less than 2 1 percent, yes. 3 BY MR. NARESH: 4 Q. Okay. Well, to cure the objection, let me 5 ask it this way: Approximately, what percentage is 6 6 of 1,200? 7 A. Well, 6 over 1000 would be 0.6 percent. 8 Q. Okay. If you could please pull out 9 Exhibit 11. 10 A. Got it. 11 Q. Now, Exhibit 11 was a document that you 12 were shown in your examination yesterday that related 13 to the subject of the IBT scandal, right? 14 A. Yes. 15 Q. And if you look at page 6 -- and by "6," 16 I'm looking at the numbering at the very top of the 17 document. If you're looking at the bottom, it's 6542. 18 A. Mmm-hmm, yeah, okay. 19 Q. And you were asked some questions about 20 this page. 21 Do you remember those questions? 22 A. Yes, yes. 23 Q. And the subject matter of this section is 24 the "Industrial Bio-Test Laboratory - 2-year rat and 25 dog studies," right?	606 1 registrations until the studies have been repeated and 2 evaluated." 3 A. Exactly; so recognizing that there were 4 deficiencies in those studies, investment was made in 5 repeating those studies. 6 Q. And after repeating those studies, was 7 paraquat registered for use in the United States? 8 A. It was. 9 Q. You were asked some questions about 10 a gentleman named Maurice Green and his firm 11 Clement & Associates. 12 Do you remember that? 13 A. I do. 14 Q. And the time period of those questions was 15 about Mr. Green's role with regard to EPA registration 16 in the early 1980s. 17 A. Right. 18 Q. Since the early 1980s, has the EPA studied 19 paraquat's registration? 20 A. Yes. And on more than one occasion. 21 Q. And has it studied the 22 paraquat/Parkinson's hypothesis? 23 A. It has. And, again, more than once. 24 Q. Did Mr. Green, or Clement & Associates, to 25 your knowledge, have any involvement with any of those

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607 1 reviews after the early 1980s? 2 A. I'm not aware that he would have been, no. 3 Q. Okay. Now let's look at Exhibit 15, 4 please. 5 A. Got it. 6 Q. Okay. Exhibit 15 was a memo from 1980 7 that you looked at yesterday with plaintiffs' counsel, 8 right? 9 A. Right. 10 Q. And the questioning -- you had some 11 questioning on the first page, which was related to 12 the sentences about the chances of an RPAR being 13 issued at all seems to be declining, and the following 14 sentence: 15 "As we already know Clement Associates 16 have been assigned the job of reviewing the database 17 on PQ for EPA." 18 A. Yes. 19 Q. Do you remember that question? 20 A. I do. I do remember that, yes. 21 Q. And Clement Associates is Mr. Green's 22 firm, right? 23 A. That is correct. 24 Q. If you look at page 6, again I'm looking 25 at the numbering at the top. It's page 6001 if you	609 1 Q. And you weren't asked about any of those, 2 were you? 3 A. No, I wasn't. 4 Q. Well, let's go through those. First: 5 "The effect of Dr. Rose's input into the 6 marijuana saga [...] which has received more favorable 7 publicity." 8 Right? 9 A. Right. 10 Q. Second: 11 "Negligible accidents and few suicides in 12 the USA and relative success in treatment of poisoning 13 incidents..." 14 Right? 15 A. Correct. 16 Q. Third: 17 "No significant oncogenic concern 18 regarding paraquat..." 19 A. Yes. 20 Q. "... (contrast most compounds in RPAR)." 21 Right? 22 A. Yes. 23 Q. And fourth, and last: 24 "The apparent receding in significance of 25 the EPA-sponsored Californian epidemiological study."
608 1 look at the Bates number. 2 A. Yes. 3 Q. And you were asked some questions about 4 this page as well, right? 5 A. Yes. 6 Q. You were asked about -- I think it's 7 probably the second full paragraph, beginning 8 "Messages received..." 9 Do you see that? 10 A. Yes. 11 Q. It says: 12 "Messages received from Don Dye (Chevron's 13 representative in Washington) are that pressures on 14 paraquat seem to have been relaxed somewhat." 15 A. Yes. 16 Q. You were asked about that and you were 17 asked about the following sentence. 18 But at the bottom of that paragraph, 19 it says: 20 "Some of the reasons for this more relaxed 21 view are..." 22 And then it goes on to identify four 23 specific reasons why the EPA no longer seems to be 24 leaning towards issuing an RPAR, right? 25 A. Yes, that's correct.	610 1 Right? 2 A. Right. 3 (Stenographer interjection.) 4 BY MR. NARESH: 5 Q. None of the reasons identified in this 6 document have anything to do with the fact that EPA 7 was using Clement Associates; is that right? 8 A. Yes. No, not at all, no. 9 Q. Okay. You can put that one to the side. 10 You were asked earlier today about 11 something called Inteon, right? 12 A. Yes. 13 Q. And you were asked about whether Inteon 14 was a safer formulation of paraquat, right? 15 A. I was. 16 Q. And I believe you testified that Inteon 17 was meant to protect against poisoning? 18 A. Acute toxicity, in other words, yes, 19 that's right. 20 Q. And so that -- you anticipated my 21 question. Poisoning, is that an issue of acute 22 toxicity or chronic toxicity? 23 A. Yeah, it is acute toxicity. So if you 24 accidentally swallow, where you get immediate or 25 slightly delayed effects, yes.

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611 1 Q. And you were asked about the term 2 "emetic." Just so -- I don't think we ever defined 3 that term. What does the term "emetic" mean? 4 A. Okay, right. So an emetic is a substance 5 which induces nausea and then vomiting. 6 Q. And all that questioning about the 7 addition of the emetic was to guard against what risk? 8 A. Well, that -- emetic is added to allow if 9 a person does, particularly accidentally, consume 10 paraquat, that they -- that emetic would help to 11 remove that ingested paraquat from the stomach very 12 quickly. 13 Q. And the allegation in this case is that 14 paraquat allegedly caused plaintiffs' Parkinson's 15 disease. 16 You understand that? 17 A. Yes, I do understand that. 18 Q. Now, is the question of whether paraquat 19 is capable of causing Parkinson's disease one of acute 20 toxicity or chronic toxicity? 21 A. Very much chronic toxicity. I mean, the 22 assumption, quite rightly, I think here is that in 23 order to -- for any environmental agent to be 24 responsible for Parkinson's disease, it would have to 25 happen over a long period of time.	613 1 is not the product that we want on the market. 2 Q. I want to go back to yesterday's testimony 3 about intranasal and inhalation studies. 4 Do you remember being asked some questions 5 about that? 6 A. Yes, I do, yeah. 7 Q. And I don't think that we described what 8 those studies are, so at a very high level, what is an 9 intranasal study? 10 A. Right. So this is the administration -- 11 and we're talking about experimental animal studies 12 here, of course, not human studies. So this is the 13 administration to animals, and these again would 14 normally be rodents, directly into the nose of those 15 animals. So you have to put a probe, a catheter, into 16 those animals and almost force the material into the 17 top of the nose. 18 I almost -- I sometimes describe it as 19 being equivalent to the intraperitoneal injection into 20 the abdomen. It's a very extreme way to expose an 21 animal. It's not the way in which you get exposed -- 22 a human would be exposed to something in practice. 23 Q. Okay. And then the other -- well, to your 24 knowledge, what is the point of an intranasal study 25 with respect to the blood-brain barrier?
612 1 Q. The questioning that you had about Inteon, 2 now, did any of that have anything to do with 3 paraquat's chronic toxicity? 4 A. No. 5 MR. DICKENS: Object to form. 6 THE WITNESS: Nothing, as far as I'm 7 concerned, no. 8 BY MR. NARESH: 9 Q. Did it have anything to do with whether or 10 not paraquat is capable of causing Parkinson's 11 disease? 12 A. Absolutely nothing. 13 Q. Now, you mentioned, in response to some of 14 the testimony, that the decision to withdraw Inteon 15 was something that should be seen in a positive light. 16 Do you remember that testimony? 17 A. I do. 18 Q. And what did you mean by that? 19 A. Well, when we discovered through that 20 post-marketing surveillance, I think was the phrase 21 that I was using, that actually, perhaps, Inteon 22 was not giving the improved -- or the degree of 23 improved safety that we hoped for, together with the 24 fact that there were some efficacy and application 25 problems, we took a decision to say, right, this	614 1 A. Well, people believe that -- well, there 2 is a direct route from the olfactory bulb, which is 3 between the top of the nasal cavity and the brain, 4 that, through intranasal administration, you can 5 increase the availability of a substance. 6 And this is talking about the 7 pharmaceutical use, for example, of -- in getting 8 drugs to treat brain disease, so that will be one way 9 in which you could actually achieve that. 10 Q. Now, by contrast, what is an inhalation 11 study? 12 A. Right. So inhalation is very different. 13 So, here, we're talking about -- and there are two 14 types of inhalation study. There's what's called 15 whole-body inhalation study. So, again, this is an 16 experimental animal, not a human being. It's put into 17 a chamber into which an atmosphere -- the atmosphere 18 is filled with a concentration of the chemical. Not 19 an atmosphere that's deficient in oxygen; so the 20 animal can still breathe and so on, but it is able to 21 inhale that atmosphere and therefore become exposed to 22 it. 23 A more, I guess, directed way of doing 24 that is through what's called nose-only exposure and 25 that is where, let's put it this way, like a mask is

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615 1 fitted to an animal, the animal is more restrained, 2 unlike the previous situation, but it allows you to 3 more directly allow that animal to breathe the 4 atmosphere. 5 Q. Okay. Did Syngenta conduct any inhalation 6 studies of paraquat? 7 A. Yes, it did. 8 Q. Why did Syngenta conduct inhalation 9 studies, not intranasal studies, of paraquat? 10 A. Well, the main reason is that the 11 inhalation studies are a somewhat better 12 representation of the way in which humans could be 13 exposed because you're breathing in air containing 14 material. 15 Secondly, they are the regulatory-required 16 protocols for such studies. 17 Q. I'd like to shift gears a little bit and 18 ask you a little bit about labels. You were asked a 19 number of questions about some memos discussing the 20 paraquat labels, but we didn't look at a lot of labels 21 over the last two days. 22 You can reference this if you'd like to, 23 so you may want to go find Exhibit 38. 24 A. Okay, got it. 25 Q. And this was a memo from Dr. Swan in 1966	617 1 symbol just there. I can see that. 2 Q. So even though Dr. Swan wasn't 3 enthusiastic about the idea of adding a skull and 4 crossbones, a skull and crossbones was added anyway, 5 right? 6 A. It was, yes, yes. 7 Q. Okay. You can put that down. 8 You were shown Exhibit 40. 9 A. Yep, got it. 10 Q. And this was a 1969 memo in which ICI 11 discusses the fact that there can be delayed irritant 12 effects of paraquat. 13 Do you remember that? 14 A. Yes. 15 Q. And you were also asked some questions 16 yesterday about whether breathing spray mist can cause 17 respiratory tract irritation. 18 Do you remember that questioning? 19 A. Okay, yes. 20 Q. But we didn't look at the labels from the 21 time period, so let me hand you the label from the 22 year before, which is 1968. 23 MR. NARESH: I'll mark that Exhibit 89. 24 (Exhibit 89 marked for identification.) 25 ///
616 1 about whether or not to add skull and crossbones to 2 the label of paraquat, right? 3 A. Yes, that's right. 4 Q. And there was some questioning yesterday 5 about whether or not Dr. Swan liked the idea of a 6 skull and crossbones on the label. 7 Do you remember that? 8 A. Yes, I do remember that, yeah. 9 Q. But we didn't look at the label. 10 MR. NARESH: So let's look at the label. 11 Dr. Botham, I'm handing you what's been marked 12 Exhibit 88. 13 (Exhibit 88 marked for identification.) 14 BY MR. NARESH: 15 Q. It's very small but we're not going to 16 actually read any of the text. This is printed out to 17 fit on one page. 18 THE STENOGRAPHER: Sorry, is that 88? 19 MR. NARESH: 88, yes. 20 THE STENOGRAPHER: Thanks. 21 BY MR. NARESH: 22 Q. And, Dr. Botham, does it look like, in 23 fact, a skull and crossbones was added to the label in 24 1969? 25 A. Yeah, sure, there's a skull and crossbones	618 1 BY MR. NARESH: 2 Q. This one's printed out over two pages and, 3 again, Dr. Botham, if you'd like the magnifier, I'm 4 happy to do it. 5 A. Okay. 6 Q. Just let me know when you've had a moment 7 to familiarize yourself with it. 8 A. Yeah, okay, go ahead. 9 Q. And let's look at the last page of the 10 document. 11 A. Mmm-hmm. 12 Q. There's a stop sign? 13 A. Yes. 14 Q. And the stop sign says: 15 "Do not inhale. Do not get on skin. 16 Do not take internally." 17 Right? 18 A. That's correct. 19 Q. And that's what the label was saying in 20 1968, right? 21 A. That's correct. 22 Q. And below that, it says "Warning"? 23 A. Yes. 24 Q. And it says: 25 "May be fatal if swallowed, inhaled or

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1 absorbed through the skin." 2 Right? 3 A. Yes. 4 Q. It says: 5 "Prolonged skin contact will cause severe 6 irritation." 7 Right? 8 A. Yes. 9 Q. And it goes on to say: 10 "Do not get material on skin, eyes or 11 clothing." 12 Right? 13 A. Yes. 14 Q. It says: 15 "Repeated contact with skin may increase 16 danger of absorption." 17 Right? 18 A. Yes. 19 Q. And it says: 20 "Symptoms of injury may be delayed." 21 Right? 22 A. That's right. 23 Q. It also says, and we can read all of it, 24 but to keep us moving, go down a line or two where it 25 says:	619 621 1 A. -- case, yes. 2 Q. And the Ferebee lawsuit, did that have 3 anything to do with paraquat allegedly having a 4 neurotoxic effect? 5 A. Absolutely nothing to do with that, no. 6 Q. Did the Ferebee lawsuit have anything to 7 do with paraquat allegedly causing Parkinson's -- 8 (Stenographer clarification.) 9 BY MR. NARESH: 10 Q. Did the Ferebee lawsuit have anything to 11 do with the allegation that paraquat caused 12 Parkinson's disease? 13 A. No, nothing at all. 14 Q. You were asked some questions about the 15 memo suggesting that ICI did not want to warn that 16 dermal exposure could be fatal, right? 17 A. Yes. 18 MR. DICKENS: Object to the form. 19 BY MR. NARESH: 20 Q. Do you remember that testimony? 21 A. Yes, I do remember that discussion. 22 Q. But, again, you were not shown the label 23 from before or after this memo, were you? 24 A. No, I was not. 25 Q. So let's look at the label from 1982,
620 1 "Do not breathe spray mist..." 2 Do you see that? 3 A. Mmm. Yes, indeed. 4 Q. It says: 5 "Do not breathe spray mist in order to 6 avoid nasal, throat and respiratory tract irritation." 7 Right? 8 A. Yes. 9 Q. "When spraying or when contacting sprayed 10 vegetation wet with spray, dew or rainwater, wear 11 waterproof footwear and clothing." 12 Right? 13 A. Yes. 14 Q. And so this was all warned as early as 15 1968, right? 16 A. Okay, right. 17 Q. You can put that one down. 18 A. Mmm-hmm. 19 Q. Find Exhibit 43, please. 20 A. Okay, got it. 21 Q. Now, Exhibit 43 is another memo, and this 22 was from 1983 and it related to a lawsuit, right? 23 A. Yes, that's right. This is the 24 Mr. Ferebee -- 25 Q. Right.	622 1 which is from before. 2 MR. NARESH: I'll mark that as Exhibit 90. 3 (Exhibit 90 marked for identification.) 4 BY MR. NARESH: 5 Q. And I'm just going to look at the first 6 page. First, just familiarize yourself with it. 7 You can look through as much as you'd like. 8 A. Okay. 9 Yeah, okay. 10 Q. Okay. 11 A. Please go ahead. 12 Q. And at the bottom of the first page, 13 there's a box that says "Skin contamination," right? 14 A. That's correct. 15 Q. And it says: 16 "In case of contact, wash immediately with 17 water. Remove clothing and wash skin where necessary. 18 Prolonged contact will cause severe irritation. 19 Repeated contact may increase danger of absorption." 20 Right? 21 A. That's what it says, yes. 22 Q. And so this particular label doesn't say 23 that severe -- that prolonged contact or dermal 24 exposure may be fatal, does it? 25 A. It does not say that --

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623 1 Q. Okay. 2 A. -- no, that's true. 3 Q. And then the label changed, right? 4 A. Okay, yes. 5 MR. NARESH: So let's look at Exhibit 91, 6 which is the label from 1984, so the year after that 7 memo that you were shown, which was marked as 8 Exhibit 43. 9 (Exhibit 91 marked for identification.) 10 BY MR. NARESH: 11 Q. And, again, familiarize yourself with as 12 much of it as you like. I'm going to ask you mainly 13 about the first page. 14 A. Okay, go ahead. 15 Q. And if you'll look at the first page, it 16 says, under the skull and crossbones, it says: 17 "Onset of symptoms may be delayed for up 18 to 3 days." 19 Right? 20 A. It does, yes. 21 Q. And it goes on to say: 22 "May be harmful or fatal if absorbed 23 through the skin or inhaled." 24 Right? 25 A. It does say that, yes.	625 1 "Worker Safety Rules." 2 Do you see that? 3 A. Yes, indeed. Yes. 4 Q. Under that, it has a number of guidelines 5 saying: 6 "Use strictly in accordance with danger 7 statements and directions..." 8 Then it says things like "Do not get on 9 skin," etc., right? 10 A. Yes. 11 Q. And it says -- it gives some guidance for 12 what to do if you're handling the concentrate, mixing 13 it, for example? 14 A. It does, yes. 15 Q. And below that, it says: 16 "Wear waterproof footwear and clothing 17 when spraying or when contacting vegetation wet with 18 spray." 19 A. Yes. 20 Q. And then it also says: 21 "Do not enter treated areas without 22 protective clothing until sprays have dried." 23 Right? 24 A. Yes. 25 Q. And it says:
624 1 Q. And so even if ICI wasn't enthusiastic 2 about the idea of saying that it can be fatal if 3 absorbed through the skin, the label was changed to 4 say that anyway, right? 5 MR. DICKENS: Object to form. 6 THE WITNESS: Indeed. Well, helpful to 7 see that because I had not seen that label before, 8 yeah. 9 BY MR. NARESH: 10 Q. Okay. Now -- well, let me ask it this 11 way: After that memo from 1983, was the label changed 12 to indicate that paraquat could be fatal if absorbed 13 through the skin? 14 A. Well, the evidence I've just been 15 presented with will say yes. 16 Q. Okay. Stick with Exhibit 91 for a moment 17 because you were also asked some questions about PPE 18 and you were asked whether the US label has ever 19 warned about wearing anything other than long-sleeved 20 clothes. 21 Do you remember that question? 22 A. Yes, I do, yes, yes. 23 Q. Let's look at the last page of the label 24 here. 25 There's a section in big, bold text saying	626 1 "Avoid working in spray mist. If there is 2 a risk of exposure, wear goggles and approved face 3 mask capable of filtering spray droplets." 4 Right? 5 A. Yes. 6 Q. And you were also asked -- and I don't 7 know, I can't remember if it was yesterday or today, 8 to be honest -- if the label has ever stated that a 9 filter should be used in a mask. 10 Do you remember that question? 11 A. Yes, I do. Yes. 12 Q. And so I pulled the label as it exists on 13 the website today. 14 (Exhibit 92 marked for identification.) 15 BY MR. NARESH: 16 Q. And I'm handing that to you as Exhibit 92. 17 Again, look as much -- at as much as you'd 18 like, but I'm going to focus on page 3, which is the 19 Precautionary Statements section related to PPE. 20 Right? 21 A. Okay, yes. 22 Q. And in that section, there is some 23 statements about what "applicators and other handlers 24 (other than mixers and loaders) must wear," right? 25 A. Yes, it does say that, yes.

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627 1 Q. And it identifies long-sleeved shirt and 2 pants, shoes and socks, protective eyewear, 3 chemical-resistant gloves. 4 Right? 5 A. Yes. 6 Q. And then below that, it says 7 "NIOSH-approved particulate respirator" with certain 8 kind of filters, right? 9 A. Yes. 10 Q. Okay. You can put the labels to the side. 11 I'd like to shift gears a little bit and 12 ask you about operator exposure studies. You were 13 asked a number of questions both yesterday and today 14 about that. 15 Do you remember that? 16 A. I do, yes. 17 Q. And I'm going to ask about a couple of 18 exhibits that are all in the mid 40s to low 50s, 19 if you'd like to get those ready. 20 I'm going to ask, basically, between 44 21 and 50 for a little while, so you may want to grab all 22 the low ones. 23 A. Okay. I'm ready when you are. 24 Q. Okay. You were shown Exhibit 45, which 25 was an internal memo from 1997, right?	629 1 considered possible that the exposure may be greater 2 if long trousers were worn. 3 Do you remember that? 4 A. Yes, I do now remember that, yes. 5 Q. And it goes on to say: 6 "It was proposed that Zeneca provides a 7 new operator exposure study." 8 Right? 9 A. Okay. 10 Q. And that was in 1997. 11 And so if you would, please, grab 12 Exhibit 46, which was the very next one. It's the 13 big, thick -- 14 A. Yeah, yeah, that's right. I just -- I saw 15 it a minute ago. It seems to have got out of order. 16 There we are, got it. Yeah. 17 Q. Yeah. 18 A. Okay, got it. 19 Q. And just remind the jury, please, what is 20 this document? 21 A. So this is a review of operator exposure 22 studies that was done by Andy Cook and a colleague, 23 Graham Chester, in 2009. It wasn't of every operator 24 exposure study but it was of the more significant 25 ones.
628 1 A. This is the one from Sonia Ellis, yes? 2 Q. Right. 3 A. That right? Mmm-hmm. 4 Q. And it references Andy Cook, right? 5 A. It does. 6 Q. And we've heard his name a fair bit over 7 the last day or two, right? 8 A. Yes. 9 Q. I think you mentioned that you had spoken 10 to him in advance of your prior -- in advance of your 11 prior deposition but you didn't speak to him in 12 advance of your deposition this time, right? 13 A. That's correct, I did not. 14 Q. Why didn't you speak to Mr. Cook this 15 time? 16 A. Well, Andy Cook has now been retired for 17 probably two years or so. 18 Q. Okay. Now, you were asked about the 19 language on the first page under the section called 20 "Operator Exposure." 21 A. Right. 22 Q. And there was a series of questions about 23 whether or not the operator exposure studies 24 represented EU conditions with respect to PPE because 25 most workers wore shorts or a shirt, and it was	630 1 Q. Okay. And then look at -- I'd like to ask 2 you about one particular study -- 3 A. Okay. 4 Q. -- which was -- it's summarized on 5 page 4635. 6 A. Yeah, go ahead. 7 Q. And this is a summary of the Findlay 8 study, right? 9 A. That's right. 10 Q. And you were asked some questions about 11 the Findlay study. 12 A. Yes. 13 Q. You remember that? 14 A. Yes. 15 Q. And what was the year of the Findlay 16 study? 17 A. 1998. 18 Q. So that's one year after that memo that we 19 just looked at, right? 20 A. That's correct. 21 Q. Okay. And in the section entitled 22 Method -- 23 A. Mmm-hmm. 24 Q. -- there's a paragraph, it's the third one 25 down, starting with "Workers wore..."

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631 1 Do you see that? 2 A. Yeah. 3 Q. It says: 4 "Workers wore standardized clothing of 5 long-sleeved cotton shirt, long cotton trousers and 6 rubber boots." 7 Do you see that? 8 A. Yes. 9 Q. And so what does that tell us about 10 whether or not Syngenta, or then Zeneca, did in fact 11 do a worker exposure study at evaluating long-sleeved 12 shirts and pants? 13 A. Well, this suggests that that was exactly 14 the study, yes. 15 Q. Okay. And then you were also asked some 16 questions, I think it was earlier today but it may 17 have been yesterday, about the use of cotton -- 18 A. Mmm. 19 Q. -- as opposed to other substances in PPE. 20 Do you remember that? 21 A. Yes, I do. 22 Q. Okay. And in this study, what was the 23 material for the long-sleeved clothing? 24 A. Both for the shirt and the trousers, it 25 was cotton.	633 1 right? 2 A. Yes. 3 Q. And then in the final sentence of that 4 paragraph, it says: 5 "Paraquat was only detected in the urine 6 of one worker after day 5." 7 Right? 8 A. That's right, yes. 9 Q. And so what does a study like Findlay tell 10 you about the safety of paraquat? 11 A. Well, it says that although we're talking 12 here about cotton clothing, and there were some -- 13 obviously there was some absorption of paraquat, 14 exposure to paraquat, that that was, in the vast 15 majority of cases, eliminated in the urine pretty 16 quickly. 17 Q. Okay. The kidney was doing its job? 18 A. The kidney was doing its job, in other 19 words, yes. 20 Q. Okay. Now, you were also asked some 21 questions about manufacturing worker exposure earlier 22 today. 23 Do you remember that? 24 A. Yeah, I think we may have been getting 25 them mixed together a little bit, yes.
632 1 Q. Okay. And you were asked about one of the 2 findings of Findlay but you weren't asked about some 3 of the others, so I would like to fill in the gaps 4 there. 5 A. Okay. 6 Q. You were asked about the fact that, in 7 Findlay, paraquat was found in the urine samples of 8 18 of the 20 workers, right? 9 A. Yes. 10 Q. Findlay goes on to say what happened to 11 the paraquat in the urine. 12 A. Okay. 13 Q. And if you look at the next page, at the 14 top of it -- so I'm at the top of page 4636. 15 A. Yes, I'm there. 16 Q. It says that: 17 "Paraquat was detected in urine samples of 18 18 of the 20 workers." 19 Right? 20 A. Yes. 21 Q. "No paraquat was detected in any of the 22 urine samples collected prior to exposure." 23 Right? 24 A. Yes. 25 Q. Then it goes on to say what happened,	634 1 Q. Okay. And what does the exposure -- we 2 were going back and forth between -- 3 A. Mmm. 4 Q. -- the manufacturing worker -- 5 A. Mmm. 6 Q. -- and then workers in the fields using -- 7 A. Yeah, we were, yeah. 8 Q. -- paraquat occupationally. 9 (Stenographer interjection.) 10 THE STENOGRAPHER: Thank you. 11 BY MR. NARESH: 12 Q. What does the exposure of a manufacturing 13 worker handling paraquat concentrate on a daily 14 basis -- 15 A. Mmm. 16 Q. -- tell us about a farmer using paraquat 17 occupationally? 18 A. Well, potentially very little because the 19 exposure conditions, especially in the early days of 20 manufacture of paraquat, were significantly higher 21 than would be expected in the vast majority of cases 22 with use of paraquat in the field. And, in any case, 23 in manufacture you're talking about the neat active 24 ingredient, and unless it's mixing and loading in the 25 field, you're talking about spraying a diluted

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635 1 product. 2 Q. Okay. Shift gears a little bit. There 3 have been a lot of acronyms over the last couple of 4 days and two of them that we've talked about are AEOL 5 [sic] and NOEL. 6 A. Okay. 7 Q. Okay. What is an AEOL? 8 A. An AOEL -- 9 Q. A-O-E-L, I'm sorry, yes. 10 A. Right, yes. 11 -- is an Acceptable Operator Exposure 12 Level. 13 Q. What is that? 14 A. Right. So that is derived from a -- the 15 most appropriate toxicity study to assess the risk 16 from an exposure to a particular product, and you take 17 the No Adverse Effect Level in that study, the dose at 18 which no adverse effect was seen in that toxicity 19 study, and you divide that dose by -- usually by a 20 hundred and that gives you the AOEL. 21 Q. Okay. NOEL, what is that? 22 A. Yeah. So that's the No Adverse Effect 23 Level, which is a toxicological parameter. 24 Q. Okay. So what's the difference between an 25 NOEL and an AOEL?	637 1 essentially, so those individuals were not being 2 exposed to a dose that is likely to be acutely toxic. 3 Q. You were asked some questions about Defra. 4 Do you remember that? 5 A. I do, yes. 6 Q. And it's -- you can look at it if you'd 7 like to. I just have a couple of questions. It was 8 Exhibit 44. Feel free to reference it if you'd like. 9 A. Okay. 10 Q. But my first question is: What, if 11 anything, was Syngenta's involvement in conducting 12 this study? 13 A. We had no involvement in the conduct of 14 the study. 15 Q. What was the purpose of the study, as you 16 understand it? 17 A. Defra, which is a UK government department 18 and it includes the regulatory approval for pesticides 19 and the governance thereof, they wanted to see -- they 20 wanted to look at whether it will be possible to do 21 a study on paraquat which would be, in their view, 22 more relevant to the kind of exposures that humans 23 might get to paraquat and as to whether that -- those 24 levels of paraquat may cause the kinds of effects that 25 we've been talking about today seen in mouse studies,
636 1 A. Right. So an NOAEL, even that is a level 2 of, in this case, paraquat that doesn't cause any 3 effects in an animal study, but it is sometimes not 4 that far away from a dose which may cause toxicity 5 because you do a range of doses in a toxicity study. 6 But an AOEL is 100-fold less than even 7 that dose, which does not cause effects in an animal 8 toxicity study. 9 Q. You were asked some questions about the 10 Brouwer study, or Bower study. 11 A. Brouwer, yeah, yeah. 12 Q. And in one of the studies, you were asked 13 about two of the workers for whom the paraquat level 14 exceeded the AOEL. 15 A. Right. 16 Q. First of all, does the Brouwer 17 study/Brouwer study, tell us anything about 18 neurotoxicity? 19 A. No. Absolutely not, no. 20 Q. Okay. And when plaintiffs' counsel asked 21 you about those two particular workers, you made the 22 comment that it didn't exceed the NOEL for any of the 23 workers. 24 A. Yes. So there was -- because that 25 100-fold safety factor is still protected,	638 1 whether you'd see an effect on the substantia nigra in 2 the brain. 3 But very much looking at the -- those -- 4 the human relevance partly through the use of 5 appropriate dose levels. 6 Q. What was the primary outcome of the study? 7 A. It was very interesting, because this was 8 quite a comprehensive study. So they started off with 9 some studies where paraquat was applied to animals 10 using various dosing routes, including the intranasal 11 that we were talking about before, in order to derive 12 a mathematical model, something which, again, we've 13 talked about before now, that could be used to 14 extrapolate from human exposures to the kind -- to the 15 levels of paraquat that would need to be in the brain 16 of those mice in order, potentially, to do damage. 17 So that was -- and what they did, having 18 established that, is to find that in order to achieve 19 a relevant dose level, they -- that would include an 20 extremely low dose level that was relevant to human 21 exposure. We're talking about a thousand-fold or more 22 lower than the kind of concentrations that had been 23 used by other people using that mouse model. 24 But they used that very high dose level as 25 well in the subsequent toxicity study. As well as

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639 1 that very low dose level, there was another dose level 2 which was added to, to be -- to give a more 3 conservative view on human exposure. 4 And taking the totality of that study 5 across that full range of doses, even the top dose, 6 there was no statistically significant effect on the 7 mice in that study. 8 Q. And what did that tell you, from a safety 9 perspective, evaluating the safety of paraquat? 10 A. Well, it told me a number of things. 11 First of all, it continued to tell me that the effect 12 of paraquat on the substantia nigra of the brain of 13 mice is a difficult phenomenon to replicate. So this 14 study also found it difficult to replicate it, as did 15 we. 16 And it also said that you can actually do 17 some pretty clever experiments here to say that even 18 if that had been seen, an effect had been seen, that 19 it was highly unlikely it would be seen at doses which 20 are relevant to those that a human would be exposed 21 to. 22 Q. Okay. I'd like to shift gears and talk 23 about the Malaysia worker studies. 24 A. Okay. 25 Q. And if you would, please, grab Exhibit 49.	641 1 "Of course I'm not against doing more work 2 if it is justified..." 3 A. Mmm-hmm. 4 Q. "... after all, we're just funding a major 5 study in Costa Rica." 6 A. Right. 7 Q. "I am also in favour of using 8 biomonitoring as part of a surveillance strategy where 9 appropriate. But we have done all this in Malaysia 10 already - paraquat stewardship was practically 11 invented there. Can you imagine what will happen if a 12 badly thought-through study generates junk data 13 because a completely unacceptable methodology was 14 used?" 15 A. Right. 16 Q. So what does this tell us about the 17 concerns that were animating Syngenta's desire not to 18 conduct another blood plasma study at this time? 19 A. Right. Because, again, as I said earlier 20 on, that would be -- wouldn't be the optimal way in 21 which you would analyze exposure to paraquat. I mean, 22 there are other reasons also why taking blood samples 23 is not always a good idea, and it says so further down 24 in this email chain. Like it's an invasive procedure 25 and so on.
640 1 I'm going to ask you about 49 and then 50. 2 A. Right, I've got both of those here. 3 Q. Okay. 4 So 49 was this email thread from 2002 5 involving Dr. Wilks and is it Mr. Woollen or -- 6 A. It's Mr. Woollen, yes. 7 Q. Okay. Dr. Wilks and Mr. Woollen. 8 You were asked about, on the first page, 9 the bottom paragraph, becoming -- beginning "More 10 importantly..." 11 Do you see that? 12 A. Yes. 13 Q. And the subject matter of this, just to 14 re-orient everybody, was whether or not to test 15 paraquat in blood plasma in Malaysia, right? 16 A. Right, right. 17 Q. And you were asked about that first 18 sentence and the last sentence but not the middle, so 19 let's talk a little bit about the middle. 20 A. Okay. 21 Q. In the middle, there's a discussion 22 beginning "Of course..." 23 Do you see that? 24 A. Yes. 25 Q. And in it, Dr. Wilks says:	642 1 But, you know, you don't get the right -- 2 best scientific information, more importantly, from 3 looking at plasma levels compared to urine levels. 4 Q. Exhibit 50, please. So this is another 5 thread between Mr. Woollen and Dr. Wilks but it's five 6 years later -- 7 A. Right. 8 Q. -- than the one that we just looked at, 9 right? 10 And this, again, on the subject matter of 11 whether to conduct blood plasma testing of paraquat in 12 Malaysia, right? 13 A. Yes. 14 Q. And if you look at the email from 15 Mr. Woollen to somebody named Teh, T-e-h, right? 16 A. Yes, yes. 17 Q. And there's a third paragraph, beginning 18 "Regarding operator exposure studies..."? 19 A. Yeah. 20 Q. And you were asked about that first 21 sentence but you weren't asked about the rest of the 22 paragraph. 23 A. No. 24 Q. The first sentence says: 25 "Regarding operator exposure studies I

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643 1 would advise you against doing blood sampling." 2 Right? 3 A. It does. 4 Q. But then it goes on to say: 5 "It is an invasive technique. It requires 6 a centrifuge in the field and once the samples are 7 collected, there are handling problems for staff 8 because of potential risks of HIV..." 9 A. Mmm. 10 Q. "... Hep B, etc. Also the results are 11 much more difficult to interpret than urine since the 12 sample is just a snapshot." 13 And what does this tell us about the 14 concerns that were animating Syngenta's desire not to 15 conduct a blood plasma study at this time? 16 A. Right, so it's on the same theme, and 17 I think I did very briefly mention yesterday when we 18 were talking about this, that that issue of it being 19 a snapshot, you know, a single point in time, it's not 20 the way in which you get the best scientific answer to 21 how much exposure there's been to paraquat. 22 So that was still a prime reason for 23 saying urine is the better option, and then there were 24 some other reasons about the biological hazards of 25 blood.	645 1 bring people up to date with some technical issues, 2 and that was the case here. 3 Q. Why did you want to give them guidelines 4 of what they should not be saying to regulators? 5 A. Because it's important that they don't 6 make claims that are not -- that cannot be 7 substantiated so the science doesn't back up. 8 Q. Let me shift gears a little bit and ask 9 about surfactants, and specifically I'd like to ask 10 you about the study that was discussed yesterday, 11 about Agral 90. 12 A. Mmm-hmm. 13 Q. Do you remember that? 14 A. Mmm-hmm. 15 Q. It's Exhibit 24, if you're able to find 16 that. 17 A. Yeah, got it. 18 Q. All right. So let's just walk through 19 a couple questions. This was a rat inhalation study? 20 A. Yes, that's right. 21 Q. All right. Look at page 3, please, where 22 it discusses the study design. 23 A. Okay. 24 Q. And the third sentence, which begins at 25 the very end of the third line --
644 1 Q. All right. Let's shift gears. Very 2 briefly, I'd like to ask you about Exhibits 66 and 67. 3 All right. 4 A. All right. 5 Q. Do you have those in front of you? 6 A. Yes, I do. 7 Q. And this was the email thread and 8 attachment from 2007, "Parkinson's Disease: What can 9 Syngenta say about the issue?" 10 Right? 11 A. Right, yes, the slide set on 67, yes. 12 Q. And you were shown the third page of the 13 slide, saying "What we cannot say," right? 14 A. Yes, that's right. 15 Q. You went through a couple of the things 16 that cannot be said about the issue. 17 My question is, first, the regulatory 18 training: What's the point of regulatory training 19 like the ones being -- like the training being 20 reflected in this document? 21 A. Well, whenever people -- particularly when 22 people are new to the regulatory department or even 23 people who have been in regulatory for a while, 24 training is sometimes on general issues about how to 25 interact with regulatory authorities. They're also to	646 1 A. Yes. 2 Q. -- says: 3 "Any small droplets released by the spray 4 head were drawn past the rats which were housed on an 5 open mesh unit and restrained in polycarbonate tubes 6 to facilitate nose-only exposure and to minimize pelt 7 contamination." 8 A. Yes. 9 Q. Just to help the jury understand, when the 10 rats were being exposed to this, were they able to 11 move or turn their head away from the formulation 12 being sprayed in their faces? 13 A. No, this is the nose-only method of 14 application, so the animals are restrained. 15 Q. And so while the animals are being exposed 16 in this way, how long are they being exposed to that? 17 A. Well, usually this would be four hours or 18 so. 19 Q. Okay. And if you look down at the bottom 20 of that paragraph, it even says that the exposure 21 period was of four hours' duration, right? 22 A. Right. 23 Q. And so for four hours straight, rats were 24 being held steady and paraquat with Agral was being 25 sprayed directly in their face?

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647 1 A. Yeah, that's an accurate way of describing 2 it. 3 Q. How does that compare to what happens to 4 farmers in their fields and orchards? 5 A. Well, as with many toxicology tests, it's 6 clearly an exaggerated exposure. It's not only the 7 time but also the fact that the animal had no 8 alternative other than to continuously breathe in that 9 paraquat-containing atmosphere for that full four-hour 10 period, not something that would be happening to 11 a sprayer in the field. 12 Q. Now, you also were asked some questions 13 about what happened, and there were -- how many rats 14 were studied in this? 15 A. So five male and five female altogether. 16 Q. Okay. And of the ten, one died 17 unexpectedly, right? 18 A. Yeah, that's what we were discussing 19 yesterday, I think, wasn't it? 20 Q. Now, in toxicological studies like this, 21 what are the potential explanations for an unexpected 22 death? 23 A. There are a variety. Sometimes it can be 24 just simply the stress caused to the animal, because 25 in these kind of conditions of restraint, an animal	649 1 minutes -- 2 A. Yeah. 3 Q. -- from July of '21, right? 4 A. Got it. 5 Q. And there's -- and you were asked about 6 this yesterday, right? 7 A. Yes, I was. 8 Q. And in the second paragraph, it says: 9 "The view of Product Safety is that the 10 findings in this study..." 11 And that's discussing the study we just 12 talked about, right? 13 A. Mmm. 14 Q. "... the findings of this study do not 15 alter the company position, given that there have been 16 no reports of toxicity by the inhalation route 17 following normal use." 18 A. Yes. 19 Q. Right? 20 And then it goes on in the next paragraph 21 to say: 22 "It does not appear that the findings meet 23 the criteria for submission as a PRF, given that the 24 single mortality at one exposure concentration of 25 0.15 micrograms per liter does not alter the existing
648 1 can become distressed, that they may become sick and 2 can even -- could even die. 3 And there are a variety of other 4 conditions, but you would also include the fact that 5 when you're giving a -- getting them to breathe in an 6 atmosphere containing a chemical, that, actually, it's 7 just that foreign atmosphere, if you like, that causes 8 some nonspecific toxicities, not directly related to 9 the chemical and, therefore, the animal could get sick 10 or could even die. 11 Q. Does this study articulate any concerns 12 about neurotoxicity or Parkinson's disease? 13 A. No, no, not at all. 14 Q. Were any neurotoxic symptoms reported at 15 all? 16 A. No, no, not at all. 17 Q. And as for the other nine animals in the 18 study, does Exhibit 24 say what happened to them? 19 A. It said they all survived. They gained 20 weight by day 8, all animals had exceeded their 21 starting weight and there were no treatment-related 22 findings postmortem. 23 Q. Now find Exhibit 27, please. 24 A. Okay, got it. 25 Q. This was the RAD strategy meeting	650 1 classification of this formulation." 2 A. Yeah. 3 Q. So in plain English, what's going on here? 4 A. Okay. So I was still questioning in my 5 mind yesterday exactly who was involved in this 6 meeting and whether, in fact, it was a meeting of 7 people in the United States or in Europe. I think, 8 with further thought, it looks like this is a meeting 9 in the United States, so it would be, as we were 10 discussing yesterday, the US PRF committee looking to 11 see whether that finding, which had been referred by 12 the Approach Committee based at CTL as potentially 13 referable, whether it really was referable. 14 And there is some Product Safety input to 15 those USA discussions, as this indicates. And because 16 this committee has got experience of what the EPA does 17 with this information, they said that this finding of 18 a single mortality would not, in any way, change the 19 EPA's assessment of the risk to paraquat. 20 Q. Okay. You can put that one down. Let's 21 look at Exhibit 64, please. 22 A. 64? 23 Q. 64, yes. 24 A. Got it. 25 Q. This was the April 10, 2001 Gramoxone PLT

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651 1 PowerPoint that you were shown earlier? 2 A. Yeah. 3 Q. And there were a couple of pages that were 4 shown to you. I'd like to ask you about some of the 5 things you were not asked about. 6 If you look at page 5, so it's ending 7797 7 in the Bates. 8 A. Yes. 9 Q. You were asked about the second bullet, 10 about Parkinsonism being the issue of the day, so let 11 me ask you about the first bullet. 12 A. Yes. 13 Q. And the first bullet says: 14 "We are being vigilant in taking the 15 potential impact on Gramoxone seriously." 16 So what does that tell you about what was 17 going on with Syngenta's research program in 2001? 18 A. Right. Yeah, so 2001, when further 19 information was coming out into the public domain, 20 that there was potentially a link between paraquat and 21 Parkinson's disease, we wanted to make sure that we 22 understood what that information was saying, so we 23 would want to go to, for example, experimental 24 meetings, toxicology meetings where that was being 25 described. And the SOT is the Society of Toxicology	653 1 humans are subjected to to pesticides in order for the 2 science -- the interpretation of the science not to be 3 exaggerated. 4 Q. I'm going to shift gears a little bit. 5 Over the course of yesterday and today, there 6 have been a number of questions about whether Syngenta 7 values profit and whether Syngenta was designing 8 studies to avoid Potentially Referable Findings. 9 Do you remember that? 10 A. I do, yeah. 11 Q. And at one point you said creating 12 a reportable finding might be an element but it was 13 not the only element. 14 Do you remember that testimony? 15 A. I do remember saying that, yes. 16 Q. As the former head of Product Safety, what 17 is the most important element for Syngenta when it 18 comes to deciding whether to do or not to do a study? 19 A. Well, it's -- as the head -- former head 20 of Product Safety, as you rightly say, and still for 21 me today even in my current role, the most important 22 thing is to actually make sure that any science that 23 is applied to either the safety of humans or the 24 environment is the best-quality science that we can 25 either do ourselves or get access to from
652 1 in the United States, so attending that meeting. 2 And then as we discussed yesterday also, 3 a meeting in Colorado. 4 So we were taking it very seriously. 5 Q. The next slide, slide 6, ending in 7798, 6 let me ask you about the first bullet there which you 7 were not asked about. 8 A. Mmm-hmm. 9 Q. "Presentations are essentially based on 10 good science but lack perspective on pesticide 11 exposure..." 12 A. Right. 13 Q. "... and therefore emotive for the 14 industry." 15 Help the jury understand what's being 16 discussed there, please. 17 A. Right. So, yes, this, again, is 18 consistent with I think what I've been saying, that, 19 you know, we were not saying that what other people 20 were doing was always bad science. We appreciated 21 that people were doing some good science, but it was 22 important for us, and potentially those researchers 23 also, to understand the relevance of that good science 24 to actual human risk, and that part of that is 25 actually to understand, therefore, the exposure that	654 1 collaborators or elsewhere. 2 So science for accurate risk assessment is 3 the key to what we do. 4 Q. Okay. And you were asked questions 5 earlier today about communications with farmers other 6 than the label. 7 A. Okay. 8 Q. And you were also shown a pamphlet from, 9 I think it was represented it was the mid-1980s or so. 10 A. Mmm. 11 Q. One of the questions you received was if 12 Syngenta had ever indicated to farmers and the public 13 that there was evidence of the paraquat/Parkinson's 14 hypothesis -- 15 A. Okay. 16 Q. -- and if Syngenta had ever told farmers, 17 "This hypothesis exists; we just don't agree with it," 18 right, and you couldn't remember. 19 A. Right. 20 Q. And then, later, you were asked some 21 questions about paraquat.com. 22 A. Yes, that's right. 23 Q. What is paraquat.com? 24 A. Right. So there was a specific website 25 which was set up by us to do exactly what you said, to

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655 1 talk about paraquat, what it does, why it does it, and 2 what are the things that we need to know about 3 paraquat, including its safety. That -- it still 4 exists but, actually, now, you know, it's incorporated 5 into the general Syngenta website, but that was its 6 purpose for quite a long time. 7 Q. And it was a website, so was it updated 8 over time? 9 A. It was regularly updated, yes. 10 Q. Okay. And so I'm going to hand you one 11 that was almost ironically previously marked as 12 Exhibit 94 in one of your earlier depositions. Now 13 I'm going to mark it 93. So it's not your first time 14 dealing with this many documents. 15 (Exhibit 93 marked for identification.) 16 BY MR. NARESH: 17 Q. But does this look like an extract from 18 paraquat.com from around 2016 or so? 19 A. Just give me a second. 20 Okay. Right. So, yeah, the most recent 21 publication seems to be 2016. So, absolutely, yeah, 22 this is from the Paraquat Information Center, the 23 website we've been talking about, and 2016 looks like 24 a reasonable guess on when it was from. 25 Q. And I recognize it was probably -- there	657 1 A. Yes, that's right. 2 Q. And then it goes on to explain how 3 Syngenta interprets those animal studies -- 4 A. Yes. 5 Q. -- right? 6 And then it goes on on the next page, 7 page 3, to discuss epidemiology studies, right? 8 A. Yes. 9 Q. And it discusses, for example, the Kamel 10 study from 2007 on page 4? 11 A. Right. 12 Q. And then it goes on, on page 5, to discuss 13 the Tanner study, right? 14 A. Yes. 15 Q. And these were studies that reported on 16 a potential link between paraquat and Parkinson's 17 disease? 18 A. That's right, and the ones we've just been 19 talking about are from the agricultural health study 20 that we've been talking about today. 21 Q. And then you go on to identify Syngenta's 22 own position with respect to those studies and other 23 select studies from the literature, right? 24 A. Sure, yes. 25 Q. And was this attempting to canvas all,
656 1 were some differences before and there are some 2 differences after because that's how websites work, 3 right? 4 A. Yeah, yeah. Yeah, yeah. 5 Q. Okay. And in this particular version that 6 existed at that time, there's a section called 7 "Paraquat and Parkinson's disease." 8 Right? 9 A. There is, yes. 10 Q. And in the introduction, it first explains 11 what Parkinson's disease is, right? 12 A. Yeah. 13 Q. And then it goes on to explain that in the 14 1980s, the paraquat/Parkinson's hypothesis was born 15 because of the experience with MPTP, right? 16 A. Yes, that's right. 17 Q. And to be clear, is MPTP paraquat? 18 A. No, it's not. 19 Q. Okay. And then it goes on to discuss 20 animal studies, right? 21 A. Yes. 22 Q. And it explains that there are some animal 23 studies finding that paraquat injections have led to 24 the loss of dopaminergic neurons in the SNpc, at the 25 top of page 2, right?	658 1 what are the 1200 studies that Syngenta has done? 2 A. No, not at all. 3 Q. No? 4 A. No, this was focused on Parkinson's. 5 Q. And does this identify that Syngenta did 6 disclose the existence of the paraquat/Parkinson's 7 hypothesis? 8 A. Yes, absolutely. This is -- we've always 9 been very open about that, as now illustrating on our 10 website, but through our publications. So some of 11 those have been referenced in here as well. Through 12 our interaction with other scientists. Many ways in 13 which we have been open. 14 Q. And does this explain that Syngenta 15 disagreed with that hypothesis? 16 A. It said that we wanted to investigate that 17 hypothesis, so we didn't start with a premise 18 "We disagree with it." We said, "Okay, there's a 19 plausible hypothesis. Let's start to see what the 20 evidence really tells us." 21 Q. Now, and, Dr. Botham, if Syngenta were 22 presented now or had been presented with reliable 23 scientific evidence, whether generated by Syngenta or 24 outsiders, that there's a substantial risk that 25 paraquat causes Parkinson's disease, what would

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659 1 Syngenta do with respect to paraquat? 2 A. If that was tipping the weight of the 3 evidence to say that there was more likelihood of 4 a causative link, then, you know, we have got a duty 5 of care, initially as a product safety organization 6 but then as a company, to say we should not be selling 7 paraquat. 8 MR. NARESH: I have no further questions 9 at this time. 10 MR. DICKENS: I will have follow-up. If 11 I can have five minutes to get these documents in 12 order -- 13 MR. NARESH: Yeah. 14 MR. DICKENS: -- I'll be ready to go. 15 THE VIDEOGRAPHER: We are going off the 16 record at 17:21. 17 (Break taken.) 18 THE VIDEOGRAPHER: We are back on the 19 record at 17:30. 20 FURTHER EXAMINATION ON BEHALF OF PLAINTIFFS 21 BY MR. DICKENS: 22 Q. Dr. Botham, I do have some follow-up 23 questions with respect to the questions you were just 24 asked by counsel for Syngenta. 25 If we can start with Exhibit 4, which is	661 1 A. Well, I think he probably had enough 2 experience to determine that anoxia was the kind of 3 thing that -- or that would be responsible for that 4 because of the profound effect on the lungs. 5 Q. For the degenerative changes? 6 A. For any degenerative changes, in 7 particular to the brain, which is dependent on having 8 high levels of oxygen. 9 Q. Okay. 10 Now, you testified that the ingestion of 11 paraquat would be far different from an exposure 12 standpoint as someone who was spraying in the field, 13 correct? 14 A. Right. 15 Q. That oral ingestion, the drinking of the 16 paraquat, would far exceed any dermal absorption that 17 would be experienced, right? 18 A. As a general statement, yes. 19 Q. Okay. And in the Defra study, they did 20 provide calculations with respect to how much paraquat 21 reached the brain from oral, IP, intranasal and dermal 22 exposure, correct? 23 A. They did, yes. 24 Q. And what they found in the Defra study is 25 that oral ingestion of paraquat actually resulted in
660 1 the autopsy of the farm worker, correct? 2 A. Okay. I think my counsel is going to make 3 sure that I get quick access to these documents, 4 thank you. 5 Q. And so you were shown a section where the 6 coroner notes that there was anoxia, right? 7 A. Yes. 8 Q. And made a determination that that 9 probably led to the degenerative changes in the brain, 10 correct? 11 A. Yes, yes. 12 Q. Now, at this -- what was the date of this 13 particular autopsy? 14 A. The 10th of the 5th 1976. 15 Q. And you'd agree that in 1976, it's 16 unlikely that this coroner would have been aware of 17 the fact that paraquat had any effect whatsoever or 18 had been shown in animal studies or elsewhere to have 19 effect in the brain, correct? 20 A. It's very likely that he would not have 21 known that, yes. 22 Q. So it's unlikely that he would have 23 attributed any degenerative changes in the 24 substantia nigra to paraquat if he was unaware of any 25 of those studies or results, correct?	662 1 the least amount of paraquat reaching the brain, 2 correct? 3 A. That's right, but it doesn't mean that it 4 doesn't -- it isn't potentially getting there, that's 5 true. 6 Q. Okay. So out of all of the different 7 methods of exposure within Defra, the least amount was 8 from the oral ingestion of the paraquat to those mice 9 in that particular study, right? 10 A. Okay. 11 Q. Is that right? 12 A. Well, that's what the data show. 13 Q. Okay. You mentioned for IBT that you were 14 shown a document and it was suggested that Syngenta 15 conducted all of those studies again, correct? 16 A. It certainly conducted some of those 17 studies again. 18 Q. Didn't conduct all of them, did they? 19 A. I know that it conducted some of them. 20 Those are the ones that I've got evidence for in front 21 of me. 22 Q. They did not conduct the neurotoxicity 23 study, did they? 24 A. I still don't know what that neurotoxicity 25 study was in the first place, what it covered.

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663 1 Q. So you weren't able to figure out what the 2 neurotoxicity study was? 3 A. No. I mean, given the time that we're 4 talking about, I've got -- such a study would not 5 normally have been a required study, so I do not know 6 what that neurotoxicity study evaluated. 7 Q. And you agree that Syngenta did not 8 conduct all of the studies that were conducted by IBT 9 at the time of registration, correct? 10 A. It certainly repeated the really key 11 studies, such as the long-term studies, the chronic 12 studies in the rat and the mouse, and the longer-term 13 study in the dog. 14 Q. Do you know whether or not they conducted 15 the two inhalation studies conducted by IBT that are 16 referenced in your Exhibit 1? 17 A. Well, what I know is that there were 18 certainly a number of inhalation studies conducted 19 after the IBT studies were done, so a series of acute 20 inhalation studies were conducted. 21 Q. But were they done in the -- was the 22 subacute aerosol inhalation toxicity of paraquat 23 redone and resubmitted in the 1980s at the time? 24 A. Well, that, I don't know, that's -- 25 a subacute would normally mean a 28-day inhalation	665 1 BY MR. DICKENS: 2 Q. And that's because of the alginate, 3 correct? 4 A. That was probably one reason, yes, that 5 the alginate would form a barrier. 6 Q. So dermal absorption with Inteon would be 7 substantially less than what it would be on the 8 formulation that was on the market beforehand? 9 MR. NARESH: Form. 10 THE WITNESS: It would be less. I don't 11 know -- I would need some quantification figures to 12 hand to determine if it was substantial or not. 13 BY MR. DICKENS: 14 Q. And you'd agree that reduced dermal 15 absorption does -- is relevant to chronic toxicity, 16 correct? 17 A. I don't know why that would be more 18 relevant to chronic toxicity than oral exposure. 19 Q. Well, I'm not asking about whether it's 20 more, but you had mentioned that Inteon had nothing to 21 do with chronic toxicity, I believe was your 22 testimony, right? 23 A. It has got nothing to do with chronic 24 toxicity. 25 Q. Okay.
664 1 study and we've talked about that today -- 2 (Stenographer interjection.) 3 THE WITNESS: A subacute study would 4 normally mean something like a 28-day study, rather 5 like we were discussing earlier today. I don't know 6 that I've got any evidence that that study was done. 7 BY MR. DICKENS: 8 Q. And that was the study that Syngenta 9 specifically said, "We will not conduct this study," 10 right? 11 A. That we didn't -- 12 MR. NARESH: Objection to form. 13 THE WITNESS: Yeah. That we didn't need 14 to do, yes. 15 BY MR. DICKENS: 16 Q. You, in discussion about Inteon, mentioned 17 that Inteon was concerned with acute toxicity, was 18 your testimony, right? 19 A. That's correct. 20 Q. Now, Inteon was also represented to the 21 regulatory agencies and users of paraquat as greatly 22 reducing the amount of dermal absorption, correct? 23 MR. NARESH: Objection to form. 24 THE WITNESS: The Inteon was not as 25 readily able to cross the skin.	666 1 A. We never made any claims that it altered 2 the chronic toxicity of paraquat. 3 Q. Okay. You did make claims that it would 4 reduce dermal absorption? 5 MR. NARESH: Asked and answered. 6 THE WITNESS: Yes, the dermal absorption 7 is lower from Inteon than a non-Inteon paraquat. 8 BY MR. DICKENS: 9 Q. And prolonged dermal absorption would be 10 relevant if paraquat was related to chronic illnesses; 11 you'd agree with that? 12 MR. NARESH: Form. 13 THE WITNESS: It would have to be very 14 prolonged. I think when we're talking about chronic 15 illnesses, and that's not just Parkinson's but also 16 things like cancer, you would normally say that that 17 would be something that would occur after, you know, 18 long periods of times of exposure, not the kind of 19 dermal exposures in this case that we're talking about 20 here. 21 BY MR. DICKENS: 22 Q. If less paraquat gets through the skin, 23 less gets into the brain; you'd agree with that? 24 A. Well, clearly, that's self-evident. 25 Q. You mentioned, when talking about the

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667 1 Defra study and its results, Defra found a decrease of 2 17 percent and 20 percent in TH-positive neurons in 3 the substantia nigra for high- and mid-dose male 4 mouse? 5 A. I didn't mention that, but that is what 6 the report says. But the report says that those 7 findings are not statistically significant. 8 Q. And what they found and instructed was 9 that additional studies should be taken in order to 10 make firm determinations as to what the implications 11 of those dose levels were, correct? 12 MR. NARESH: And, Dr. Botham, if you'd 13 like a copy of the document, I'm happy to supply it. 14 THE WITNESS: Yeah. 15 MR. NARESH: Can you give me 4 back just 16 so we stay organized? 17 THE WITNESS: Sorry? 18 MR. NARESH: Hand me that one right there. 19 I'm going to keep my set... 20 THE WITNESS: Oh, yeah, that's right. 21 MR. NARESH: There you go. 22 THE WITNESS: Thank you. 23 BY MR. DICKENS: 24 Q. Okay. If I can direct your attention to 25 page 13.	669 1 order to investigate based on the findings in this 2 particular study, correct? 3 A. Yes. 4 Q. The very last sentence: 5 "It will be important to repeat the 6 in vivo study with 16-month-old males to determine if 7 the reduced number of TH-positive neurons at the 8 middle dose level is consistent. If so, there are 9 implications at dose levels that are at the top range 10 of human relevant doses." 11 And that's -- Syngenta was aware of this 12 at the time that this Defra study was finalized, 13 correct? 14 A. Well, yes. To be clear, this report, the 15 final version of this report was never officially 16 published. We were eventually able to get a copy of 17 it, so, yes, we were aware of it. 18 Q. Okay. And has Syngenta undertaken any 19 efforts to repeat the in vivo study with 16-month-old 20 males? 21 A. No, not 16-month-old animals. We've not 22 done animals as old as that. 23 Q. Has Syngenta undertaken any studies in 24 response to the recommendations from the Defra authors 25 after receiving a copy of this finalized report?
668 1 A. Yes. 2 Q. And in the second paragraph for Study 2, 3 in vivo mouse study, it states: 4 "The major findings of this study are 5 related to the observed mortality in high dose males 6 during adult dosing, and a decrease of 17%, 20%, in 7 TH-positive neurons of the substantia nigra in high 8 and mid dose males, respectively, that had been 9 treated both as pups and as adults, and sacrificed 10 at 16 months of age." 11 That's the significant finding in the 12 in vivo mouse study, right? 13 A. Right. But you've failed to recognize 14 that they also said in this report that 20 percent and 15 17 percent did not achieve statistical significance. 16 Q. Okay. 17 A. Because -- and we all -- anybody who's 18 been involved in this area of research knows that you 19 get very high confidence intervals when you're 20 measuring TH-positive cells. 21 Q. Okay. And then there's possibilities for 22 further work, right? 23 A. Right. 24 Q. And they actually give some 25 recommendations for further work that could be done in	670 1 A. What we said about this study is that it 2 adds to our own findings that this model, the mouse 3 model, is not a robust model. You can do a study 4 again, we could have done a study again, and it -- we 5 know that -- and our collaboration with Dr. Smeyne 6 confirmed this, that even somebody like Dr. Smeyne, 7 who had previously seen an effect in the 8 substantia nigra, was not able to see the effect when 9 it was repeated. 10 Q. The authors of Defra certainly didn't 11 conclude that the mouse model was not robust, correct? 12 A. That's certainly not what they wrote here, 13 but I think the report itself says that it adds to 14 that weight of evidence of lack of robustness. 15 Q. You were asked questions with respect to 16 the intranasal study and you indicated that people 17 believe that there's a possible route from the 18 olfactory bulb to the brain, right? 19 A. Well, it's known that there is a 20 possibility of that. 21 Q. And Syngenta agrees with that. We saw the 22 emails -- 23 A. Yes. 24 Q. -- suggesting it. 25 If you can bring up Exhibit 49 --

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671 1 MR. NARESH: See, now mine are out of 2 order. 3 MR. DICKENS: -- which is -- 4 MR. NARESH: Is that one that we looked 5 at -- 6 MR. DICKENS: -- an email from a Martin 7 Wilks. 8 THE WITNESS: Competition here to see who 9 can find it first. 10 MR. NARESH: I'm at 47. 11 THE WITNESS: I've got it. I've got it. 12 Yeah, I've got it, 49. 13 BY MR. DICKENS: 14 Q. Okay. And specifically was looking at the 15 email from Martin Wilks at the bottom of the page, 16 correct? 17 A. Okay, yes. 18 Q. And you were directed to some of the 19 information in the middle of the last paragraph on 20 that page, right? 21 A. That's correct. 22 Q. And it is some statements with respect to 23 why plasma monitoring should not be included in 24 biomonitoring, right? 25 A. Yes.	673 1 issues, those were also practicality and safety issues 2 at the time that Syngenta elected to undergo plasma 3 testing in their own studies, right? 4 A. Of course, yes. 5 Q. Yet Syngenta itself decided it should move 6 forward with plasma monitoring, right? 7 A. In some studies, but the majority of the 8 studies that we were involved in said that urinary 9 excretion levels of paraquat were likely to be the 10 better measurement of exposure. 11 Q. Now, the experts that Syngenta retained to 12 do the PBPK modeling in 2014, those experts found that 13 the plasma calculations were important enough to 14 include in their PBPK modeling, right? 15 A. And that's because they're being used for 16 a totally different purpose. They're trying to -- the 17 word is "parameterize" the mathematical model to make 18 sure that the mathematical model is likely to be 19 representative of what's happening in real life. 20 Q. I'm going to ask you questions about 21 Exhibit 27, which is the RAD strategy meeting minutes. 22 A. Thank you. 23 Q. Now, you indicated that, after yesterday, 24 you now believe that this was a meeting in the United 25 States, right?
672 1 Q. Now, at this time, Martin Wilks knew 2 nothing about the study design, right? 3 MR. NARESH: Objection to form, 4 foundation. 5 THE WITNESS: I don't know what Martin 6 Wilks knew precisely at this time. 7 BY MR. DICKENS: 8 Q. He didn't know how it would be done, what 9 would be included, anything whatsoever to know that 10 this would not be an appropriate study in order to 11 test biomonitoring or exposure in operators, right? 12 MR. NARESH: Same objections. 13 THE WITNESS: Well, he had been copied 14 into the email that's before this, 1 August, which was 15 talking about elements of the study design, so I guess 16 I have to disagree with you; he was aware of what was 17 being proposed. 18 BY MR. DICKENS: 19 Q. And his only concern was the plasma 20 monitoring within this biomonitoring study as an issue 21 with respect to study design, right? 22 A. Both from a scientific robustness 23 perspective and some of the practicalities and safety 24 issues. 25 Q. Okay. And those practicality and safety	674 1 A. Yeah, I'm more inclined to think it was a 2 USA meeting, yes. 3 Q. Okay. Did you go back to review any 4 documents in order to determine that this was a 5 meeting in the United States? 6 A. No, actually, to be quite open, I did 7 discuss with my colleagues here today and they thought 8 that was also -- they also thought that was most 9 likely. 10 Q. Now, RAD, that's a different committee 11 than the 6(A)(2) committee that was in place in the 12 United States, correct? 13 A. Well, that was one of my questions. 14 But whatever it was called, it's clear from this, the 15 way this is written, now that we've ascertained this 16 was very likely to be the United States, that that was 17 fulfilling the same purpose as the PRF committee. 18 Q. Okay. And when you say "the PRF," you 19 mean the one in the United States? 20 A. Yes, yes. 21 Q. And you, in fact, have received and 22 reviewed United States PRF meeting minutes when they 23 consider whether or not to submit something to the 24 United States, right? 25 A. Yes.

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675 1 Q. And they actually keep minutes that detail 2 what they're determining and what their decision is? 3 A. Correct. 4 Q. This document before you is not the 5 typical way in which a PRF would be considered in the 6 United States, right? 7 A. Well, this is -- the content of this is 8 very much the kind of content that I would have 9 expected to see from the US PRF Committee that 10 I became more familiar with. So that's why I think it 11 was doing -- fulfilling the same purpose. 12 Q. But it was certainly not handled in the 13 same way; you can agree on that? 14 A. I think it was handled in a very similar 15 way by a group of people who happened to call 16 themselves a different -- RAD strategy meeting. 17 Q. In the typical meeting minutes for the US 18 PRF committee, it would give a list of attendees, 19 right? 20 A. Yes. 21 Q. It would give -- and there's a specified 22 form for those minutes that is typically used? 23 A. Yes. 24 Q. Have you seen a PRF form like that with 25 respect to this particular study?	677 1 whether or not it would change the EPA's decision 2 would be the EPA, right? 3 A. Well, the committee that I'm talking about 4 had come to that conclusion through long experience of 5 submitting to and even having discussions with the 6 US EPA. 7 Q. But that PRF Committee, we don't know if 8 they were the ones who actually made this decision; is 9 that fair? 10 A. Which? Sorry, which? 11 Q. They're the ones who actually made the 12 determination? Because we don't know who was actually 13 in attendance, right? 14 A. Well, we don't -- I don't have names in 15 front of me, no. 16 Q. Now, the study that this was referring to 17 was that study with Agral, correct? 18 A. That's right. 19 Q. And you were asked some questions and 20 I believe your testimony was, essentially, this was 21 far different than what individuals in the field would 22 experience, right? 23 A. Of course, yes. 24 Q. However, this study was specifically 25 designed so that the rats would be exposed "in a
676 1 A. No, I have not. 2 Q. The PRF Committee that you were on 3 determined that the death in the particular study was 4 treatment related, right? 5 A. Yes. And you remember I did say yesterday 6 that the Approach Committee, which is the one that 7 I attend and you're just referring to, was always very 8 precautionary. So there was some discussion about 9 whether the effects seen in that animal were related 10 to treatment, whether it related to paraquat, and we 11 decided that whilst it was probably not the case, 12 nevertheless we should actually suggest to the US PRF 13 committee that they also review this. 14 Q. Whoever was in this meeting determined 15 that, I believe you said, it would not change the 16 EPA's decision, right? 17 A. That's right, and that's one of the 18 expertises that the USA PRF Committee had which we 19 only indirectly have had on the Approach Committee. 20 So they knew what the EPA were really looking for when 21 receiving Potentially Referable Findings and, again, 22 to generalize, it would be information that would 23 change the assessment of the risk from a substance by 24 the EPA. 25 Q. You'd agree that the better determiner of	678 1 manner designed to stimulate exposure by those in the 2 field," correct? 3 A. Well, that's what it says, but it's 4 exaggerated exposure of what people might be exposed 5 to in the field; so it's not -- people in the field 6 would not have a mask over their nose with a paraquat 7 formulation being sprayed through that mask for four 8 hours. 9 Q. Syngenta designed this study? 10 A. Yes. 11 Q. And designed it in the best way that they 12 knew to test animals in order to stimulate -- or to 13 simulate exposure of those in the field by inhalation 14 or intranasal, right? 15 A. Exactly, but it was still an exaggerated 16 exposure. 17 Q. And Syngenta never undertook efforts to 18 redo that study to see if those results or the death 19 in that case was treatment related, correct? 20 A. That's right. 21 Q. I want you to look at Exhibit 93, which is 22 the paraquat.com printout. 23 A. Yes. 24 Q. The bottom of page 1 is the animal 25 studies.

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679 1 A. Yes. 2 Q. And it notes the major research program, 3 and then it says: 4 "The research work has been, and will 5 continue to be, published in peer-reviewed scientific 6 journals and the results communicated to relevant 7 regulatory agencies." 8 Right? 9 A. Yes. 10 Q. And it says that suggests that the 11 research work always has been either published or 12 submitted to regulatory agencies, right? 13 MR. NARESH: Objection; form. 14 THE WITNESS: That is what we said, yes. 15 BY MR. DICKENS: 16 Q. Okay. And you testified at length in your 17 previous depositions with respect to the Marks 18 studies, right? 19 A. Indeed. 20 Q. Those Marks studies were not initially 21 submitted to the EPA, were they? 22 A. Not as Potentially Referable Findings, no. 23 Q. Not at all until an attorney suggested 24 that they should be submitted? 25 MR. NARESH: Objection;	681 1 Q. And then there were other Marks studies 2 that were submitted at a later date? 3 A. Later on, yes. 4 Q. Okay. And those "later date," that was 5 after 2016? 6 A. Yes. 7 Q. Okay. So after this statement on the 8 paraquat.com website, right? 9 A. That's right, yes. 10 Q. So it's safe to say that the research work 11 was not always either published and peer-reviewed in 12 scientific journals or communicated to relevant 13 regulatory agencies, right? 14 A. The vast majority of the work that we did 15 was made available publicly through the publications 16 and through things like the Paraquat Information 17 Center. 18 Q. And the Marks studies, were those ever 19 published? 20 A. No, they were not. 21 Q. Do you need EPA approval in order to make 22 changes to the paraquat.com website? 23 A. No. 24 Q. Now, you were shown some labels for 25 various periods of time, correct?
680 1 mischaracterizes -- 2 THE WITNESS: Yeah -- 3 MR. NARESH: -- lots of things. 4 THE WITNESS: -- it was suggested, but 5 much later, during a previous deposition to this, or 6 trial -- potential trial to this, that it might be 7 prudent to let the EPA see those studies. 8 They did receive them. The EPA said 9 thank you. We didn't really need to see them because, 10 as I said earlier, they had no bearing on our 11 understanding of the risk from paraquat. 12 BY MR. DICKENS: 13 Q. When were they submitted to the EPA, if 14 you can recall? 15 A. I think that was 20 -- 16 MR. NARESH: Can we -- it's compound. If 17 you're going to do that question, I think you have to 18 break it down on each of the Marks studies. 19 MR. DICKENS: Okay. 20 MR. NARESH: Because there isn't a single 21 author, obviously. 22 BY MR. DICKENS: 23 Q. There was one Marks study that was 24 submitted earlier? 25 A. Yes, that's right.	682 1 A. Yes. 2 Q. And you were shown a label in the '80s 3 with suggestion that it instructed users of paraquat 4 to wear waterproof clothing, correct? 5 A. That's one of the things I remember, yes. 6 Q. Okay. The latest label that you saw no 7 longer has any requirement for waterproof clothing, 8 right? 9 A. Okay. So you're now looking at number 92? 10 Q. That's right. 11 A. So I'm looking at the PPE. Right, okay. 12 So it says long-sleeve shirt and long 13 pants, shoes plus socks, respirator, 14 chemical-resistant gloves, etc, yeah. 15 Q. Okay. Long-sleeved shirt and long pants, 16 those are not waterproof, right? 17 A. Not necessarily, no. 18 Q. And that's not having long -- or 19 waterproof clothing is consistent with the labeling 20 information that I had shown you earlier in the 21 deposition, right, the one label that was shown to 22 you? 23 A. Okay. 24 Q. Is that right? 25 A. I would need to be re-shown that to...

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683 1 Q. Okay. This latest label also does not 2 require waterproof boots or shoes, right? 3 A. It certainly doesn't say "waterproof," no. 4 It just says "shoes." 5 Q. Now, you were asked some questions about 6 a 1966 document with respect to the skull and 7 crossbones being added to the warning label, correct? 8 A. Yes. 9 Q. Now, that skull and crossbones, that was 10 only added at the request of the EPA in lieu of 11 withdrawing paraquat's registration from the market, 12 right? 13 A. Again, I'd have -- you'd have to just 14 remind me exactly what that -- how that was 15 documented. 16 MR. DICKENS: I have no further questions, 17 thank you. 18 MR. NARESH: I have two questions but 19 I need to grab a document off the printer. Give me 20 two minutes. Everybody can just stay here. 21 THE VIDEOGRAPHER: We are going off the 22 record at 17:58. 23 (Off the record.) 24 THE VIDEOGRAPHER: We are back on the 25 record at 17:59.	685 1 subacute toxicity, certain findings related to that, 2 right? 3 A. Yes. 4 Q. And then it goes on to talk about, on the 5 second page, paraquat 200 grams per liter -- 6 (Stenographer interjection.) 7 MR. NARESH: Yes. 8 BY MR. NARESH: 9 Q. The second page, it says "200 grams per 10 liter spray strength solution"? 11 A. Yes. 12 Q. And then it discusses results, and it 13 says: 14 "One female in a group of ten was killed 15 in extremis on day 3 after a single 4-hour exposure to 16 0.15 micrograms per liter paraquat ion"? 17 A. Yes. 18 Q. And does this look like a description of 19 the study that we've been looking at that we've 20 referred to as the Agral study? 21 A. Yes, undoubtedly, yeah. 22 Q. And then it goes on to discuss EPA 6(A)(2) 23 guidelines? 24 A. Yes. 25 Q. Those are the 6(A)(2) guidelines that
684 1 FURTHER EXAMINATION ON BEHALF OF SYNGENTA 2 BY MR. NARESH: 3 Q. Dr. Botham, you were shown earlier 4 Exhibit 27 and I just have one follow-up question -- 5 well, one document to show you related to that. 6 Do you see in Exhibit 27 there are a 7 couple of embedded documents at the top? 8 A. Yes. 9 (Exhibit 94 marked for identification.) 10 BY MR. NARESH: 11 Q. I'm handing you a document marked 12 Exhibit 94. 13 A. Okay. 14 Q. And, Dr. Botham, it's my understanding 15 that the version that you're looking at, Exhibit 27, 16 the links aren't live, but it's my understanding that 17 Exhibit 94 is the second of the two documents -- 18 A. Yes, okay. 19 Q. -- embedded in Exhibit 27. 20 A. Mmm-hmm, all right. 21 Q. And if you look at it, the first 22 page says, "Overview of paraquat inhalation toxicity 23 in the rat." 24 A. Yes. 25 Q. And it discusses the acute toxicity and	686 1 we've been talking about here today? 2 A. That's right. 3 Q. And does this document give you any clue 4 about the context in which Exhibit 27 was created? 5 A. Yeah, I think -- yeah, this is helpful 6 because it reinforces what those guidelines say, 7 so acute toxicities in which the only change in 8 toxicity is a numerical decrease in MLD/MLC, etc., are 9 not reportable unless they would result in a more 10 restrictive toxicity category for labeling -- 11 (Stenographer interjection.) 12 THE WITNESS: So they describe the acute 13 -- the EPA guidelines that acute toxicity studies in 14 which the only change in toxicity is a numerical 15 decrease in the median lethal dose or median lethal 16 concentration are not reportable unless the results 17 indicate a more restrictive toxicity category for 18 labeling and also if, in the event, a use of a 19 pesticide does not pose -- 20 THE STENOGRAPHER: I'm sorry, Doctor, 21 you're really going to have to slow down. 22 THE WITNESS: Right. It also says use of 23 a pesticide does not pose any greater risk than 24 previously believed or reported to the agency. 25 So, to summarize that, it's very similar

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687 1 to what I said: that it would need to change 2 thresholds of toxicity that have been used to assess 3 hazard in the past, to put them into a different 4 category of toxicity because of potential greater 5 risk, and that was not the case here. 6 BY MR. NARESH: 7 Q. And the EPA 6(A)(2) guidelines referenced 8 in Exhibit 94, does that provide you with context to 9 understand whether Exhibit 27 was a document generated 10 in conjunction with European reportability as opposed 11 to US reportability? 12 A. Well, it seems to suggest this is more to 13 do with US reportability, yes. 14 Q. Okay. 15 MR. NARESH: I have no further questions. 16 MR. DICKENS: Nothing further. 17 MR. NARESH: Anybody on the phone or on 18 Zoom? 19 MS. BOSTON: No. 20 MS. SIMMS: Nothing here. 21 MR. NARESH: We'll read and sign, and 22 we'll designate as provisionally confidential in 23 accordance with the protective order. 24 THE VIDEOGRAPHER: We are going off the 25 record at 18:03.	689 1 CERTIFICATE OF WITNESS 2 3 I, PHILIP BOTHAM, declare that I have read the entire 4 transcript of Volume II of my Syngenta Corporate 5 Representative deposition, or the same has been read 6 to me, and certify that it is a true, correct and 7 complete transcript of my deposition given on 8 Wednesday, September 18, 2024, save and except for 9 changes and/or corrections, if any, as indicated by me 10 on the attached Errata Sheet, with the understanding 11 that I offer these changes and/or corrections as if 12 still being questioned. 13 14 15 16 Signed _____ 17 Philip Botham 18 19 20 21 Dated this.....day of.....20... 22 23 24 25
688 1 (Whereupon, the deposition concluded 2 at 6:03 p.m.) 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	690 1 CERTIFICATE OF STENOGRAPHER 2 3 I, LEAH M. WILLERSDORF, Registered Merit 4 Reporter, Certified Realtime Reporter, Fellow of the 5 British Institute of Verbatim Reporters, Qualified 6 Realtime Reporter Level 2, and Certified LiveNote 7 Reporter, do hereby certify that: 8 PHILIP BOTHAM appeared before me on Wednesday, 9 September 18, 2024, agreed to tell the truth under the 10 penalties of perjury, and was thereupon examined by 11 counsel; the testimony of said witness was taken by me 12 stenographically; the foregoing is a true and accurate 13 record to the best of my knowledge, skill and ability; 14 I am neither a relative nor employee of any party to 15 the action in which this testimony was taken; I am 16 neither relative nor employee of any attorney or 17 counsel employed by any party thereto; and, further, 18 I am not financially or otherwise interested in the 19 outcome of the action. 20 21 22  23 LEAH M. WILLERSDORF 24 RMR, CRR, FBIVR, ACR, QRR2, CLR 25 (September 27, 2024)