IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MISSOURI
SOUTHEASTERN DIVISION

BADER FARMS, INC.,	)	
	)	
Plaintiff,	)	
	)	
vs.	)	No. 1:16-cv-299-SNLJ
	)	
MONSANTO CO. and BASF CORPORATION,	)	
	)	February 10, 2020
Defendants.	)	

TRANSCRIPT OF TRIAL DAY #11 - VOLUME 11B
BEFORE THE HONORABLE STEPHEN N. LIMBAUGH, JR.
UNITED STATES DISTRICT COURT JUDGE

APPEARANCES

FOR PLAINTIFF:
Billy R. Randles, Esq.
Beverly T. Randles, Esq.
Angela M. Splittgerber, Esq.
Randles and Splittgerber, LLP
5823 N. Cypress Ave.
Kansas City, MO 64119

Tracey F. George, Esq.
L. Benjamin Mook, Esq.
Brett A. Davis, Esq.
Davis George Mook, LLC
1600 Genessee St., Suite 328
Kansas City, MO 64102

FOR DEFENDANT:
MONSANTO COMPANY
Jan P. Miller, Esq.
Sharon B. Rosenberg, Esq.
Thompson Coburn LLP
One US Bank Plaza
505 N. 7th St., Suite 2700
St. Louis, MO 63101

David E. Dukes, Esq.
Nelson Mullins
1320 Main Street
Columbia, SC 29201

FOR DEFENDANT: John P. Mandler, Esq.
BASF CORPORATION Anthony Finnell, Jr., Esq.
Tarifa Laddon, Esq.
Shane Anderson, Esq.
Faegre and Baker LLP
90 S. 7th Street, suite 2200
Minneapolis, MN 55402

Troy A. Bozarth, Esq.
Hepler Broom LLC
130 North Main St.
Edwardsville, IL 62025

REPORTED BY: Laura A. Esposito, RPR, CRR, CRC
U.S. District Court
111 South 10th Street
St. Louis, MO 63102
(314) 244-7739
Laura_Esposito@moed.uscourts.gov

Proceedings recorded by mechanical stenography; transcript produced by computer-aided transcription.

* * * *

INDEX OF WITNESS EXAMINATION

(Proceedings convened in open court at 1:19 p.m.)

(Following conducted outside presence of jury:)

MR. SHAW: Good afternoon, Judge.

Before we proceed I'd like to perhaps withdraw a couple of things from the Court's consideration. Number one would be our motion to strike plaintiffs' opposition to our motion for JMOL. And number two would be our Guenthner motion.

Of course, we would like to retain all the objections we have previously made, and reserve the right to refile the Guenther motion at the conclusion of all of the evidence. But we have more important matters, I think, to consider this afternoon. We have instructions before us and we'd like to just focus on that for now.

THE COURT: Okay. Good idea. Thanks.

MR. SHAW: Thanks, Judge.

MR. HOHN: Your Honor, just -- we'll just need five minutes before the next witness. We have a discreet issue we have to address before the next witness on some exhibits that the plaintiffs objected to.

THE COURT: Oh, you mean with me?

MR. HOHN: Yes.

THE COURT: Okay.

MR. HOHN: We could do it now or we could --

THE COURT: Do it now then.

MR. HOHN: What's that?

THE COURT: Maybe we should do it now.

MR. HOHN: Judge, our next witness is Dr. Phil Brannen, and he's a pathologist, plant pathologist. And we have a group of exhibits that we are intending to show the witness for demonstrative purposes as learned treatises, and we'd like to be able to show them to the jury pursuant to Rule 803.18 of the Federal Rules of Evidence.

We don't intend to offer them into evidence as exhibits, as the rule specifically provides that they would -- they can be shown but they can't be admitted into evidence. And, so, as I understand the plaintiffs' concern is they don't think we should be allowed to show them to the jury. And, so, under Rule 803.18, if there's a statement contained in a treatise, periodical, or pamphlet --

THE COURT: What do you mean by showing them to the jury? You don't want to pass them around, do you?

MR. HOHN: No; just put them on the screen, that's it. And, so, under 803.18, once we establish the foundation under subparagraphs (a) and (b) that it's relied on by the expert on direct and that it's a reliable authority under (b), then they should be able to be shown to the jury.

THE COURT: It says the publication is established as a reliable authority by the expert's admission or testimony, by another expert's testimony, or by judicial notice.

You're not going to ask judicial notice of me, are you?

MR. HOHN: No.

THE COURT: Thank you. So, okay. What's the objection then?

MR. RANDLES: Well, the objection is, the Court has consistently maintained its position that the jury can only be shown items that are put into evidence, and that is how we have proceeded through our entire case. When we wanted to offer the Bradley slides, for example, we had to establish that both companies had received them, as well as some other things the Court required of us.

I believe the appropriate use of a learned treatise, if you want to show it to a jury, is on cross-examination. I do not believe you can simply show things that the expert relies on and says that are articles and that sort of thing in general to the jury. What I said to defense counsel is, if you have a true demonstrative you wish to show the jury -- charts, pictures, other things -- then that's entirely appropriate, and we wouldn't object to a true demonstrative, but to just put up an eight-page article, a 20-page article, I think that's improper bolstering, and that's not appropriate in your case, in your own case.

THE COURT: So, this rule just pertains to the hearsay rule, exception to the hearsay rule. Doesn't talk about how you present it, I guess, does it? So --

MR. HOHN: It does at the very end, Your Honor. It says, "If admitted, the statement may be read into evidence but not received as an exhibit." And I do have a case from the Eastern District of Missouri, Your Honor, where that very same process was done. If you'd like it, I can hand it right up.

Basically, once the foundation's laid, then the statement can be read into evidence but not received as an exhibit. This is the rule for learned treatises.

THE COURT: So you want the statement to be read into evidence, is that it?

MR HOHN: Rather than it being read, I think it's more convenient just to show it on the screen as opposed to just having them read it verbatim. I don't think we need to waste the jury's time doing that. But I do think we are entitled under -- this, you know, would come in. Once that foundation is laid, it can be shown to the jury, and the rule's clear it just doesn't come in as an exhibit.

THE COURT: The only concern you have is whether it is read versus shown? Okay. I think I'm going to overrule that objection because we've had all sorts of testimony that has not necessarily been admitted. But anything that's read to the jury can be shown on the screen, so it's still not received as an exhibit, so how is the jury supposed to understand what it's received for?

MR. HOHN: Well, obviously, the witness is going to lay that foundation to say that it's something that he relied on and it's something that's reliable in his field.

THE COURT: Okay. I'll overrule the objection then.

MR. HOHN: Your Honor, just a housekeeping thing, we do have two labels that I discussed with counsel ahead of time that we'd like to move into evidence, and that is Exhibit M542 and 543.

MS. GEORGE: No objection.

THE COURT: Okay. They're admitted then.

(Defendant's Exhibit Nos. M542-543 admitted)

THE COURT: Anything else?

Okay. You can bring the jury in.

(Jury in)

THE COURT: You may proceed.

CROSS-EXAMINATION

QUESTIONS BY MS. RANDLES:

Q. Good afternoon, Mr. Mitchem.

A. Good afternoon.

MS. RANDLES: Your Honor, I would like to start with Plaintiffs' Exhibit -- I'm just going to read all four of them. They're already admitted into evidence. Plaintiffs' 2007, 2008, 2009, and 2010. We'll start with 2007.

Q. (By Ms. Randles) Mr. Mitchem, as I appreciate your testimony, you believe that, even though there was people

planting Xtend seed all around Bader Farms and they were spraying dicamba, there was no way that Bader Farms had suffered any dicamba injury. Is that your testimony? Is that correct?

A. Restate the question.

Q. I appreciate your testimony, you believe that there is no way that -- with all the spraying that was going on over Xtend seed, that there was no way Bader Farms was exposed to dicamba, correct?

A. I've seen new symptomology on peach trees as a result of exposure to dicamba.

Q. Okay. So I want you to look at Plaintiffs' Exhibit 2007. Were you in the courtroom when things were introduced into evidence?

A. Yes. Well, let me know what they are for clarification.

Q. So these are seed sale maps. They are maps that show within a 15-mile radius of Bader Farms. Bader Farms is this little green dot here. See that, that I just circled in red? And then all of the yellow or orange, whatever color that is, dots, those are dots that represent people who purchased Xtend seed within a 15-mile radius of Bader Farms, okay?

A. Okay.

Q. All right. So, Dr. Baldwin printed these and used

these in his testimony. And, so, this is for 2015. In 2015, these are the Xtend seed sales and around Bader Farms. And, as Dr. Baldwin testified in his testimony, he said that each dot represents only one purchaser. So, in other words, there could be -- and for some of these there may be thousands of acres worth of seed purchased, but each one represents just one dot.

Is it your testimony that, with all of this spraying in 2015, Bill Bader's farm still could not have been hit with dicamba?

A. I have no opinion about the seed sales.

Q. Okay. So you just don't know one way or the other?

A. My expertise is in peach tree response to herbicides and that's what I'm here to testify to, ma'am.

Q. What I'm asking you is: If you look at the map and see all of the seed sales and the spraying that would have been going on around there, is it still your testimony there's no way Bader Farms could have been exposed to dicamba?

A. Ma'am, my testimony is that I see no symptomology in the peach trees related to exposure to dicamba.

Q. So is that, absolutely not, you think that there's no way Bader Farms would have been exposed in 2015?

A. I see no symptomology related to exposure. I wasn't there in 2015. All my opinions are based on after I was --

had the opportunity to visit, which was in 2017, '18 and '19. Anything related to 2015 and 2016, I have no firsthand knowledge of.

Q. Okay. So you don't have an opinion about those years, correct?

A. No, ma'am.

Q. Let's go to 2008. These are the seed, Xtend seed sale purchases in 2016, and that's Plaintiffs' Exhibit 2008. Again, this green dot represents Bader Farms and all of these other dots around it are Xtend seed purchasers. And I understand your testimony is, you have no opinion about 2016, correct?

A. Yes.

Q. Let's move on to 2009, Plaintiffs' Exhibit 2009. This is 2017. That green dot represents Bader Farms, and all of these dots are either Xtend cotton or Xtend soybean seed that was purchased around Bader Farms in 2017. And, again, each dot represents only one shipment of seed. So there are farmers who have enough seed for thousands of acres planted around here based on the documents. Is it your contention that Bader Farms could not have been exposed to dicamba sprayed over the top of Xtend seed in 2017, looking at this map?

A. I have not seen any symptomology on peach trees related to exposure to dicamba at Bader Farms in 2017, '18,

or '19.
Q. Okay. So I understand your talking point. What I'm asking you is: When you look at this map are you really telling this jury that you think there's -- Bader Farms somehow escaped being exposed to dicamba in 2017?
A. I've seen no symptomology on peach trees that indicate they were exposed is to dicamba in 2017, '18, or '19.
Q. Do you know about how many acres Bader Farms expands to, just the orchards? Do you know about how wide the orchards are?
A. Restate your question.
Q. Bader Farms' orchards are approximately four, four-and-a-half miles. That's how expansive they are, correct?
A. I didn't measure that but I'll take your word for that.
Q. Your experience is, it stretches out quite a bit, correct?
A. Yes, ma'am, they're spread out a little bit.
Q. Okay. So with all of that spraying going on, over that large of an acreage, how could Bader Farms possibly have escaped it? Are you saying to the jury that there was a tarp over the orchards and that's how it would have escaped it?
A. Ma'am, I went into the orchards and I looked at them,

and I spent a lot of time there. I've seen no symptomology on any trees related to exposure to dicamba in 2017, '18, or '19.

Q. I understand that's your talking point. My question is: Do you think Bader Farms then just escaped it, and, if so, how would that have been possible?

A. Ma'am, my opinion is, they've not had any symptomology. There's not been any damage to those peach trees in 2017 or '18. And that's not a talking point; that's my full belief and that's my professional opinion to a degree of scientific certainty.

Q. But you'll forgive me if it sounds like a talking point since you're saying the same thing no matter what question I ask.

A. That's because it's factual.

Q. It may be, but if I ask you if the sun rises in the east, and you give me the same thing, it's a talking point to me. Do you understand that?

A. This doesn't have to do with the sun rising; has to do with the fact that there was no symptomology in the peach trees related to exposure to dicamba, 2017,'18, '19. It's not a talking point; it's just a fact.

Q. You're basing that on your, what, two or three experiences with dicamba sprayed -- direct spray applications to Prostko, Kevin Bradley's young trees, and

whatever you did in your back yard, correct?
A. Ma'am, I didn't do anything in my back yard. That would be incorrect to say I did anything in my back yard. I don't have peach trees in my back yard.
Q. Well, wherever you did it. After -- like immediately after I deposed you, you said you went and you did some research, so is that what you're basing your testimony on? It's a simple question.
A. Restate your question.
Q. We'll move on. Let's go to 2010, Plaintiffs' Exhibit 2010. Again, that's Bader Farms. Now, I don't think we need to go through the line of questioning again because I'm pretty clear what your answer's going to be.
I have a separate question for you. Do you think Bill Bader knows what his peach trees look like?
A. Yes.
Q. Do you think Bill Bader has always known what his peach trees look like?
A. Yes.
Q. So do you think that perhaps Bill Bader, when he says that his peach trees, from 2015 forward, started to look different in a way that he never seen them look before, you think he knows what he's talking about since he's the one who's seeing them day after day, year after year?
A. I know Mr. Bader testified that the crinkling and

curling, which I recognize, he agrees with me in his testimony that that's the normal appearance of the peach tree during the day.

Q. Mr. Bader also testified that his peach trees looked different. The crinkling and the curling, I think he said cupping of the leaves, that that was different. Did you hear that testimony?

A. He said it was different in the morning.

Q. He said it was different always.

A. I did not hear that testimony.

Q. Okay. Well, I will submit to you that that was Mr. Bader's testimony when he testified in this courtroom to this jury.

A. What I heard Mr. Bader say was that the crinkling and curling was a normal appearance for the peach tree during the day. That's what I heard.

Q. Well, what he said actually is that in the morning, that that is not typical, and then as the -- as you get to the heat of the day, that is more normal.

But, Mr. Bader testified before this jury that the trees, from 2015 forward, with the introduction of defendant's Xtend system, looked completely different, so my question to you is: Don't you think Bill Bader is better suited to look at his trees and say, *well, this looks completely different than is normal* than you, somebody who

didn't step foot on his farm until 2015 -- or 2017?
A. Ma'am, the experience I had looking at dicamba symptomology, if you take in the fact that the claim says there's been a 40 percent reduction in yield. Trees have died as a result of exposure to dicamba. If you're going to have that level of impact and you're going to have tree death, you're going to see terminal dieback, dead terminals, and that's what you're going to see.
Q. Mr. Mitchem, when you talk about "always going to" -- always going to see dieback, always going to see this and that -- you have no basis for saying that, correct?
A. To have a 40 percent reduction in yield, that's a pretty substantial impact on a tree. You're going to have to see dieback in the terminals to get that kind of impact on yield.
Q. Your experience with dicamba is direct spray applications, correct?
A. Yes.
Q. So the limited experience that you're talking about is with someone, you, someone else walking up to a peach tree with something and then just squirting dicamba right on that peach tree, correct?
A. That's all the information that's available is out there, yes.
Q. Okay. And so what I'm talking about is not someone

walking up to a peach tree and spraying dicamba directly on the peach tree. If a higher concentration of dicamba is sprayed on peach tree, a very high rate of dicamba sprayed on a peach tree, you're going to have dieback, correct?

A. If you're going to have a level of exposure result in a 40 percent reduction in yield and greater and cause tree death, you're going to have to have dieback because the very fact that the tree dies is indication that there's going to be dieback. That dieback is going to begin in those terminals. That's where the death is going to start.

Q. Do you remember my question?

A. I think I answered it, ma'am.

Q. You didn't answer my question. Do you remember my question?

A. You can restate it, ma'am.

Q. I will restate it. I'm not confident I'm going to get a different response or any answer to the question.

If you walk up to a peach tree and spray it directly with dicamba, that's not the same as the way dicamba affects a tree in the field, correct? I mean you're going to have dieback if you walk up to it and spray it directly. A high concentration, that was my question.

A. A high concentration, you're going to have dieback.

Q. So when we're talking about a one X-rate or half X-rate, that's what we're talking about with dieback,

correct?

A. No. You're going to have dieback at much lower rates than that. If you're going to have exposure to cold, that kind of injury, you're going to have dieback. Symptomology is going to be symptomology. If you get enough dicamba on it to cause harm, you're going to have death on the terminals and dieback.

Q. Again, have you done any research on volatilized dicamba or drift rates of exposure of dicamba?

A. Dr. Baldwin testified --

Q. Mr. Mitchem, I would like for you to answer my question this time, sir. I am not interested in you waxing poetic. I am asking: Have you, Mr. Mitchem, conducted any research on volatilized dicamba or direct drift dicamba on peach trees?

A. I have applied dicamba directly underneath peach trees in a peach orchard.

Q. So the answer to my question is, no, you have not. Thank you.

Now I want to deal just a little bit with -- and I know we haven't talked about this one very much. We've been talking about the Prostko study and we've at least mentioned Dr. Bradley's study on the peach and other trees. You're familiar with that, aren't you?

A. You talking about Dr. Bradley's study that Dillman

did?
Q. Yes. Dentelman, Bradley, a few others at the University of Missouri. You familiar with that?
A. I'm familiar with the document you're talking about, yes, ma'am.
Q. And in that study they concluded that dicamba -- symptomology for driftable fractions of dicamba to peach tree was extremely -- peach trees were extremely sensitive to it, correct?
A. Restate the question.
Q. That was a bad question. I apologize. Let me rephrase it.

In Dr. Bradley's study, they concluded that peach trees were extremely sensitive to dicamba, correct?
A. That was the subjective evaluation or opinion of Dr. Bradley. He described it as extremely.
Q. Wait a minute. It was subjective? Dr. Bradley is a scientist. This study is a scientific study. How would it be subjective?

MR. ANDERSON: Object to characterization, Your Honor.

THE COURT: Overruled.

THE WITNESS: What one person -- you know, he put definitions on that. That's his opinion that it was extremely. That's his opinion. That's what he expressed.
Q. *(By Ms. Randles)* Your testimony to the jury is that

Dr. Kevin Bradley at the University of Missouri, having conducted a two-year study on driftable fractions of dicamba over peach and other trees, his assessment was subjective?

A. I'm saying his evaluation, it was extremely susceptible. It was a subjective opinion. And that research was done on newly planted trees straight out of the nursery in a controlled environment. They weren't done in the field.

Q. Since you obviously place no stock in Dr. Bradley's study, did you pick up the phone and call him and find out why he used this so-called subjective analysis in this study?

A. That's Dr. Bradley's opinion. That's what he published.

Q. Okay. So, but --

A. I did not call him.

Q. But your opinion is that it's subjective because you don't like the way the results were rendered, correct?

A. I don't have a problem with Dr. Bradley's results.

Q. Well, there's nothing -- I've looked at this study, Mr. Mitchem. Dr. Ford Baldwin has looked at the study. He did not see anything about Dr. Bradley's conclusions as being subjective. So it bears to reason that this study would be conducted the way Dr. Bradley would do any other study, correct?

A. I'm not saying the study was subjective; I'm just saying that the label of "extremely" is subjective.
Q. Well, don't scientists rate things as extreme or moderate or light sensitivity to herbicides all the time? That's not something new to Dr. Bradley, is it?
A. We have a rating system usually presented as percent injury.
Q. This is not something that's new to Dr. Bradley, correct?
A. I don't have a problem with what Dr. Bradley wrote.
Q. This is not something new to Dr. Bradley, correct?
A. No.
Q. So when scientists do that, then they have a mechanism and a procedure that they put in place for assessing things in a particular category, correct?
A. Dr. Bradley's study is what it is. He presented the data as published.
Q. That's correct, his is. Dr. Prostko's study found no dieback at the lowest rate sprayed, correct?
A. Dr. Prostko's study, they took those observations in December. I was there and looked at the trial in August and there was dieback at the low rate.
Q. When you look at the study, there is no statistical difference between the nontreated controlled tree and the lowest level spray, which says, that indicates that there

was no dieback, correct?
A. The statistical difference was no different.
Q. And, likewise, Dr. Prostko's study also showed a loss of tree vigor, correct?
A. We talked about the loss of tree vigor earlier. After they went through the winter with the lack of chill, that confounded the vigor, and that had an impact there. In subsequent years after that they discontinued taking observations in because they saw no impact on vigor the following year.
Q. So the tree had a year to recover, and then there wasn't any more loss of vigor after it had a year to recover, correct?
A. If they put it out the first year, the following winter they discontinued taking any more observations on vigor because they didn't see any differences.
Q. So the tree had a year to recover, and then once it had a year to recover from the herbicide injury, there was no difference in the vigor, correct?
A. There was no observations made the year after that, no.
Q. And Dr. Prostko's study also showed yield loss at the lowest level tested, correct?
A. It showed a 15 percent reduction relative to the untreated check, and then at the -- that was at the

preliminary one percent. Then there's like a 16 at the .1 percent.

Q. So, Dr. Prostko's study -- I don't think this has ever been stated yet -- he only sprayed half the tree, correct?

A. Yeah. He went down the side of the road and turned a boom perpendicular to the tree and applied the material into the tree canopy.

Q. Right. So he sprayed one-half of the tree and left the other half of the tree unsprayed, correct?

A. Yes, ma'am.

Q. So if he had sprayed the entire tree, the yield loss would have been even higher, correct, even at though low level?

A. I don't know what the total yield loss would have been if he sprayed the entire tree.

Q. One other point I want to make just with respect to dieback, because you might find this interesting to know, Dr. Schnabel, BASF's expert witness, he said when he visited Bader Farms and inspected it he saw dieback. Were you aware of that?

A. No.

Q. Mr. Mitchem, are you aware that there's no safe tolerance that's been developed or established for dicamba on sensitive crop?

A. Restate your question.

Q. Are you aware that there is no safe level that has been established for dicamba on sensitive crop?
A. When I hear the word "tolerance," I'm assuming you're talking about tolerance relative to the consumption of fruit with dicamba residue in them.
Q. I'm just asking you a question. Are you aware that there is no safe level? And if you want me to break it down to peaches: Are you aware that there's no safe level that's been established for peaches?
A. I'm aware there's no tolerance established for dicamba use on peaches.
Q. Now, I ought to know this, but could you remind the jury, how many times did you say you were -- what years were you at Bader Farms again?
A. 2017, 2018, and 2019, ma'am.
Q. And when you were there -- just a moment.
And when you were there, you said you saw crinkling and curled leaves, correct?
A. On the peach trees, yes, ma'am.
Q. And you also saw crinkling and malformed leaves on a non-dicamba tolerant soybean field that was either near or at Bader Farms, correct?
A. At one time -- I did go in the soybean field one time, yes.
Q. Okay. So that was in 2017, correct?

A. Yes.
Q. And you've said repeatedly that you do not believe that Dr. Baldwin, with his Ph.D. in weed science and 40 some-odd -- 46 years or so of walking fields and diagnosing herbicide injury, is capable of diagnosing dicamba injury on Mr. Bader's peach trees, correct?
A. He spent 46 years walking fields, ma'am. He's not spent any time walking orchards.
Q. Your testimony is that Dr. Baldwin is incapable of doing this?
A. I never said that.
Q. Can we pull up -- I'd like to pull up an admitted document, Your Honor. It's B980. And if we could go -- I'm sorry.

Mr. Mitchem, are you familiar with this document?
A. No, ma'am.
Q. This document is -- you see the subject was, U.S. EPA. It is the part of the reregistration materials for the newer dicamba herbicide formulations, and this document stated -- the cover page is November 1st, 2018, but the document itself is October 31st, 2018. Okay?

I'd like to go to page 7 of the document.

So if you go to -- Mr. Mitchem, if you go to about the middle of the page where it says, "additional uncertainties include." See that? So go down to the third bullet point.

And it says, "While dicamba damage can easily be determined by the investigator because of the unique symptomology to sensitive, nontarget plants, in many incidents state investigators are not able to determine the precise source causing the dicamba damage."

Okay. Did I read that correctly?

A. Yes, ma'am.

Q. And then the next bullet point: "Visual symptomology for dicamba, regardless of formulation, is distinctly identifiable" -- it says "cupping on newly emerged leaves" -- "in sensitive plants."

Did I read that correctly?

A. Yes, ma'am.

Q. So, clearly, the EPA doesn't agree with your assessment that some someone like Dr. Baldwin is incapable of diagnosing and identifying dicamba injury on peach trees, correct?

A. I didn't see the EPA say anything about peach trees in this document, ma'am.

Q. They also aren't saying that in order to diagnose dicamba injury on a sensitive plant, you have to have -- it can only be that plant that you have worked with. There's nothing here specific about any plant. "While dicamba damage can easily be determined by the investigator because of the unique symptomology to sensitive, nontarget plants."

That's what it says. It doesn't make any distinction. And someone like Dr. Baldwin is a trained investigator, correct?

A. Dr. Baldwin's credentials were presented. I have no reason to dispute them.

Q. I'd also like to show, Your Honor, admitted already, Exhibit B979.

Mr. Mitchem, are you familiar with this document?

A. I am not.

Q. This is -- I will tell you this is part of the same sort of packet of materials that EPA released when it re-- approved an additional conditional two-year label for the new dicamba herbicides, okay? So, you see at the top, it says, "EPA and Registration Decision for Continuation of Use of Dicamba on Non-Dicamba Tolerant Cotton and Soybean."

I would like to go to page 23 of the document.

Mr. Mitchem, I am at -- do you see where it says "confirmatory data"? I'm going to started one sentence above that.

A. Yes, ma'am.

Q. The sentence below says, "The agency's new data and monitoring requirements for dicamba are listed below." Then it has confirmatory data:

(1) Field studies examining off-site movement of dicamba.

(2) Studies to investigate temperature

effects on volatility of dicamba.

(3) Ecological effects data on nontarget plants related to survival, growth, and reproduction for select sensitive tree shrub, woody perennial species.

Okay. Then if you go down to the very last paragraph there on the page, sort of at the middle of it, where it says "studying the impact." Do you see that?

A. Yes, ma'am.

Q. So it says, "Studying the impact of off-target movement from dicamba OTT" -- meaning over the top -- "applications on high-value specialty crops as well as privately owned gardens, landscaping, and orchards is of particular interest to the agency because, unlike cotton and soybean growers, managers of those types of vegetation do not have the option to purchase protective dicamba tolerant seed."

Did I read that correctly?

A. Yes, ma'am.

Q. Mr. Mitchem, were you at all aware that EPA was requiring the defendants to conduct additional research in these specific areas?

A. Not specifically, ma'am.

Q. And so I guess it's fair to say, if you didn't know that they were required to do that, you've not seen any data

from the defendants about these particular issues, correct?
A. No, ma'am.
Q. Were you aware that in July, late July of 2018, Reuben Baris, who was acting director of pesticide division for EPA, visited Bader Farms, along with Dr. Ford Baldwin and Dr. Norsworthy and others?
A. No, ma'am.
Q. So you were not in the courtroom when Dr. Baldwin gave that portion of his testimony?
A. I remember him talking about Jason Norsworthy and Dr. -- Dr. Norsworthy and Dr. Bradley, and I remember the name you mentioned, but I didn't know he was with the EPA.
Q. Okay. So, yes, Mr. Baris with the EPA. And so he visited Bader Farms in late July of 2018 to observe the damage. That's been the testimony in this case, okay?
A. Yes, ma'am.
Q. So, and then roughly three months later, EPA, in their decision to give another two-year conditional label, are requiring the companies to do research specifically on orchards. Do you think that's just a coincidence?
A. Ma'am, I have no opinion what the EPA's reasoning was for doing that.
Q. Mr. Mitchem, you don't know the precise -- wait a minute. I apologize. Bad question.
Are you a member of the Weed Science Society of

America?
A. Yes, ma'am.
Q. Are you aware that, in 2017, EPA -- or WSSA put out a writing that said a mere whiff of dicamba will cause injury in sensitive plants?
A. I don't recall that document specifically.
Q. If you will give me a moment, I could show it to you.
I know I have it. I'll find it in just a moment here. But while I'm looking for that, I'll move on.
You said -- oh, here it is. It's --
MS. RANDLES: Your Honor, permission to show the Court, the witness, and counsel Plaintiffs' Exhibit 366.
Q. (By Ms. Randles) All right. Mr. Mitchem, are you familiar with this document?
A. Not right off, ma'am.
Q. At the top it says, "Weed Science Society of America, WSSA," of which you say you are a member, correct?
A. Yes, ma'am.
Q. I would like to go down to the section toward the bottom of the page where it says "plant sensitivity." Do you see that?
A. Yes, ma'am.
Q. So, there, if we can --
MR. MILLER: Your Honor, objection, if we're going to be reading in parts of an exhibit that's not in evidence and

that learned treatise is nothing.

THE COURT: He wasn't familiar with the exhibit.

MS. RANDLES: All right. Move on.

Q. (By Ms. Randles) Mr. Mitchem, I'd like to talk to you a little bit about some of your specific statements on your direct examination with Monsanto's lawyer.

I believe you stated that Dr. Baldwin -- you were talking about Dr. Baldwin pointing to the tops of the trees. Did I understand your testimony to mean that you believe that Dr. Baldwin is saying that you only look at what's going on at the top of the trees?

A. That's what he testified to, yes, ma'am.

Q. Mr. Mitchem, I can tell you, after having listened to Dr. Baldwin, I do not interpret his testimony to mean that you only look at the tops. The growing points, as you testified, are all over the tree, correct?

A. They are all over the tree, yes, ma'am.

Q. And, so, but if there is volatilized dicamba that's coming over Crowley's Ridge and settling on Bader Farms, where is it going to hit first? Or even a drift, where is it going to hit first?

A. Ma'am, I don't know exactly where it's going to hit first.

Q. Might be the problem. If we could pull up -- actually, you know what? I don't need to pull it up.

You also testified, again with Monsanto's lawyer -- and I apologize. I'm paraphrasing a little bit. But basically your point was, if there was dicamba exposure to the peach tree, then the weeds underneath the tree would also be showing dicamba exposure, correct?

A. One example was with weeds underneath the tree.

Q. You know what "dose response" means?

A. Yes, ma'am.

Q. Would you tell the jury, explain to the jury what "dose response" is.

A. If you have a dose response with increasing exposure of a certain material to a plant, say a herbicide, for example -- let's be specific. The more herbicides you put on it, you would expect the response to increase over time with increasing rates.

Q. And, so, you've heard the expression "the dose makes the poison," correct?

A. I heard it at our deposition, ma'am.

Q. Okay. So you also are aware that any herbicide, the way that it works is, if there's a genetically modified seed, it's going to be modified so that the -- it will kill the weeds at a certain rate and not kill the plant, correct?

A. You're talking about herbicide selectivity.

Q. Yes.

A. I'm aware of that.

Q. So then, for instance, with the Xtend soybean seed, you can spray up to a one-half X-rate twice a year, correct?
A. I'm not a soybean expert, but --
Q. Okay. And, so -- but you have to have a certain amount in order to kill those super weeds and those pig weeds, correct?
A. You have to -- if you're going to kill them, you have to have a certain amount of herbicide.
Q. So, Mr. Mitchem, it's not surprising that there would be weeds underneath the canopy of the tree that are still alive and kicking and not showing any symptomology even if the tree is being exposed, correct?
A. If you're going to have exposure of dicamba in these orchards -- another example is the picture that we showed with the honey milkweed up over the top of the tree, which the tree was underneath it. There wasn't any symptomology on it.
Q. Are you talking about the picture that Mr. Miller showed you earlier?
A. Yes, ma'am.
Q. You're correct, you were -- well, never mind. Don't worry about it.
MS. RANDLES: Your Honor, permission to show the witness and the Court and counsel Plaintiffs' Exhibit 2320. That's okay. I'll move on. They're having trouble

locating. It's no problem. We'll move on to the next one.
Q. *(By Ms. Randles)* But, Mr. Mitchem, my point is, with a pig weed or whatever grass you want to think of underneath that tree, it has to have a certain amount of dicamba on it in order for it to affect that weed. You would agree with that, wouldn't you?
A. Dicamba doesn't affect grass, ma'am.
Q. No. I'm talking about the pig weed and all the things that it's directed to impact.
A. If there would have been dicamba in the orchard, I would expect to have seen symptomology on the weeds.
Q. That's not an answer to my question at all, but I've so gotten used to this, I'm just going to move on.
Mr. Mitchem, you were looking at a picture that Monsanto's lawyer showed you earlier this morning. It was a picture of the catalpa tree in one of the Baders' orchards. Do you remember that?
A. Yes, ma'am.
Q. And I believe you characterized it as having some cupping, which I found difficult to see, but that was your testimony, correct?
A. Yes, ma'am.
Q. Could we pull up Plaintiffs' 2121, which has already been admitted, Your Honor.
Mr. Mitchem, this is that same -- this has been

admitted. This is the same catalpa tree from the Baders' farm, okay?

A. It's not the same catalpa tree.

Q. So you think this is a different catalpa tree?

A. I think so, ma'am, yes.

Q. How many catalpa trees have you seen at Bader Farms?

A. I don't know, ma'am.

Q. So I'm aware of the one. This is a picture that has been admitted into evidence of a catalpa tree. Do you see how cupped those leaves are? Do you see that, that extensive cupping?

A. Yes, ma'am.

Q. You could -- if you walk up to that tree and pour a glass of water in it, you could drink out of it, couldn't you? Or beer or whatever you want to drink.

A. I don't know if that would hold water or beer, no, ma'am.

Q. You see this extensive cupping here?

A. Yes, ma'am.

Q. And this was taken -- this photo was taken, Dr. Baldwin testified, later in the summer. During the spring that occurred. And you're saying that this tree could exhibit this symptomology and it have absolutely no effect on Bader Farms' peach trees?

A. Ma'am, I don't know for sure what that symptomology's

from.

Q. Well, it's not from weed pressure, is it?

A. I wouldn't think so, ma'am.

Q. Or any of the other things that you've named, disease?

A. I don't know, ma'am.

Q. Is that classic auxin herbicide symptomology on that tree, Mr. Mitchem?

A. It could be auxin symptomology.

MS. RANDLES: Okay. Thank you. I have no more questions, Your Honor.

THE COURT: Mr. Miller?

MR. MILLER: No further questions, Your Honor. Thank you.

MR. ANDERSON: Nothing, Your Honor. Thank you.

THE COURT: You may step down.

THE WITNESS: Thank you.

THE COURT: Call your next witness.

MR. DUKES: Your Honor, Monsanto calls Dr. Phillip Brannen. And I have some notebooks to pass out because I think it would be more efficient.

DR. PHILLIP BRANNEN, DEFENDANT'S WITNESS, SWORN

DIRECT EXAMINATION

QUESTIONS BY MR. DUKES:

THE COURT: You may proceed.

Q. *(By Mr. Dukes)* Good afternoon.

A. Good afternoon.
Q. Introduce yourself to the jury and tell us what you do.
A. My name's Phillip Michael Brannen. I go by Phil. I am a plant pathologist for The University of Georgia. I'm also a professor. My work relates to helping farmers solve their problems. I do a lot of extension work, and so I'll give more details in a minute.
Q. What is a plant pathologist?
A. Well, a plant pathologist is someone who studies plant diseases basically. So, I study plant diseases, I learn about the plant diseases, and I develop ways to solve those problems associated with plant diseases.
Q. If we could call up Slide 1 just for the Court, counsel, and the witness, please.

Is this a slide that you prepared just to help us move quickly through your background?
A. Yes, sir.

MR. DUKES: Your Honor, I would offer this as a demonstrative.

THE COURT: Objection?

MS. RANDLES: No objection.

THE COURT: You may use it.
Q. *(By Ms. Randles)* Would you --

MR. DUKES: May we publish this to the jury, please?

THE COURT: Yes.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) Dr. Brannen, would you go through and just explain what your academic background is.

A. Yes. I had a -- my undergraduate degree was in plant protection and pest management. That was actually through the plant pathology department. That's actually a degree that covers basically a little bit of everything associated with integrated pest management. Plant pathology mainly but a little bit of weed science, a little bit of entomology. And so that was my undergraduate degree.

I then had a Master's, also in plant pathology, from The University of Georgia. And then eventually, after working for a while, I got a Ph.D. at Aubrey University, again in plant pathology.

Q. Okay. Let's take you back a little bit. Where did you grow up?

A. I grew up on a small farm outside of Statesboro, Georgia. That's near Savannah, if you know where that is, so it's about 50 miles from Savannah.

Q. While you were in college did you work?

A. I did.

Q. What did you do?

A. I did anything I could to eat at one point. But, no. I did a lot of work. I worked in Minute Marts. I worked in

warehouses. I worked in tobacco warehouses for a couple of summers. I actually worked for a year with professors in plant pathology. I was in ROTC and National Guard. So I did a lot of different things in that four-year period.

Q. Why did you choose plant pathology as your focus?

A. Well, as I said, I grew up on a small farm, so agriculture's always been a place that's dear to me, I guess. But I also enjoyed the sciences, and I enjoyed microbiology. And plant pathology is basically applied microbiology, so it's a way of actually using the sciences to help solve problems for people in the real world, farmers, for example.

Q. Did you have any jobs in agriculture between getting your Master's degree and getting your Ph.D.?

A. I did. After I finished my Master's, I worked as a county extension agent. You all heard people talking about county extension agents. It's basically for land grant universities. University of Missouri here would be a land grant. University of Georgia is a land grant, and Aubrey University's a land grant. I worked in Alabama for Auburn University, prior to getting my Ph.D., as a county agent, so I would be the first line of contact if a farmer had a question. If there's any kind of issue that came up, that I would be able to help them with that.

Q. And what's the next thing that you did after you

received your Ph.D. from Auburn University?
A. I went to work for industry for a period of time. So I worked for six years outside of Dallas, Texas for a company called Gustafson. Gustafson was a seed treatment company. At the time I worked for them they were the predominant seed treatment company the NAFTA region. But we treated all the seed, cottonseed, peanut seed, any kind of seed you could think of that was growing in the United States was treated with our products. And we worked on fungicides, insecticide, various things. In my job I actually led a lab that was a plant pathology lab, and we developed seed treatments. That was part of what I would do as a plant pathologist there.
Q. We can take Slide 1 down, please. Is The University of Georgia the land grant university for Georgia?
A. Yes. It is, in fact, another land grant university.
Q. At some point were you a named a full professor in plant pathology at The University of Georgia?
A. Yes, sir.
Q. When was that?
A. 2012.
Q. Tell us what you do as a professor in plant pathology.
A. Well, again, I mentioned there's a three-prong, or a three-legged stool if you look at a land grant university. There's a research, teaching, and extension, and I do a

little bit of all of that.

My predominant assignment is with extension or outreach, and that's where I'm helping real people, real farmers in the real world solve real problems. But I also do -- actually do research, and that's field-applied research where that's how I help them solve their problems. If they got a problem, I have to figure out how to solve that, and I'll do research to address that.

And I do teach undergraduate classes. I teach graduate level classes as well. And right now I've got five graduate students. I got Ph.D. students and Master students under my direction.

Q. Now, are you what I've heard called a mud-on-the-boots professor or do you normally walk around looking like you do today?

A. This is very unusual for me. I don't even dress like this for church. So, no, I'm definitely most of the time in bluejeans and a pair of boots or something like that. That's my standard.

Q. And that's a good point. Have you ever testified as an expert in court before?

A. I've not testified as an expert in court, no.

Q. All right. Now, you've been involved in several cases as an expert but just never testified in court?

A. That's correct. I've been involved in a few, very,

very limited number.
Q. You talked about the three legs of the stool. One was extension work. Tell us what you do from an extension work standpoint.
A. Well, again, I do farm visits. I work with producers if they have a problem, but also do educational meetings. A lot of it's training and developing training materials to help producers know how to do things. And so I work, again, directly with the county agents, helping them be trained also in how to help the producers. It's definitely a boots-on-the-ground type job.
Q. When you show up to help a farmer, do you start your clock like lawyers do and start charging, or do you not charge farmers for extension work?
A. No. Extension work is gratis, so we're there to help, so we don't charge anything at all. It doesn't matter if you're a millionaire or a poor farmer. We're going to work with you and we're going to give you the same service.
Q. What type crops do you work with in your extension work?
A. I work with fruit crops. When I first moved to Georgia, I worked with all the fruit commodities in Georgia, so I did work with blueberries and blackberries and peaches and apples and a litany of other things. About three years ago they were about to work me to death, and somebody

finally realized that, so I hired somebody down in South Georgia to take some of the responsibility there, so they have blueberries and blackberries now, but I still handle peaches and wine grapes and apples and strawberry and a few other commodities.

Q. How long you been working with farmers to diagnose diseases in peaches?

A. I've been there for 20 years, and from the day I got on the job I've been working on peaches, so that's one of my major responsibilities.

Q. And as part of your job, do you have to be knowledgeable about how to diagnose diseases in peaches?

A. Absolutely. It goes with the trade. You have to know what your diseases are in order to do any good.

Q. Do you have some knowledge in herbicide science, weed science?

A. I do have some. And when I say that, I mentioned my undergraduate degree, in which it was an integrated pest management type program, so I did get some coursework in weed science. When I finished my undergraduate degree I did an internship with Eli Lilly, and we did a lot of herbicide testing that summer I was there. But that's really the extent of my weed science background. But I'm definitely not an expert when it comes to weed science.

Q. All right. Are you here as an expert in dicamba?

A. I am not.
Q. Are you here as an expert in herbicide injury to peach trees?
A. No, I am not.
Q. What field of study are you an expert in?
A. I am a plant pathologist, plain and sample, and I do diagnostics in the field.
Q. That's going to be the focus of your testimony this afternoon, correct?
A. Yes, sir.
Q. All right. Throughout your career how much of your work is focused on peaches?
A. Well, in the last 20 years since I went to The University of Georgia, I'd say about 50 percent of my effort and time has been put on peaches, and it still is.
Q. Where has most of that work on peaches taken place?
A. Most of it has taken place in Middle Georgia. That's our predominant peach production area. That's where the vast majority of peaches are and our big operations are. We do have some production in South Georgia, there's a pocket down there. And then we have some peach production scattered throughout the mountain regions in North Georgia also. So it's all over the state, but the biggest part of it's Middle Georgia.
Q. You've done some work on the ridge in South Carolina

where I worked on a peach farm?
A. I did. I actually spent -- when I first went to Georgia, I spent a good bit of time over South Carolina for the first few years. We had some research projects that we were doing the same type of research in South Carolina, so I was traveling over there a good bit, too. So I'm familiar with a lot of those farmers, too.
Q. Despite being the peach state, does Georgia produce more peaches or does South Carolina?
A. You would bring that up. Nonetheless, yes, South Carolina does produce more peaches than Georgia, but Georgia produces better peaches. Let you know that.
Q. I was told not to ask questions I did not know the answer to unless it was proven.

Do you use the same approach when you're diagnosing diseases in peach trees for your day job, you know, when you're not around a bunch of lawyers, that you used in this case?
A. Yes, I did. Essentially, I approached this case in exactly the same way I would approach diagnostics in the field, wherever I would land. So it's the same technique. Everything I've done here in Missouri is the same as I would have done in Georgia. Wherever I would land to diagnose something, that's what I would do.
Q. You also mentioned that you've done research in

peaches. How many years have you done research on peaches and peach diseases?

A. Again, I've been doing research for 20 years on peaches.

Q. Have you provided lectures both in the classroom and to professional organizations about diseases in peaches?

A. I have.

Q. Did you help prepare a slide showing some of the presentations that you've made relating to peaches and diagnosis of peach tree disease?

A. Yes, sir, I did.

MR. DUKES: If we could pull up Slide 2 just for the witness, the Court, and counsel.

Your Honor, I ask to publish this to the jury, please.

THE COURT: Any objection?

MS. RANDLES: No objection, Your Honor.

Q. *(By Mr. Dukes)* All right. In total, just estimate how many presentations you think you've made on -- professional presentations about peaches and fruit trees and management and diagnosis of diseases.

A. I have somewhere around 150 total presentations. About half of those are extension farmer type presentations and about half of those are academic presentations.

Q. And could you just give the jury some examples of the type of forums in which you've made those presentations.

A. Some of these on the slide here, on a yearly basis I go out to the Southeastern Regional Peach Conference in Savannah, Georgia, so I talk to producers there from throughout the southeast. I've been throughout multiple states. It's got Arkansas listed here, Michigan, Florida. Been to Canada also and talked at peach meetings there. On a yearly basis I go to Southeastern Professional Free Workers Conference and have given presentations there as well. That's a good representation of the types of meetings that I participate in relative to peaches.

Q. Okay. We could take Slide 2 down.

Now, do you see Armillaria and other types of peach diseases in your work as a professor?

A. I do.

Q. Are you familiar with how the symptoms of these diseases present themselves in peach trees?

A. I am very familiar, yes.

Q. And what process do you follow in diagnosing diseases in peach trees?

A. Well, in general, if I go into a field, I'm always going to give it an overview. So, basically you eyeball the orchard to see what you can see immediately. I'll look for things like white weeds or things like that, obvious things that would be out there. And then I will go into the actual tree itself and start looking, especially if there's

anything symptomatic about a tree, and I will take notes on anything that I see that I might know or might not know about the tree itself.

And I'll usually do testing. And, by that, one of the standard type things we'll do is take soil tests, look for nutrient issues. So I'll take soil tests at two different depths. I'll always take tissue samples, look for nutrient analysis; sometimes take virus samples, nematode samples. Nematodes are worms that live in the ground that will eat the roots of the peach trees, so we'll sample for that.

If I see any type of root rot or any type of rot type disease, I'll try to get some kind of sample for that, too. That usually requires digging in the ground to get at the roots or the crown of the plant. I'll also look for things like insect damage. There are a lot of things that look like a disease at first but they're actually caused by things like an insect or something. Borer type damage is an example. But I'll do all those types of things.

Q. Did you follow that process in your work you did in this case?

A. I did.

Q. Do you keep up with the scientific literature and research as it relates to peach tree diseases?

A. Yes, sir.

Q. Have you published any scientific literature that

relates to peach trees?
A. Yes, sir.
Q. Approximately how many articles about peach trees and peach diseases have you published?
A. In total, specifically related to peaches, there's probably about a hundred different articles. Again, some of those are extension articles, some of those are academic articles, some of those are reports, but all total, about a hundred.
Q. Have any of those articles focused exclusively or just specifically on Armillaria?
A. I'm not aware of any article where I've exclusively talked about Armillaria, no.
Q. Do you have personal experience in diagnosing Armillaria in peach trees?
A. I do. I do it every year. I do it with farmers, so I've done it in that way. I train graduate students every year on how to identify -- I usually take about 20 graduates students, or 25 every year, and we tour the state. I take them to peach orchards and we actually get to look at Armillaria, so it's something I train people on how to do.
Q. Are you being paid for your time working on this case?
A. I am.
Q. How much per hour?
A. 250 an hour.

MR. DUKES: Your Honor, at this time Monsanto offers Dr. Brannen as an expert in plant pathology and in peach disease diagnosis and management.

MS. RANDLES: No objection.

MR. DUKES: Thank you, Your Honor. I'm prepared to go forward. I don't know if you want to take a break.

THE COURT: Keep going?

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) Let's talk about opinions. Dr. Brannen, in preparing your opinions in this case, what types of materials did you review?

A. Well, obviously, I reviewed my notes I took in the field and all the stuff that I had. Also looked at the things that were provided by the plaintiffs. I looked at information that was in the literature, so articles and things of that nature that I needed to look at, and so a litany of different things. I reviewed all the depositions from all the experts, from Mr. Bader, from everybody I think that's been involved in this. I've at least read through their depositions.

Q. Did you review scientific literature relating to peaches?

A. I did, yes. Yes, sir.

Q. Did you review Mr. Bader's records relating to peach production at Bader Farms?

A. I did look over those, yes, sir.
Q. Did you rely on your own training and experience in reaching your opinions in this case?
A. Yes, sir. They're my independent opinions.
Q. Did you also rely on trips to Bader Farms and your observations of Bader Farms to reach your opinions?
A. Yes, I did.
Q. And how many times did you visit Bader Farms?
A. I visited four times.
Q. And I assume they didn't let you just wander around. Was Mr. Bader or some of the lawyers or some other folks there with you?
A. There were always lawyers with us. Mr. Bader was there with us most of the time. I think Cody was there one of the times, his son. So someone, a representative of Bader Farms, and lawyers went with us.
Q. What were the dates of these four visits?
A. The first visit was in July of 2017. Then about mid-September of 2017. And then I went again in July, and that was 2018. And then late May of 2019.
Q. Can you walk the jury through what you did on your first visit in July of 2017.
A. Just like I told you a while ago, I did the same technique that I would do when I'm diagnosing anything in the field. So, I walked into the field or any of those

orchards that were out there, and I started taking notes and making observations of what I see that were obvious things. So I wrote those things down. I made notes on weed management and any kind of weed type stuff I saw, any kind of symptoms in the trees.

And then I'd walk up to the tree. I'd start looking for anything else that would be a problem, and I made notes on that, too. If there was anything like borer damage or anything at all, I would record that. I also took soil samples. So I took soil samples at two depths so I can get an idea the nutrient status of the farm, and that gives a baseline. It's kind of like when you go to a doctor and they take blood and try to figure out what's wrong with you. That's what I'm doing, too. If you look at a peach orchard like a patient, I'm trying to figure out what's wrong with it.

So, I take the two soil samples. I take leaf samples also for nutrient analysis. I took leaf samples for virus analysis because I wanted to know if it had any viruses in it or not. Then I'd also take nematode samples, again looking at these little worms that live in the soil, they eat the roots. And I wanted to see how many of those were in the soil.

Then I also, based on observations, I saw what looked like Armillaria root rot, and so I started digging in soil.

Take a shovel and actually dig into the soil and actually find the fungus, which is Armillaria, which I observed there throughout Bader Farms. And so that's the type of thing I would do.

Q. All right. Now, we're still just focused on that initial July 2017 visit. So what were your initial impressions?

A. Well, there were a lot of things that were obvious. I mean there were some things -- as we walked into the orchards, you could see that weed control was less than optimal. That's one of the things that was obvious, and that could cause potential stress. Could take out a hand lens and I could look and see on the leaves, there were a lot of mites. European red mites were prevalent in that particular visit. They weren't prevalent on all visits but they were in several of the orchards at that time, so that was causing some symptomology as well.

Again, you see discoloration of leaves and things that would lead you to certain conclusions. But the main thing that I observed was dead and dying trees. That's what I really could really just look at and say, there's a lot of dead and dying trees there. And so that led me to look at the Armillaria root rot and to dig into the soil around the base of the tree and actually confirm Armillaria root rot.

Q. Okay. Now, we've been talking about your first visit.

You went three more times, correct?

A. I did.

Q. And were some of those visits over multiple days, not just one-day visits?

A. That's correct. The first visit we were limited to only one day, and then the other visits, all of them were two-day visits at least. So we had one really long day and then the next day we'd usually finish up.

Q. If we could call up Slide 3 just for the Court, the witness, and counsel.

Now, is this a slide that you prepared to help illustrate the peach sites that you visited over the course of your four times at Bader Farms?

A. Yes, sir, it is.

Q. And do you think this would be helpful for the jury to understand your testimony?

A. I do. I think it would be enlightening.

MR. DUKES: Your Honor, we would offer this as a demonstrative exhibit.

THE COURT: Any objection?

MS. RANDLES: No objection.

THE COURT: You may.

MR. DUKES: If we could publish to the jury, please.

Q. (By Mr. Dukes) What do the green rings on this map indicate?

A. So each of these green rings actually represents a place where I got out of the pick-up truck and took a GPS reading. You'll see sometimes there are four of them on top of each other. That's four visits. So they're all representative of all four of the visits that we went on. But it gives you an idea of where we were in Bader Farms as far as the peach orchards.

And we pretty much covered the peach orchards in Bader Farms. We went -- so we didn't just stay at that one spot. That's where we'd get out of the pick-up truck, and then we would walk through these orchards and actually look throughout the orchards. And, again, for me -- the first visit in particular, I'm taking samples and also digging in the ground to find what I'm looking for. So it's a lot of work. Very long day just trying to go through all those orchards.

Now, we saw different numbers of size depending on what visit we went on, so it's variable how many different orchards we visited on each year.

Q. Did you have input from Mr. Bader about the orchards that he wanted you to look at?

A. We did. He took us to all the orchards he wanted us to see on each visit.

Q. Do you think you saw every single orchard?

A. As I understand it, there's some kind of off-site what

I call off-site orchards that I've not seen. That's been related to me. I think there's some other orchards I did not visit but, again, we went to every orchard we were asked to go to.

Q. And in total, can you estimate for the jury how many approximately how many hours you spent at Bader Farms inspecting it?

A. Somewhere between 60 and 70 hours on the ground because, again, the days were long. I think Mr. Mitchem already mentioned we'd get up, go in, and start and go 'til dark, so those were pretty long days.

Q. After visiting Bader Farms the four times, were you able to determine what the cause of tree death, peach tree death was at Bader Farms?

A. Yes, sir.

Q. And what did you determine?

A. I determined the predominant cause of peach tree death at Bader Farms is Armillaria root rot.

Q. Was there a specific type of Armillaria root rot that you identified?

A. Yes, sir. There's specifically Armillaria tabescens is the Armillaria species that's causing the root rot.

Q. Was the appearance of the fungus itself when you saw it, was it consistent with Armillaria?

A. It is. Essentially there's no doubt in my mind. We

walked into the orchards and got Armillaria root rot in those orchards, and it looks like it does in Georgia or anywhere peach trees are grown where Armillaria is present.

Q. You talk about physically cutting into the peach trees. What do you cut into the peach trees with?

A. You're cutting into the peach tree with a shovel. Acutally, what we're doing is we're digging a hole right next to it. We'll see some photographs of this, I think, in a minute, but you're actually digging a hole right next to the tree, and then the fungus is actually between the bark and the woody tissue. Then you have to scrape that off with a shovel in order to find the fungus.

Q. Is Armillaria something you know it when you see it?

A. Yes, sir.

Q. Now, in addition to confirming by digging into the tree and into the soil and seeing the Armillaria fungus, did you do anything else? Did you send the fungus off for any tests?

A. We did. I didn't do that on the first visit. First visit I just took samples and made notes and said where I saw it and observed it. On the second visit I decided it would be a good idea to go ahead and get a genetic analysis identification of it. And I would not normally do that. If I was in Georgia, if I would go out into a peach orchard and identify Armillaria root rot, I'd say that's Armillaria root

rot because I know what it looks like.

But for the purposes of a court case, it's a good idea to get that kind of confirmation, and I also wanted to make sure it was, in fact, Armillaria tabescens, the same Armillaria that I'm familiar with, so I did send off samples on the second visit and the third visit to Clemson University for confirmation that this was, in fact, Armillaria tabescens. And we got that on both those visits. I did not do that on the fourth visit. I was already confident that's what we had.

Q. In addition to identifying the Armillaria fungus that was killing peach trees at Bader Farms, did you make some other observations about other things that could be impacting the farm?

A. I did. Again, with all the sampling I did and just observations, I have, you know, quite a few things I did observe there.

Q. Did you prepare a slide? If we could pull up Slide 4 just for the Court, for the witness, and for counsel that would help illustrate to the jury some of those other things.

A. Yes, sir.

MR. DUKES: Now, we'd like to publish that as a demonstrative, if there's no objection.

MS. RANDLES: No objection.

THE COURT: You may.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) So would you just explain to the jury what you've listed here.

A. Yeah. This is kind of a rundown of the things that we did observe there. Quite a few things, and that's a wide list, obviously, but in the young trees we looked at those as well. Some of them were dying. In that case we were finding improper planting depth to be the predominant reason. They were planted too deep so the roots were not getting enough oxygen. It was too wet and those plants would rot often times and die. So we did observe that.

We did see the results of cold damage that he mentioned. Mr. Bader mentioned some of the cold damage, and we did observe that from time to time. We did see drought stress on the trees. Part of the symptomology you see on these trees is related to drought stress as well. We saw trees that were just aging out. Trees are just like us, they get too old and they eventually die, and so we did see trees were breaking down from that.

I observed a bacterial disease that's on the leaves, and the leaves will fall off if you have a lot of that. We saw some orchards where they were losing leaves.

From the virus testing, I found one virus. The necrotic vein spot virus was present, and that's one we

don't want there either, but it's just one of the viruses you can have.

I did see dagger nematodes. Again, that's a concern because they eat directly into the roots themselves and they can also transmit certain viruses, so they were there.

Then we saw various varmint type damage. Deers were eating the young peach trees a good bit. And we saw voles, which are -- looks like mice almost, that live in the ground or around a tree, and they'll eat the roots and kill a tree too. And we did see some death from that as well.

The weed management practices, in general, often were -- were not what I would like to see, especially with herbicide free strip. And we've talked about that, or that's been talked to you before by Mr. Mitchem. So, herbicide free strips are good for a peach tree, and that -- if you have too much weed, you're going to have stress on the tree.

I looked at his disease management practices in general. We did see some farm implement damage also where equipment was hitting the trees with various operations, and that can open up holes in the tree where something could come in and kill it that way.

And then, as far as the nutrient analysis, potassium deficiency was the only thing I found that was really lacking in the trees.

Q. You know peach farming is a tough business, right?
A. It is tough, yes, sir. It really is.
Q. You've seen a lot of these issues on other farms, haven't you?
A. I have. And this -- when I give this total list, I'm not trying to criticize Mr. Bader in the process with this. I talk to farmers. I go out and visit farmers all the time. These types of things are going to be seen on peach farms from time to time, that's true. Peach farmers get behind on certain things. That's also going to be an issue sometimes with weeds. But all of these things are problems that farmers have to deal with if they're farming peaches.
Q. And can these issues actually affect peach tree yield, peach yield?
A. They are going to impact health, and there's no doubt that trees are going to be stressed as a result of these things, and sometimes the trees will die if there's many of these things also. So it's one of the things -- I'm not discounting. I'm not saying, yeah, we see them, but there was a lot of it at Bader Farms.
Q. You're not here to be nitpicking Bader Farms?
A. No. And, you know, again, I'm not criticizing Mr. Bader. I understand. I grew up on a small farm. His background and my background, until we got through high school was about the same, so I understand farming. It's a

tough business.

Q. So what's going to really be the focus of your testimony this afternoon?

A. Well, I'm going to talk about pathology. I only talk about diseases as it relates to Bader Farms and what I observed there, and then I'll also talk about diagnostics as related to what I observed as well.

Q. Okay. What is Armillaria root rot?

A. Well, Armillaria root rot is a root rot but it's also a crown rot of the peach. So, the crown is the point where the ground meets the trunk basically, so that's what you call the crown. But Armillaria root rot is caused by a fungus, and that fungus basically resides in old root pieces from trees that have died. And so in the case of like Bader Farms, it's probably old oak trees. Where oak trees used to be planted, there had Armillaria root rot. It's also called oak root rot as well. So those old root pieces are in the soil, and they'll stay in the soil, some people estimate, for 50 years. It's an interesting fungus and it can survive like that.

When you plant a peach tree, the roots move out into the soil, and eventually they contact that fungus. And then that fungus, it very aggressively attacks peaches, moves through the roots, goes to the crown, girdles the plant, and kills that tree outright. So it's a devastating disease of

peach trees.
Q. And in what areas of the country is Armillaria present?
A. Essentially it's present throughout the United States and really throughout the world. You'll find Armillaria all over the world.
Q. Are there oak trees around Bader Farms' orchards?
A. Yes. And if you look at Crowley's Ridge in particular, it's just covered up in oak trees. So oak trees are one of the predominant species of trees that are there.
Q. Before the Bootheel area of Missouri was cleared, was it forestland and swamps?
A. It was.
Q. Now, once present in the soil, what does Armillaria do to a peach tree?
A. Well, again, if it's there, it doesn't go away. So you really don't get rid of Armillaria. But as soon as the peach tree roots find Armillaria -- again, it's going to work its way back into that tree, and it will girdle it, it will kill it. So within a very short period of time, a year or two from the time that that root actually is found by -- or finds Armillaria, that tree will be dead.
Q. All right. Let's change subjects. Take a look at Tab 1 in your notebook. And just let me know when you get there. That's Exhibit DXM577. And just confirm for the

jury that this is an article by Kerik Cox, Harald Scherm, and Thomas Beckman titled, "Armillaria Root and Crown Rot."

A. That is correct.

Q. Do you know the gentlemen who wrote this article?

A. I do. I know all three of them well.

Q. Can you tell the jury a little bit about their reputations.

A. They have excellent reputations. Kerik Cox is currently at Cornell University. He was a student at The University of Georgia when he wrote this, or soon after he wrote this. And I was actually on his committee when he did his work on Armillaria root rot, so I did serve on his committee.

Harald Scherm is currently our department head, University of Georgia. He is a world renowned plant pathologist and one of the best plant pathologists I've ever known.

And then Tom Beckman is actually the breeder at the USDA station at Byron, Georgia, and he does breeding of rootstocks for peach trees. We may get into what root stocks are in a minute, but anyway, he's a rootstock breeder, and he breeds resistance into these rootstocks, and he actually works on Armillaria and breeding resistant rootstocks for Armillaria. That's one way you can get around it with peaches.

Q. Dr. Brannen, we really have not had any discussion about how peach trees are put together. You talked about rootstock. And that's the part that goes in the ground?

A. Right.

Q. And there are different varieties. Guardian is the primary variety, and Mr. Bader has 95 percent, I think, Guardian at his farm, or maybe a hundred percent. And that was actually discovered by Dr. Beckman, correct --

A. That's correct.

Q. -- and others?

A. That's right. That's right. Clemson had some impact on that as well.

Q. What you're trying to do with rootstock, you're trying to get rootstock that's going to go in the ground resistant to pests and disease, right?

A. That's correct.

MS. RANDLES: Object, Your Honor. Leading.

MR. DUKES: I'll do better. I'll do better.

Q. *(By Mr. Dukes)* How do you take that rootstock and then create a peach tree that has different variety peaches?

A. Okay. Let me explain. Let me take a drink of water and I'll explain it to you. My mouth gets really dry up here.

So let me see if I can tell you how this works. So, we talked about rootstocks. There's two parts of a peach

tree. When you look at a peach tree, it looks like one tree to you. It's actually two trees. So rootstock initially is developed from a seed, okay. So you take a seed, like Guardian seed, which comes from the Clemson University, and in Tennessee they plant that seed. So you plant a little peach seed, put it in the ground, and it grows up into a sapling peach about this big or something like that, okay? Then in June -- and Mr. Bader talked about June budding peach trees -- somebody goes in and actually cuts off that tree at the base, probably about maybe 5 inches above the ground line, and so you've got something like this sticking up out of the ground.

Then somebody will take what's called a bud wood stick, and they'll take a piece of that bud wood stick, take a bud, make a little slit in the bark, and they'll put that bud right here, and then they'll seal that. And so you've got a Guardian rootstock, which has all the things you want with a rootstock. And then let's say you got an O'Henry peach, or a flame peach. When people talk about varieties of peach, that's a little bud that was put on that rootstock. It grows out the side at first and grows up, and so that's what a peach tree is. So when you buy a peach tree, you're going to have a rootstock and what's called a scion -- that's the above part -- and that's going to be done through propagation. I hope I made that relatively

clear to you anyhow.

Q. When somebody talks about, I've got 20 varieties of peaches that are producing peach trees that are being produced on my farm, that's because -- well, tell the jury what that's because of.

A. All those varieties are what we call the scion, or really the above part, okay. So these are the varieties you've got. Again, the rootstock -- you can have 20 different varieties of peaches or more and they can all be on Guardian rootstock, so that bottom portion is the Guardian rootstock; that top portion's whatever the variety is you want.

Q. Let's go back to this article we were discussing. Was it published in the Southeastern Peach Growers Handbook in 2005?

A. It was.

Q. And is the Southeastern Peach Growers Handbook, is that a respected and reliable source that plant pathologists and other scientists rely on?

A. It is. It is an excellent resource.

Q. And is it something that you rely on?

A. Yes, sir.

MR. DUKES: Your Honor, we would request to publish M577 under 803.18.

THE COURT: You may do so over objection.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) Could we call out M5771.1, please.

Now, if you take a look at the first sentence of this article, how was this important to your opinions?

A. Again, what it says is that the Armillaria root and crown rot, which is also known as a root rot, is a major cause of premature tree death in southeastern stone fruit orchards. So it sets in place the fact that this is already known to be a major cause of tree death, and so I'm saying that that's important. That's important to my opinions.

Q. And is this consistent what you've observed in southeastern peach orchards?

A. It is.

Q. Could we look at -- call out 1.2. So, we're now looking in the middle of the first paragraph on the first page of that article that's in front of you. It lists two types of Armillaria fungus that cause Armillaria root rot in the southeast. How is that important to you?

A. There are two different types: There's Armillaria tabescens and then there's Armillaria mellea, and these can cause -- they can cause this disease in the southeast.

Now, the one that is most aggressive and the one I'm going to be the most concerned about, and the one that's most often seen on peaches is Armillaria tabescens, and that's one of the reasons I wanted to have that testing

done. And so that tells us that we have the most aggressive pathogen here in peaches. It's just like it is in Georgia, just like it is in South Carolina. Same fungus, exact same aggressiveness.

Q. Could we look at -- call it 2.1, please. If you look at this first sentence on the second page, why is this information important to your opinions?

A. Again, it says that Armillaria infects root and ground tissues which results in the development of below and above ground symptoms. Well, again, this is a learned treatise which actually is a really good resource if you want to learn about Armillaria root rot in peaches. It's probably the best, simplest, most compact treatise on Armillaria root rot on peaches. And, so, when I see something like that, it allows me to say that I know what the symptoms are, I can relay those symptoms to you with using this treatise, and you can accept that treatise as being a good resource.

Q. We all know what roots are. Where are the crown tissues exactly on the tree?

A. The crown is basically where the trunk meets the ground. So, if any of the roots are right here, this is the ground line, that's the crown right there.

Q. If we could call out 2.2, please. Now we're on the second sentence of the second page of the full article that you have. And how is this important to your opinions what

the authors say here?
A. They say that, "Above-ground symptoms include chlorotic and stunted leaves with little terminal growth." And that's an early symptom of Armillaria root rot. We're going to go through symptoms of what are observed with Armillaria root rot and what I've observed on Bader Farms and let you know that's the same thing.
Q. All right. Let's take a look at 2.3, please.
Please explain to the jury what they're seeing here.
A. Again, "Above-ground symptoms can include chlorotic" -- and "chlorotic" means basically that they're washed out, yellowed out leaves -- "and stunted leaves with little terminal growth."
Q. And if we could call out 2.4, please. Moving on through this article. And how is this important to your opinion?
A. It says "a distinctive symptom." One of the things you can see is the curling of leaves along the mid-rib, and so this is also accompanied by bronzing of the foliage and stems, and then it wilts.
So, to describe what we're talking about with that curling of the leaves, if you think about a leaf, the little mid-rib that goes right through the middle of it, if that leaf curls around like this and makes it look like a bean pod or a cigar, that's what we're talking about. It will do

that to the leaves, and it also causes this bronzing or yellowing of the leaves. And, again, you'll see at that in some of the stuff we're going to show you.

Q. Do the authors actually have a photo of this condition in the paper?

A. They do.

Q. If we could take a look at 2.5, please.

A. Okay. And it says here -- this is the same thing, but I can show you. If you look at those leaves, you see how they're curled around each other. When you look at the mid-rib, they're actually curled back around, and that makes a bean pod or a cigar-shaped leaf.

Q. Did you observe trees at Bader Farms that had bronze leaves with curling around the mid-rib?

A. I did.

Q. Let's take a look at 2.6, please. We're, again, at the top of page 2, and the full article that you have. And how was that information important to your opinions in this case?

A. Again, this is similar to what we've observed at Bader Farms as well. So, as the disease progresses, you have a rapid yellowing in the foliation that occurs, and that's followed by death of individual limbs above diseased roots. And, so, you'll see what we termed the scaffold limbs. These are like the -- usually about the four main limbs that

come out of the bottom of the tree. You'll see those start dying usually one at a time, and Armillaria kind of works its way around and eventually kills the whole tree.

Q. And if we pull up 2.7, can you explain to the jury what they're seeing here?

A. Again, this is a tree that's in the process of dying. And you can see the upper left, that limb is dying, and that's what you'd expect to see. Again, limbs die. The tree doesn't always die all at once. It's usually a few of the limbs die and then eventually the whole tree dies, and that's what we're observing there.

Q. And did you see trees at Bader Farms that had these identical symptoms?

A. Yes, sir.

Q. Did you take pictures of trees that had these symptoms?

A. Yes, sir.

Q. Did you help prepare a slide comparing one of the trees you saw at Bader Farms with these symptoms with one of the trees in a photograph in this Cox article?

A. Yes, sir.

Q. Could we call up Slide 5, please, just for the Court and the witness and counsel.

Is this a slide that you helped to prepare?

A. It is.

MR. DUKES: Your Honor, we would request to publish Slide 5 to the jury as a demonstrative.

MS. RANDLES: No objection.

THE COURT: You may.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) Now, tell the jury what you're showing them here.

A. If you look at the tree on the right, this is the one that we just showed you from this Armillaria root and crown rot fact sheet, or article. And then you look on the left, this is an example of seeing that basically the same thing at Bader Farms. You can see the scaffold limbs are dying. In some cases these have already been cut off. You see there's like one limb left, and that one will eventually die. That's how the plant dies with Armillaria.

Q. And how many years have you spent in your career diagnosing Armillaria in peach orchards?

A. Twenty years so far.

Q. And have you personally observed these types of symptoms on peach trees in the field?

A. Anywhere that Armillaria occurs on peach trees, this is what you're going to see.

Q. And are these symptoms common with peach trees that have Armillaria?

A. Yes, sir, they're absolutely common.

Q. Now, what ultimately happens to a peach tree that has Armillaria fungus?
A. It will die. Once a tree has it, it's going to die.
Q. No cure?
A. No cure.
Q. Okay. Does the Cox article include a picture of a tree that has been killed by Armillaria?
A. It does.
Q. Let's take a look at 2.8, please. Now, tell the jury what you're showing them here.
A. That is a dead tree.
Q. Did you see peach trees look like this at Bader Farms?
A. I did.
Q. Did you take some photographs of those?
A. I did.
Q. Did you help prepare a slide comparing a dead tree in this Cox article to some of the dead trees you saw at Bader Farms?
A. Yes, I did.
Q. We could call up Slide 6 just for the Court, witness, and counsel.

MR. DUKES: Your Honor, we would request to publish Slide 6 to the jury just as a demonstrative.

MS. RANDLES: No objection.

THE COURT: You may.

Q. *(By Mr. Dukes)* Now, Dr. Brannen, explain to the jury what you're showing them here.

A. Again, this is another dead tree. Again, a dead tree is just a dead tree, and you have to know what killed it, but, nonetheless, that's what it does. Eventually you're going to have a tree that is dead from that type of symptom.

Now, there's another thing that is important. There's another disease that will kill a tree, and that's called peach tree shore life, but you're usually going to have suckers that come up from the base of it. When you see a tree that does not have suckers and it's dead, especially if you see a lot of these trees together, that's usually Armillaria root rot.

Q. And we can take that down. Thank you.

After a peach tree is infected with Armillaria root rot, generally how long does it take for the fungus to kill that tree?

A. Once it's infected, the tree's normally going to be dead in about two years. It can die quicker than that, it may live a little bit longer, but generally within two years.

Q. I'm going to move from an individual peach tree to a peach orchard. If you've got a peach orchard that has Armillaria fungus in it, what's going to eventually happen to that peach orchard?

A. Well, what happens is -- so if you just had one tree in your orchard that contacted Armillaria root rot, and I'm talking about one tree, that one tree is going to be infected when the roots grow into it and find an old root piece with Armillaria in it, it's going to kill that tree. But that's not the damning thing about it because if you just lost one tree, that would be fine. What happens is that fungus then moves root to root across the orchard. So it doesn't just stay in one place.

As that other tree is dying, it moves out through the roots, finds the roots of the adjacent tree, and it starts moving down the rows and across rows. So what you're going to see is pockets where this fungus is moving out from a central location. It will kill those trees. So once you get it in an orchard, it doesn't stop. It just keeps going through the orchard. And you can replant the orchard. It just gets worse each time you replant it because you just made that many more root pieces with Armillaria in it for the next planting. So every time you replant, the Armillaria kills trees faster and broader than it did before.

THE COURT: Counsel, you want to take a break?

Let's take an afternoon break for ten or 12 minutes. Remember the admonition I've given you repeatedly. So, go to the jury room. We'll call you back shortly.

(Jury out)

(Court recessed from 3:00 p.m. to 3:27 p.m.)

THE COURT: Preliminary matters?

MR. DUKES: No, Your Honor.

(Jury in)

THE COURT: You may proceed.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) If we could pull up 2.9. All right. And publish it to the jury, please.

Dr. Brannen, when we left off before the break we were still talking about the Southeastern Peach Grower's Handbook, and I pulled up another excerpt here, and we just ask you to explain to the jury why this is important to your opinions.

A. Again, this is a description of what you're going to see below ground, if I'm digging with a shovel and what I'm looking for with that issue between the bark and the woody tissue. And, so, it says, "The below-ground infection results and decay of woody tissue, it appears water-soaked initially, then it becomes white to yellow in color, spongy and gelatinous, and removing the bark at the crown and roots often reveals the presence of white to pale yellow fan-like sheets of mycelium, indicative of Armillaria."

So, the mycelium, that's a scientific term, but just think of a sheet of fungus basically, or fan-like sheet of

fungus is what you're going to be looking for.
Q. And did you see these fan-like sheets of fungus at Bader Farms?
A. I did.
Q. Now, if we could call out 3.1. And here's some comments from the authors about resistant rootstocks. How is this important to your opinions? I know you discussed rootstocks a few minutes ago.
A. I did. We've already talked about rootstocks. This is important relative to what rootstocks we're talking about today, okay, so that's why we're looking at this. And, so, it says here that, "Recent work has shown that small differences in susceptibility exist among currently available commercial peach seeding rootstocks. Nevertheless, all rootstocks should be considered susceptible to Armillaria root disease."

So, in effect, what this is saying is the peach tree rootstocks that we have now -- and that includes the Guardian and the Halford that's planted at Bader Farms -- there's really no resistance to Armillaria tabescens. There's none. It does not have resistance in it. And, so, peach rootstocks available today do not have resistance, so they're very, very, very susceptible.
Q. We can take that down. We're going to shift a little bit.

Does Armillaria have a history of infecting peach trees in the Missouri Bootheel?

A. It does.

Q. How do you know that?

A. There are actually articles to that effect, scientific articles that describe that.

Q. If you would turn to Tab 3 in your notebook for me, please. That's an exhibit marked M594. Just let me know when you get there.

A. I'm there.

Q. All right. Is this an article by Paul Steiner entitled, "White Root Rot: A Threat to the Missouri Peach Industry"?

A. It is.

Q. And in what year was this article published?

A. This is 1976.

Q. Is this the type of reference that scientists and pathologists like yourself rely on in your field?

A. Absolutely.

Q. And is this a reliable source?

A. Yes, sir, it is.

MR. DUKES: Your Honor, we would request to publish M594 pursuant to Rule 803.18.

MS. RANDLES: No objection.

THE COURT: You may.

MR. DUKES: Thank you, Your Honor.

Q. (By Mr. Dukes) Now, what is white root rot?

A. Essentially, that's just an older common name for Armillaria root rot. So that's what it was called here in the Bootheel area of Missouri at that time.

Q. And, again, this is published in 176?

A. 1976, that's correct.

Q. If we could call out 2.1, please. And why is this important to your opinions about root rot and Armillaria root rot on Mr. Bader's farm?

A. Again, it's important -- you can tell a little bit about the history of Armillaria in this region. If somebody says, Armillaria's not here, it's never been a problem before, that would be bad. Good for the peach industry but it wouldn't make any sense that we're seeing Armillaria here now.

Historically, Armillaria has been in this region for a long time, and this article actually says it's been there like 70 years or something like that prior to this article being published. And, so, this was 1976, so it's been around here for a long time and people have been aware of it for a long time. And it is -- even at that time he says, "It's currently threatening the survival of many orchards in Southeastern Missouri." So that was in 1976.

Q. And I'm going to remind you to slow down a little bit

because you get to leave as a witness but I have to stay here as a lawyer and I do not want to get in trouble with the court reporter.

A. Okay. I'm sorry.

Q. If I interrupt you --

A. I'll slow it down.

Q. -- it's well-intended.

Let's call up 2.2, please. How is this, what the author says here in 1976, important to your opinions today?

A. Again, it gives this historical background. And it says here, "The disease has been known in Missouri for over 70 years, but its contribution to severe tree losses in the Bootheel orchards has only been recognized for the last ten to 15 years."

But, again, as of 1976, he's saying it's been known and it's been around for at least 70 years, so it's not anything that's new in this area.

Q. Based on your research, how was Armillaria impacting the peach orchards in the Bootheel?

A. Based on what he's saying and also what I observed with Armillaria, it was severely impacting orchards and taking some of them out of business potentially.

Q. Did you hear Mr. Bader's testimony about how many orchards there were back in approximately 1976 and how many peach orchards there are in Missouri right now?

A. Yes, I did.
Q. Now, what does this article identify as the most frequent cause of white root rot?
A. Well, they call it clitocybe tabescens, but clitocybe tabescens is an old name for Armillaria tabescens. And now, actually today, since I started working on this case, actually that name's changed yet again. It's now called nez [phonetic] Armillaria tabescens. I'm just going to call it Armillaria tabescens because that's what I'm used to calling it. But taxonomists keep changing names all the times for these fungal organisms. It's the same organism.
Q. Where does this article say that Missouri peach farmers are again planting their orchards around the 1970's to try to avoid Armillaria?
A. It actually talks about them planting on the edge of Crowley's Ridge in order to try to avoid it, and so that's just a comment they made. So, they're moving basically peach orchards around, trying to get out of areas where Armillaria would be, trying to move into newer areas where maybe Armillaria is not.
Q. And where is Bader Farms located in relation to Crowley's Ridge?
A. Well, it's on Crowley's Ridge.
Q. Did moving the peach orchards to Crowley's Ridge, did that eliminate Armillaria in the Bootheel?

A. No. Unfortunately, again, because of the nature of the disease and the fact it's associated with oak trees, and there's a lot of oak trees there, it's natural that there would be Armillaria throughout that area. And, so, really moving it doesn't change things. It may slow down the initial planting of what Armillaria you see. It may not. There have been cases where people have planting behind oak trees and had 50 to 60 percent of their trees die within three to four years from Armillaria, so -- but it's one thing that we're trying to do.

Q. If we could pull up 2.3, please.

If you look at what Mr. Steiner said here, how was this important to the opinions in this case that you're giving?

A. Again, this talks about how they can be distinguished. So, it says here that, "Trees infected with clitocybe" -- again, this is the same Armillaria as Armillaria tabescens now -- "are most easily distinguished from all other disorders by the presence of tough, sometimes leathery white mycelial fans or sheets which spread out between the bark and underlying wood of the roots and crown."

So you're going to see some of that same thing.

Q. All right. If we could look at 3.2. And explain to the jury why this reference to "infection centers" is important to your opinions.

A. Again, we're going to see areas where the fungus started and then it moves out, and so that's what we're talking about by "infection centers". Be like maybe just one tree gets it, but then that doesn't stay there; that fungus actually moves through root-to-root contact and moves throughout an entire orchard.

So, to read what this says specifically, it says, "Spreading the pathogen in this manner often results in development of pockets of several infected trees within an orchard. These infection centers gradually enlarge as the trees around their margins also become infected."

Again, that's what we have observed at Mr. Bader's farms also, and you'll see that as well.

Q. Okay. If we could go 3.1. Now, under, "Tree Stress Factors," and I believe Dr. Ford Baldwin may have testified about this. Tell us why this language is important to your opinions.

A. Well, what this says -- and I'll just read it first. Then I'll tell you what my opinion is on it. So we'll read it first.

Q. Read it slowly.

A. I will. I got this one down. I'm tracking with you now. "Under some conditions clitocybe and Armillaria appear to be aggressive pathogens capable of attacking and killing healthy, vigorously growing trees. For the most part,

however, they are weak pathogens which attack trees weakened by some stress factors."

There are two parts to that. And Steiner -- I'm not sure exactly what he meant with all of that, but in the very first part of that he says that Armillaria can attack and kill a vigorously growing tree. However, in the second part he seems to imply that Armillaria in peaches can be impacted by stress factors, okay, so that there's some kind of stress that predisposes the tree, and then it's attacked by Armillaria.

Now, this is from 1976, and what I'm going to tell you is, I disagree with him on this point. I think it's a good article, but things change over time. On this particular point I do not agree with him on that. Armillaria tabescens does not need a stress factor in order to attack a peach tree. You can have peach trees growing in beautiful conditions, manicured orchards that have no health stresses at all, and Armillaria tabescens will move through those orchards basically like a hot knife through butter. Okay. So it does not require a stress factor, so that's why I disagree with this article.

Q. All right. We can take that down, please. We're going to shift topics a little bit.

Where have you observed Armillaria at Bader Farms?

A. We've observed Armillaria throughout Bader Farms,

almost everywhere we've gone. There's only one orchard where I've not found it.

Q. Did you help prepare a slide for the benefit of the jury that will show where you identified Armillaria at Bader Farms?

A. Yes, I did.

Q. Call up Slide 7 just for the Court, counsel, and the witness, please.

Is this a slide that you prepared?

A. Yes, sir.

Q. Do you believe it would be helpful to the jury to see this slide in light of your testimony?

A. I do.

MR. DUKES: We would request to publish Slide 7 as a demonstrative, please.

MS. RANDLES: No objection.

THE COURT: You may.

Q. *(By Mr. Dukes)* Okay. Got Slide 7 up. Can you explain to the jury what they're seeing here.

A. Yes. And so you see those little dots are the circles before, and those circles are where we'd get out of the pick-up truck, I'd take a GPS reading, and that's going through all four years I was there.

The circles that we've taken off are when the trees are in the one to two-year range, and the reason I did that

is you're very unlikely to see Armillaria -- I didn't note Armillaria on one to two-year-old trees; the reason being is the roots have to find an old root piece in some of the soil with Armillaria in it. That usually takes at least two-plus years. Then when it does find it, it takes a while for the symptoms to develop, so I just wiped out all those. And I didn't see it in young trees. I wouldn't expect to. I never have seen it in young trees. It's going to take about the third year before you're going to start to see it. Maybe possibly the second year but almost always the third year, so that's why I took those out. So those are not in there. So we did remove those.

Everything else that's in red is where we noted that Armillaria tabescens, Armillaria root rot is present in those orchards. And, again, it's somewhere around -- it's not necessarily on that dot or on that red circle, but it is in that area and within those orchards, and so that's in red.

There's only one orchard, and you see that one in green where I did not find Armillaria in all the years I visited there. So that one orchard does not have it as far as I know now. Doesn't mean it doesn't have it, but we have not been able to identify it.

Q. And, remind me, how old does a peach tree need to be to be considered a mature peach tree?

A. For what I'm using on this graphic, I'm saying three years. It's not a fully mature tree, but mature enough that I can identify Armillaria, so that's what I'm calling it.

Q. Do you have an opinion as to whether the Armillaria was present in the soil that the young peach trees were in?

A. It's very likely that it's present in the soil. We can go back and look at Google Earth maps, and you can see where some of these young trees are planted, and you can see in older photos that Armillaria was present in those. So, if it was there before, it's still going to be there. It will come back in just that much quicker.

Q. Okay. We can take that down, please.

If you turn to Tab 4 in your notebook, it's what's been marked as Defendant's Exhibit M598.0070. And just let me know when you get there.

A. I'm there.

Q. Is this a picture of mycelial fans from Armillaria fungus you saw at Bader Farms?

A. It is an example of one of those in one tree, yes, it is.

Q. Is it a fair and accurate representation of what you saw at Bader Farms?

A. It is.

MR. DUKES: Your Honor, we would offer Defendant's Exhibit 598.0070 into evidence.

MS. RANDLES: No objection.

THE COURT: Admitted.

(Defendant's Exhibit No. 598.0070 admitted)

MR. DUKES: We'd request to publish it to the jury, please.

Q. (By Mr. Dukes) All right. Teaching time.

Dr. Brannen, tell the jury what you're showing them here from Bader Farms from your inspection.

A. Okay. So, I'm going to move over here for a little bit so I can talk -- oh, we had a pop-up. That's good. It showed up.

So I wanted you to see what we're looking at because that's not a great photograph from the standpoint of telling you what it is, but you can see now where the tree trunk is. So that's, again, going down to the crown. So this area right here, that's what I would call the crown. Again, that's where the soil line is, so that's what we're talking about, the crown.

Again, I would dig into the soil next to this peach tree and then take a shovel and scrape off bark. And then this right here, that is the white mycelial fan that is Armillaria root rot. Okay? That orange discoloration that you're seeing in that trunk, that's also not normal. That means that tree's dying. That means that tissue is dying. Normally that would be kind of a yellowish white, but when

you see that, that says the tree is on its way out. That's what we're talking about.

So, again, you've got that Armillaria -- the fan itself right there that was scraped off from the tree with a shovel, and so that tells you what we're looking for. That's my diagnostics on Armillaria for you.

Q. And in addition to physically cutting into the tree like you just described, did you take some samples to send off to be tested?

A. I did. And, again, if you look at that -- the bark with the Armillaria embedded in it, that's what we're talking about. I can take that bark, maybe from a tree like this I might take two samples, but from each tree I would take some bark with the Armillaria embedded in it. I do that in two years, and I put that in a ziplock bag, then double bag it. I always put two bags so I don't get ice water into the ziplock. I double bag it, mark with where the location is, what the sample is, put it on ice in a cooler and keep it on the cooler until we're ready to ship it off, and we overnight it FedEx to Clemson University for genetic analysis to tell us it's Armillaria tabescens. So that's what we did a few times.

Q. Who did you ship it to at Clemson University?

A. Dr. Guido Schnabel is a resource for the Armillaria testing at Clemson University. He's a professor of plant

pathology there at Clemson University. He's worked on Armillaria.

Q. Does he actually test the DNA?

A. He does. He tests the DNA, and then that allows him, based on differences in the DNA, to tell what the actual species is of the fungus we're looking. So, if it was Armillaria mellea or another Armillaria or another fungus, he could tell you that. But he's able to definitively identify it as Armillaria tabescens, and so that's why I wanted to do that. Again, this is good enough. I mean if you did this day in and day out, you knew what Armillaria looks like, you all could do this. I could take you out in 30 minutes and train you how to do it and you'd be good at it. So it's not that tough. But for a court case or something where you want a definitive answer on the species, this is what you want to do.

Q. You had suggested that we consider taking the jury in a van on a field trip with shovels but we're in the third week of what we thought might be a two-week trial, so I vetoed that.

A. I'll take anybody who wants go. So we can ask for volunteers.

Q. All right. Now, what is Armillaria doing to the mature peach trees at Bader Farms?

A. Again, it's killing those trees outright.

Q. Is there a specific pattern of tree death that you observed at Bader Farms?

A. There is. Again, when you walk into it from the ground, sometimes it's hard to discern what exactly's going on, but it's a somewhat circular pattern. But when you look at it from above, like with an aerial photograph or satellite imagery, it looks like somebody took a shotgun and hit the orchard. So you got pockets throughout the orchard where the fungus has started, and then sometimes they grow together. But that's what it looks like, so that's what you're seeing.

Q. If we could take this slide down. Turn to Tab 5 in your notebook that's marked as Defendant's Exhibit M598.0038. You there?

A. I'm there.

Q. Is this a photo of a peach tree field that you took when you were at Bader Farms?

A. It is.

Q. And it's representative of what you saw when you were there, correct?

A. Yes, sir, it is.

MR. DUKES: Your Honor, we would move Defendant's Exhibit M598.0038 into evidence.

MS. RANDLES: No objection.

THE COURT: Admitted.

(Defendant's Exhibit No. M598.0038 admitted)

MR. DUKES: And ask that it be published, please.

Q. (By Mr. Dukes) Now, tell the jury what this photo shows.

A. So, in looking at this photo you see -- well, here and here, these are some of those trees that Mr. Mitchem talked about that had been cut off, so that's where Armillaria had killed a tree. They go in there and they cut -- they still leave the stump, but that's where it's cut off.

You can see in the background here, this is a tree that has either just died or is in the process of dying from Armillaria. But, more importantly, you see this big area all around here where all those trees are dead. Well, that's Armillaria, so that's where it started and moved out, and it's killed all those trees. That's a pretty good portion of that particular block when you look at it, so a lot of dead trees.

And I'll point out, too, that -- I don't know the exact age on these trees, but those trees are not that old, so they haven't been planted that long and they're already dying, already dead. So, that's what Armillaria does.

Q. Is this photo consistent with the infection center that you discussed from the Steiner article?

A. It is. It is. This is what you'd expect to see. This is what I see anywhere where Armillaria goes into a

peach orchard.

Q. Okay. Now, we can take that down, please.

Have you looked at historical satellite photos of some of the peach orchards at Bader Farms?

A. I have.

Q. And if you would turn to Tab 6 in your notebook, please. This is marked as Defendant's Exhibit MM530.

A. I'm there.

Q. Is this a collection of satellite photos of the orchards surrounding the packing shed at Bader Farms?

A. It is.

Q. And how did you get these satellite photos?

A. Again, this is all through Google Earth.

Q. And do these satellite photos accurately represent what you saw during your inspections at Bader Farms?

A. Yes, they do. The historical images reflect what I saw of that farm, yes.

MR. DUKES: Your Honor, we would move 530 into evidence.

MS. RANDLES: No objection.

THE COURT: Admitted.

(Defendant's Exhibit No. MM530 admitted)

MR. DUKES: And request to publish to the jury.

Q. *(By Mr. Dukes)* Let's pull up slide 80 first, please.

Now, dates are going to be important here for a while,

okay? So, what's the date of this photograph?

A. Again, this is March 9th, 1996.

Q. And tell the jury what's being depicted here in this photograph in 1996.

A. If you look at this -- and, again, it's a black and white, but I hope you all can see that well enough so you'll understand what I'm saying. But this is the orchard -- this orchard that's -- here's the packing shed. When we're talking about the packing shed, that's the packing shed. So that's basically I think where Mr. Bader's office and everything is run out of that packing shed.

And then there's this big orchard here and then there's a little, kind of a rectangular orchard there. I'm going to be going back to those as we go through these photographs. So this orchard was planted in 1994, so those trees now are about two years old.

Q. You misspoke. 1996.

A. This is 1996. They were planted in 1994.

Q. Right, exactly. Sorry.

A. They were planted in 1994; this is 1996. They were planted in 1994, 1996, and so these trees are now two years old. And everything right now within those blocks overall looks pretty uniform, okay? So they're about two years old, all right?

Q. So you don't see any evidence of Armillaria tree death

from this photo; is that right?
A. Not within those blocks. If you look at some of the other blocks, it's hard to see on the black and white. I could pick out some but I'm not going to try to show that to the jury.
Q. Let's call up Slide No. 9. Now, explain to the jury what you're showing them here.
A. Okay. Now, again, this is the same orchard, same basic view that you're seeing. Now, this is on December 30th, 2003, I think is what it says here. Again, here's the packing shed. And then, of course, you see the larger orchard. And this one right here, kind of rectangle.

And what you're seeing here -- and I think you can see that visually on your screen. There's a lot of pockets. You can look throughout all those orchards. There's suddenly just a lot of pockets of dead trees, and that's a relatively short period of time for a peach orchard. Peach orchards should last, healthy, at least 15 years. And, again, you know, this one was planted in '94, so it's not quite ten years, and yet, you've got that kind of death and decline.

If you looked in this one, this little rectangular area, there's this really obvious area where it's just dead. Now, you can see that also throughout here. Now, you can also observe, if you look at it, there are some low spots.

I know Mr. Bader did mention some low spots. I'm going to talk about that again. And there's some in there, and those trees are not doing well in the low spots. They don't do well in low spots. They don't like wet feet, as they said. And so that's not necessarily Armillaria. Armillaria also does better in a wetter area, too, so you can't necessarily rule it out. But, nonetheless, we'll talk about that a little bit more, too. But I want you to see how much dead trees you have, or how many dead trees you had, and that was in 2003. And look at the pattern, okay? So get that in your mind, all right? Thank you.

Q. Now, if we go to Slide 10.

All right. Tell the jury the date of this photo and explain why this is important to your opinions and what they're seeing here.

A. Again, so this is August 8 -- August 18th of 2005. Okay, so, again, just a little over ten years. We're looking at some of the same stuff. Look at this little rectangular block and then look at this block here. Again, here's the packing shed right there. That's your packing shed. And just look at the amount of death that's occurred in that timeframe. I mean that's a little over a ten-year period, and I would estimate -- again, I'm eyeballing it, but probably in the large orchard to the north there, that's probably at least 50 percent of those trees are dead. And

when you look at that rectangular orchard, it's probably more like 80 percent in a ten-year period. Okay. So, that's a rapid tree death. That's not normal for a peach tree.

Q. Dr. Brannen, this was taken August 18, 2005. So, is it fair to say that this was ten years before any Xtend seeds were available to be sold on the market?

A. Best of my understanding, that's correct. That is correct.

Q. Is it your understanding that the cottonseed was available during the planting season in 2015, the Xtend seed?

A. That's what has been testified to, that's correct.

Q. And then the Xtend soybean seed was available on the market in planting season 2016, correct?

A. That is correct.

Q. Okay. Now, let's take a look at Slide 11. And explain to the jury what you're showing here in Slide 11.

A. Okay. Again, you see what's starting to happen here. Well, you can see -- like some of these blocks have already been ripped up and they're starting to be replanted. Here's our rectangular block. It's actually -- I don't know if it's replanted here. I assume it is. It must be. It was replanted in 2007. So I don't know if you can see that. Baby trees in there because it's replanted in 2007.

Here's your packing shed right there. But, again, here's our big orchard up here, now you can see the death is much more extensive. I mean you're at least 50 percent of those trees, maybe more like 60 percent. It's hard to predict, but we know that the one that's in the rectangular area had to be replanted already. Again, that's an abnormally short rotation on a peach tree. I'm telling you that's related to Armillaria. That's what Armillaria does.

Q. Could we take a look at Slide 12, please. And we've now moved the August 12, 2009. Would you explain to the jury what you're showing them here and why it's important to your opinions.

A. Again, let's look at this rectangular block. You can see the trees now. Not really seeing a whole lot yet. These are about two-year-old trees, which is, again -- that's what I'd expect. But when you're looking at that larger block, this block up here right by the packing shed, here you're probably at least 80 percent mortality. That's just -- most of those trees are dead. And, again, that's still not considered a normal productivity for a peach orchard. It's getting close to where you want to be, but most of them are dead, so you're getting closer to 15 years. But, nonetheless, there's a lot of mortality there.

Q. In 2009, we're still roughly six years before any Xtend seed can be sold on the market, correct?

A. That is correct.
Q. If we could pull up Slide 13, please. And this is dated October 6, 2010. Would you explain to the jury what you're showing them here and why it's important to your opinions.
A. All right. Again, looking at that rectangular field, you can start to see now -- you see these little pockets forming in here? You see those trees are dying? That's a pretty rapid death. Again, that was planted in 2007. This is year three, and you can already see -- if you look throughout that block, you can see quite a few trees are dead. That's what you expect, Armillaria root rot. Those trees that were left where the roots were left in the soil from the previous planting, it's just going to make it that much faster, and so that's typical.

And, again, you still got that large block up there above, but I think it's going to be ripped out in 2010 actually, so that's the date that was provided for us. It was actually ripped out in 2010. But you can see how decimated it is at this point.
Q. If we could call up Slide 14, please.
A. I guess I could just leave my rectangle. It looks like it would be the same spot. But, anyway, again --
Q. Lets me ask you a question. Okay. So we've now moved to February 29, 2012. What are you showing the jury here?

A. Okay. Again, you're looking at that small rectangle. You see there's more and more death. You see this area here. You got little pockets here and there. And then this larger orchard has now been replanted, and you can see -- if you look at it, you can see, this is a low area right here. You can see some of the low areas. There's some little low areas that are -- or you can actually pick up in there, but that's been replanted. So I want you to understand what the difference is between low areas and then areas where the Armillaria is, okay?

Q. All right. If we could pull up Slide 15, please. This is slide dated February 26, 2014. And would you explain to the jury what you're showing here?

A. Again, same orchards. Here's your replant from 2007, and you can really see how this is grown out now. See these pockets? Look at all the dead trees in here. I don't think I have to really point it out to you. It's pretty obvious you've lost a lot of trees by 2014 in that orchard. And, again, that's only a seven-year-old orchard, so that's a very, very young orchard.

And then above you see the new replant that was in 2014 of the other trees, so that's when they were planted, or had been planted, previously planted. And they're growing out, too. But you can't get -- you can see a little bit of the pocket starting to pick up, but it's not as

obvious. Again, you got to give it a little bit of time.
Q. Now, so far, all the photos that you've discussed with the jury have been before the 2015 planting season, so they're before any Xtend seed is on the market. Is that your understanding?
A. That is correct. That is correct.
Q. Let's take a look at Slide 16. And tell the jury what you're showing here.
A. Again, this is 2015, obviously, and here's that block. I mean you've probably lost maybe 40, 50 percent of your trees already from that. And then the other thing, you look at this large block up here now, and you've already got a tremendous amount of loss on those trees. Those are planted probably around 2011, I think is right. It's either 2011 or 2012. And, so, with that block of trees, you've already lost a huge number of trees. And so that, again, is representative of what Armillaria's doing at Bader Farms. And it didn't just start doing it today; it's been doing it for years and years and years. This is nothing that hasn't been there. I don't know if it's been identified as a problem for them, but there's nothing new about Armillaria root rot in that farm.
Q. And is there a specific pattern that you can point out to the jury as far as the tree death?
A. Again, it looks like you took a shotgun to it at this

point, but you can really see -- and we're going to see this a little bit more in a minute, but you can see that big open circle, and all in there, there are lost trees, and all through here, too. You can see all these trees that are being lost. There's just a lot of them. Usually it starts again as a pocket and moves out, and those kind of all grow together at some point, but that's what you're seeing.

Q. We can take that down, please.

Now, Dr. Brannen, you've been in the courtroom for several days. You've seen a lot of testimony in trial, correct?

A. I have.

Q. And do you recall Mr. Bader testifying about two aerial drone videos with Bader Farms?

A. Yes, sir, I do.

Q. Were you able to make some of your own observations based on those videos?

A. Yes, sir.

MR. DUKES: Okay. Your Honor, these are in evidence as Plaintiffs' Exhibit 2116, the videos.

Q. (By Mr. Dukes) Let's take a look at the first video. I'm going to stop it periodically and let you comment on it, okay?

A. Yes, sir.

Q. All right. Let's call up Slide 17, please. And it's

going to have two sessions to it.

Now, can you please tell the jury what you're showing here and why it's important from these videos.

(Playing videotape, Plaintiff's Exhibit 2116, for the jury)

A. So that's that same larger field you all have been looking at. This is in 2018, if I'm not mistaken. And you can look down, you can see Armillaria pockets. You can also see some lower areas also, and I've talked about that. And we'll -- I'll point those out to you in a second. There's the packing shed right there in the lower right-hand corner.

Q. All right. If we could play the second part of this one slide, please. What are we seeing here?

A. Again, you see that lower area that you talked about, but it's not all low. Then you look back here. This is that rectangular patch that's right behind -- I think I can show it here like this, too. But you see that? That's that huge loss that we were talking about in that rectangular section that we had seen previously. So you saw it in the first planting, you see it in the second planting, and here with this drone you can see what it really looks like. So you can see all these trees that are in the process of dying. You see some of these little -- like I'm -- these trees right here, you can see some of those are dying. You can see the ones that are left in that circle. They don't

know it, but they're dead. It's just a matter of time now.
Q. Okay. We can take that down. I always hate to go backwards, and I won't do it often, but I'd like to go back to Slide 15 for you to illustrate something. If we can pull up Slide 15.

Now, this is a still photo dated February 26, 2014, that you had mentioned earlier. What does this show in relation to the video that we just saw?

A. Again, if you look in behind here, there's the packing shed. You look behind here and you start looking in here, that's that open area that we're looking at in the video. So, that's the same area. And, again, it's just keeping expanding and expanding more and more.

Q. And that's in 2014, before any Xtend seed was able to be sold on the market, correct?

A. Oh, absolutely. All these photographs are before. All these Google Earth photographs, before that.

Q. If we could call up Slide 18, please. We're moving forward. We're going back to the drone video, and would you tell the jury what you're showing them here and why it's important.

A. Okay. So this is looking back towards the packing shed. And here you see, again, some of these areas with death in the -- you can see multiple pockets, and these are not in those low areas. You remember the low area's over

here, so that is a -- that's kind of like a stream bed or something like that. You don't see any trees there, but then you see all these pockets here. See a pocket here, a pocket here, a pocket here, here, here. All of that's where Armillaria has been killing those trees, so that's what I expect to see.

On my first visit I got out of the truck, wandered around there. That's where I first saw Armillaria is over there in that orchard across the road, so it's not far. There's a lot of Armillaria in all those trees over there, too, but that's where I first identified it. It didn't take me more than about a half-hour before figured out that Armillaria was killing trees.

Q. We could call up Slide 20, please. And explain to the jury what you're showing here from the drone video.

A. That's the same one we just saw.

Q. Well, then, why don't we call up --

A. I think we skipped one, maybe two.

Q. Why don't we call up Slide 21. How about that? Tell the jury what you're showing here.

A. Just like groundhog day. All right. So, here, as you're going up, this is, again, an Armillaria hot spot. And this is a classic as far as Armillaria because, again, if you look at these trees here, look at that tree and that tree, you can kind of see those are yellowed out and bronzed

out. They're starting to die or dying. You got a tree over here that just died. There's some right there, there. So, and you got all -- the stumps where the trees have already died. You can kind of pick up this pattern that you're seeing. That's what I'm talking about by a circular pattern.

I like this video because it allows me to show all those things to you. And I could tell you that if I was picking a tree to go with a shovel, you don't want a dead tree; you want a tree that's in the process of dying. So one of these that I picked out had that kind of yellow discoloration. I'd rather have a few where the scaffold limbs are dead. That's the kind of tree you'd want to pick out.

Q. Now, we could go on and show other orchards. I mean you saw Armillaria root rot in orchards beyond this one, correct?

A. I did. I did.

Q. We chose to use this for illustrative purposes so we wouldn't go on and on?

A. That's correct.

Q. Now, during the course of your inspections, you've seen evidence of Armillaria below the ground at Bader Farms, correct?

A. Yes, sir.

Q. You've seen evidence of Armillaria at Bader Farms at the ground level, correct?

A. Yes, sir.

Q. And you've seen evidence of Armillaria looking down from a drone onto Bader Farms, correct?

A. Yes, I have.

Q. Have you seen clear evidence that Armillaria root rot has been killing peach trees at Bader Farms for at least a decade before Xtend seeds were ever able to be sold on the market?

A. Yes, sir, I have.

Q. Is there any doubt in your mind about that?

A. There's absolutely no doubt in my mind that's what that is.

Q. Have all the opinions that you testified to today been given to a reasonable degree of scientific certainty?

A. Yes, sir.

Q. Were you sitting in the back of the courtroom when Dr. Ford Baldwin testified on Thursday and Friday?

A. I was.

Q. Do you recall Thursday afternoon Mr. Miller asked Dr. Baldwin:

"Q. Now, you agree that Armillaria is present in Bader Farms, correct, Dr. Baldwin?

"A. Yeah. I don't deny that."

Do you remember that?

A. I do remember that, yes, sir.

Q. You remember Friday morning when Mr. Anderson was cross-examining Dr. Baldwin and asked the question:

"Q. Armillaria tabescens is present at Bader Farms, isn't it?

"A. It is present at Bader Farms, yes."

You remember that?

A. I do remember that, yes, sir.

MR. DUKES: Dr. Brannen, those are all the questions I have right now. Thank you very much.

MR. ANDERSON: No questions, Your Honor.

CROSS-EXAMINATION

QUESTIONS BY MS. RANDLES:

Q. Good afternoon, Dr. Brannen.

A. Good afternoon.

Q. Dr. Brannen, we have met on numerous occasions, correct?

A. We have.

Q. You and I have been at Bader Farms at the same time when you all were conducting inspections, correct?

A. Yes, ma'am. You seen me sweat at Bader Farms, yeah.

Q. And I also deposed you back in the summer, correct?

A. You did.

Q. I want to ask you just some follow-up questions with

respect to the kinds of things you were talking about with Mr. Dukes. Is that all right?

A. That's fine.

Q. All right. So you testified you're a plant pathologist, correct?

A. That is correct.

Q. And you don't know a whole lot about dicamba, correct?

A. No. That's not my area of expertise, no.

Q. And you've never done any studies on dicamba, correct?

A. I have not.

Q. You do know that a herbicide will stress a tree though, correct?

A. I agree with that.

Q. And you know that dicamba will stress a tree, correct?

A. My assumption is it would. I don't have any direct walking around knowledge that it would, but I assume it would, yes.

Q. And, so, you're not an expert, you said, on herbicide injury to peach trees or any other plant, correct?

A. No, I'm not an expert. I would say, again, that I have the ability to do diagnostics. And, so, if I see something that looks like a herbicide injury, I'm at least able to identify those types of things, but at that point I would always refer to a weed scientist for additional input.

Q. And you've never diagnosed dicamba injury on any plant

before, have you?
A. I've not diagnosed it on plants. Just like when Mr. Mitchem, I've seen dicamba on peach trees before in research trials. You mentioned some of the trials that Georgia had. I've seen those trials. I've actually seen the injury that it does and so I know what it looks like.
Q. Okay. And, so, you don't have any experience with dicamba with respect to its volatility, any of that research?
A. I do not.
Q. And what about drift, either vapor drift or physical drift, you don't have any knowledge or expertise in that?
A. Well, I mean it's not my area of expertise. I've seen drift of herbicides before, I've observed drift, but I don't -- it's not my area of expertise to talk about it if that makes sense.
Q. You understand that there's physical drift and vapor drift, correct?
A. Based on the testimony that's been given, it seems there's two different kinds of things that are being addressed. Again, it's not my area. I won't testify one way or the other.
Q. And, understand, I'm just trying to make sure everything is clear.
A. Right.

Q. And -- but you would agree that Dr. Baldwin is qualified to make conclusions about what's happening at Bader Farms, correct?
A. I agree he has the background as far as his weed science credentials. He has very excellent weed science credentials, so he can make conclusions. I just disagree with his conclusions, I guess is what you'd say.
Q. And you don't have any idea what dicamba does to a plant at the cellular level, correct?
A. Not exactly, no. I mean I know it's an auxin mimicking type of herbicide, but when it gets to that level of physiological type stuff, I would not be in any way capable of commenting on that.
Q. And you're not at all familiar with the growing body of research on the effects of dicamba on sensitive plants, correct?
A. No, ma'am.
Q. You don't have any knowledge of any research results on the effect of multiple exposures of dicamba on sensitive plants, correct?
A. I'm not aware of any, but as far as I know, there's nothing out there. If there is, I'm not aware of it.
Q. And I'm not meaning just with respect to peach trees. I mean anything. You're not familiar with the growing research on the effect of multiple exposures of dicamba on

sensitive plants?

A. I am not.

Q. So is the sum total of your experience -- I'm sorry. Strike that.

Is the sum total of your knowledge about the research on dicamba with sensitive plants, is that the Prostko and Bradley studies we've been talking about earlier today?

A. No. I mean there's another study that Mr. Mitchem did in Georgia as well, so I've reviewed that study, the Prostko study, and I've read the Dentelman article and looked at some of his slide sets, stuff like that, and talked to some of those folks.

Q. And Dentelman, that's the same one as Kevin Bradley?

A. It's his graduate student who did the work.

Q. I don't want to replow this ground, no pun intended, but -- because we covered it a lot in your deposition, but I do just want to ask, since the jury is here: We talked a lot in your deposition about the differences between Southeast Missouri and Georgia, correct?

A. We did.

Q. And you would agree that Southeast Missouri, the Bootheel in particular, has some different cropping systems than Georgia, correct?

A. If you're referring to like soybeans and cotton?

Q. Yes, sir.

A. Really it does, it does, it does. And we do have soybeans and cotton, we do have especially cotton planted near some peach orchards, but we don't have nearly the soybeans that you guys do.
Q. But you all don't have that much in the way of soybeans throughout the whole State of Georgia?
A. No, we do not, not by comparison. We plowed that ground already.
Q. And I promise you this is not a pop quiz, but can you name for me the top peach producing counties in Georgia?
A. I think I can. Macon, Crawford, Peach -- Macon, Crawford, Peach. And then there's one more I'm trying to think of. But, anyway, there's four of them right there together.
Q. Is Taylor one of them?
A. Taylor. That's it. That's it, right.
Q. And are you aware that in 2018, only Peach County produced any soybeans in Georgia, of the top ten peach producing counties, only Peach produced any soybean?
A. I'm not aware one way or the other on that. I don't know anything about that.
Q. Only 2200 acres, does that sound familiar at all?
A. It's possible. I would not refute it.
Q. Are you also aware that only Macon County grew cotton in 2018 in Georgia? Of the top ten peach producing

counties, only Macon --
A. I'm not aware of it, but, again, if you want to show me that, that's fine, but, otherwise, I'm not going to argue about those things at all.
Q. Like I said, we talked about this quite a bit in your deposition, so I'm not --
A. We went round and round on that one.
Q. Have you read -- I believe you said you've read the label for the XtendiMax with VaporGrip?
A. At some points I have read parts of the label. I have not read the label in a long time, so -- I didn't read the label preparing for this trial, I'll put it that way.
Q. Do you recall that the label says that all fruit trees are sensitive to dicamba?
A. I don't recall that, but, again, it would not surprise me if you're telling me that's what the label says.
Q. It does. But I kind of --
A. Do you have a copy of the label where it says that?
Q. I'm sure we could pull it up, but if -- just take my word for it, it says that on there.
A. Okay.
Q. If you want to see it, I can show it to you.
A. Well, it make sense the fruit trees would be sensitive to it, to me.
Q. So I want to get your Power Point presentation here.

We can go to page -- I believe it's page 4.? Yes. And you have here listing -- you've listed other factors that -- and I apologize, I don't remember what exhibit this is. But other factors causing peach tree stress and mortality at Bader Farms. And it's now popped up on the screen.

So you've got listed, what, 12 or 13 different things here?

A. Quite a few of them, yeah. I think so. Thirteen I think is right.

MS. RANDLES: Could we publish it to the jury as well?

MR. DUKES: No objection, Your Honor.

Q. *(By Ms. Randles)* Okay. Sorry, doctor.

A. I think it's 13 is what I'm counting.

Q. I'm not going to go through all of these but I do want to talk to you about a few of these. I'll do it in brief here and then ask you some more questions about it.

A. Okay.

Q. Let's start with the first one: Improper planting depth in young trees. That's the very first one there. Now, you've testified, and I believe Mr. Mitchem's testimony also was that Mr. Bader is not planting his trees properly, correct?

A. Correct.

Q. But in all of the photos that we've seen, the aerial photos that you showed, we can look at the peach production,

it seems that Mr. Bader always has trees in production, correct?

A. He does, but what we don't see in those aerial photos that I showed you, there's some of those orchards where we visited that most, if not all, the trees were dead, the young trees. And so, you know, it's not a hundred percent. I'm not saying that. It's just one of the things that's there. So there's some orchards where you do have death due to improper planting depth.

Q. So, I understand that you're not saying that every single tree was dead in those young orchards. But the question though is that you are saying that Mr. Bader has his trees now that you've seen are improperly planted, correct?

A. The ones that we've seen that are young trees where I could check that, I'd say they're improperly planted, yes.

Q. Okay. But Mr. Bader has been planting trees in his orchard since sometime in the early 1980s. I would think even before that, but certainly after he acquired Bader Farms in the eighties, he has been planting trees that whole time, correct?

A. Yes.

Q. So those trees apparently have been viable and have been living and producing trees, correct?

A. They have.

Q. And we can look at the yield history for 2002 through I guess 2019, but certainly 2002 to 2014. We've got a demonstrative there that shows his peach production, correct?

A. You do.

Q. And, so, if Mr. Bader has been planting trees all along, how would you assume that he's suddenly forgotten how to plant trees?

A. We just have a disagreement on how you plant a tree, and so that's how we say it. And, so, Mr. Bader is using -- he said this in his deposition: He plants at the ground line. I think in one case he said he might plant an inch above the ground line. But you shouldn't plant at the ground line. That's one of those things. I respect Mr. Bader, but if I was advising him -- I advise Georgia producers on this, too.

And, by the way, some Georgia producers do plant their trees too deep. They've had the same problem. They've had -- some of their trees have died. But I what I advise people to do is use the same planting depth they came from the nurseries is where these plant them. So always use the same ground line, whatever the ground line was from the nursery, you use that as your ground line when planting. When you don't do that and you put them in -- and let's say you do put them in like Mr. Bader said, and you put the

grafting in at the ground line or just above the ground line, you've already planted them at least three to four inches too deep. And then if you get a rain after that and it sucks them down a little bit more, then they're really too deep, and that's often time when you get in trouble.

Q. And I understand that, and I appreciate your answer. So my question though is that if Mr. Bader has been planting trees since -- let's just say the 1980s, okay?

A. Right.

Q. And his trees have been living, clearly, correct?

A. They have, yes. They have lived and they will live. I'm not saying it's going to kill trees every time. It will always stress trees. I'll make a flat statement: When you plant them at the ground line, it will always stress the trees. But if you get certain conditions, especially if it rains a lot, along with them being planted too deep, then you don't have enough oxygen in the root zone, and that's when they die en mass and that's -- again, I haven't observed it every time. But they will come back. If they're planted at the ground line, the roots will actually move back up or put on new roots, and you can overcome that. It can also wipe out a block. And I've seen that in Georgia at least two or three times. We had one of our producers who consistently did that. About two or three years ago he

lost just about every tree he planted that year because he did that. He said he would not do it again.

Q. All right. And I think that's interesting, but my question is still: If Mr. Bader has been planting trees the same way for decades, it doesn't make any sense that the trees would suddenly be dying, as you are -- you're theorizing from his inadequate, poor planting?

A. It doesn't happen every time, that's what I'm saying. You'll get away with it for a lot of the time.

Q. Have you read the testimony in this case, deposition testimony where Mr. Bader talked about the tree planting?

A. Yes, ma'am, I have.

Q. And so you are aware then that they have mechanisms and procedures in place to account for if there is a rain and someone goes back through and checks on the trees?

A. I did read that.

Q. Okay. So they've been doing this the same way for decades, correct?

A. They have. But, again, if you pull it back up to the -- where the graft union is still at the ground line, even if it rains and you pull it up back up, it's still planted too deep. That's what I'm saying.

Q. I understand what you're saying. What I'm saying is it makes no sense that Mr. Bader has been doing this the same way for decades, and extraordinarily successful. What

you're saying now is all of a sudden his procedures for planting are woefully inadequate?

A. Again, let me restate what I'm saying for you. What I'm saying is, his method -- he's not going lose trees every time with what he's doing right now, but if you get into a wet situation in particular, then you'll have low oxygen root zone, and you can lose trees. We didn't see him losing every orchard that he planted, so that's not what I'm saying. I'm talking about on the new plantings. But when we did see like trees dying en mass and sometimes showing some of the symptoms that were purported to us as being dicamba, it wasn't that; it was the trees were dying because they were planted too deep.

Q. But Mr. -- I'm sorry, not Mr.; Dr. Brannen.

A. That's okay.

Q. It is -- it still, I think, defies logic that all of these young tree deaths would coincide with the release of the Xtend system. Wouldn't you agree with that?

A. Well, I don't know that because, again, I wasn't here in 2004 or 2005, so I don't know if he's lost trees before to planting depth issues, I mean, so I can't testify to that one way or the other.

Q. He's testified that planting depths is not an issue before, and he doesn't believe it is now. So, based on that, it would have to be a miraculous coincidence that all

of a sudden Bill Bader has forgotten how to plant trees?
A. I think the way he's been planting them all the time -- if he's been planting them that way, that would be incorrect. I would advise him to do it a different way, I'll put it that way. So that would not change.
Q. Let's -- I just want to ask you about -- let's go all the way down to the next to the last one from the bottom, this farm implement damage one. I asked you about injury to trees extensively in your deposition?
A. You did.
Q. And, as I recall, you would not admit that me walking up to a tree and hitting it repeatedly with a hatchet or machete -- I can't remember which one I said, but you wouldn't admit that that would cause injury and stress to a tree. Now, here, we've got farm implement damage here from, you know, a mower. And I don't understand how this would injury would be different than me walking up to a tree, hitting it with a machete.
A. No. I mean -- and let me clarify. I think I also said that if I was a tree, I wouldn't want to get hit with an ax or machete either. I mean, so the damage is not a good thing for a tree. So if you hit something and put damage in there -- I think we were talking about stress in particular. So you were asking me if it stressed the tree and I said I don't know that it stresses the tree because

the tree may heal from it just fine. If the tree heals from it, it may not cause significant stress to the tree. It is a damage point, and if you get damage on a tree like that, then you can get various canker diseases like leucostoma, cytospora, and these other fungal diseases that would come in on that, botryosphaeria, too. Those are organisms that will come in on damage tissue and cause a canker, and that will weaken the tree, and so that -- it can kill the tree out right.

Q. I'm sorry. But your title here is, "Other Factors Causing Peach Tree Stress and Mortality." So I specifically spent an inordinate amount of time asking you whether or not hitting a tree with an ax or a machete or hatchet would cause the tree stress, and you were unwilling to admit that.

Now here we have farm implement damage as one of the sundry causes of the damage that's occurring at Bader Farms?

A. It is, but I'm also referring to it as mortality as well, so it's stress and mortality. Maybe I should have said "stress or mortality." But in this case it is actually damage that can allow another pathogen to come this there, and that's what I'm referencing.

Q. But you do admit that herbicide injury to a tree can cause the tree to be stressed, correct?

A. Yes, ma'am, herbicide injury can cause a stress to a tree.

Q. And herbicide injury can also -- like other stress of a tree, herbicide injury can cause that tree to be susceptible to many other things, correct?

A. Well, that's an area I'm not familiar with. I'm not comfortable testifying about this one way or the other. You have to look at the particular herbicide, what the interaction is you're looking at, and so that would require research. And, I don't know. I'm not an expert in herbicides, so I couldn't tell that you. And I don't know of any research that's been done in that area. May have been research done. I'm just not familiar with that research.

Q. There has been research done in the area of herbicide interaction and how it causes additional stress to a tree. But your testimony is, you're not familiar with that with respect to any plant; is that correct?

A. I am not, no.

Q. Would it surprise you to know that Dr. Baldwin is very familiar with that?

MR. DUKES: Objection. Beyond the scope. He's been very clear that he's not here to testify about herbicides, and we intentionally didn't discuss that on direct.

THE COURT: I'll overrule it for now.

Q. *(By Ms. Randles)* Now, Dr. Brannen, you said, during Mr. Dukes's examination of you, you were -- think you

described yourself as a mud-on-the-boots kind of professor or something like that?

A. That's one way to describe it, yeah.

Q. So I guess if you're out with farmers -- are you out with farmers who are -- say they've been in the business for decades. When you're out, are you out talking to farmers who have been doing -- whether it's orchard management or what-have-you, are you talking to them?

A. I am. Especially in peach production, you've got farmers that have been in existence for over a hundred years.

Q. And, so, if -- when you encounter someone who's been in the business for decades, there is a certain level of respect that you have for that person, correct?

A. Oh, yes, ma'am.

Q. And they've been in the business for decades because they obviously know what they're doing, correct?

A. They do know what they're doing to some degree, for sure, yes, ma'am.

Q. If they've been able to survive -- you would admit that farming is a tough business?

A. Yes, ma'am. Farming is a tough business.

Q. And, so, if someone has been able to survive in the industry for 50 years, they've got to be doing something right, correct?

A. They've got to be doing something right, but they could also be doing something wrong.
Q. -- something wrong, right?
A. Yeah, but what I'm getting at is, even those farmers -- and, again, you have to be respectful. You understand what I mean by that. If I go into a farmer's facility, a peach grower's facility, and I tell him, *look, you know, you're doing this wrong, I think you need to correct that,* I have to be careful about how I approach that, obviously. But just because they've been farming peaches for a hundred years or however long in their family, it doesn't mean we can't teach them something new. So we generally learn from each other. I'd say it's a two-way street. I'll listen to them. They tell me what their problems are, and then I try to solve those problems. That's how it often works. But, also, they're -- we're always learning. And part of my job is to take the information that I learn -- I may learn it somewhere else and bring it back to them, so they can learn from even me.
Q. Okay. So when you said, "we are always learning," you mean you and farmers, correct?
A. Yes, that's correct. All of us are.
Q. Okay. So just because something is not within your playbook about how to do things doesn't mean it's incorrect, right?

A. I'm not always right either, but generally I know within the pathology area on peaches, I'm pretty well-versed in what should be done.
Q. Well, that's not actually an answer to my question. My question is: Just because it's not in your playbook doesn't mean it's incorrect, right?
A. That would be a good -- yes, I agree with that. Because, again, I can be wrong, too, so that's true.
Q. And I just want you to clarify something for the jury because I thought that you said, when you were inspecting Bader Farms, that Mr. Bader took you all to all the orchards that he wanted you to see. I think that's what you said. Is that right?
A. Well, the ones in which -- you know, he led us or somebody -- you all led us, or he led us. Somebody led us.
Q. But Mr. Bader wasn't choosing which orchards you can see and which you weren't; you all were permitted to see the entire orchard, correct?
A. Well, sometimes we were not able to see all the orchards. The first visit in particular, we just didn't have time. You know, we were limited in our time, and we also looked at other things other than peaches for a period of time as well. On the other visits we were also limited by our time. When I say limited by the time, there was, I guess, some type of agreement in place for how long we could

be there, as far as I know, but I think we saw every orchard that he had, again, that he wanted us to see. The only ones that -- I think there were some off-site orchards somewhere, I think that's true, that we didn't see, but I don't know that. Is that not true? Did we see all the orchards?

Q. Any orchard -- I mean I can tell you any orchard that defense counsel wanted you all to see, you saw. So I think your testimony is that you do believe you saw all the orchards, correct?

A. Again, not in the first visit.

Q. No. But I mean over the subsequent --

A. Yes, yes. I think we've covered them all.

Q. And, so, during -- just so the jury has an understanding of what these inspections were like, during these inspections you all weren't sort of running from this orchard and then spending an hour in an orchard, two hours in an orchard, and then going over to the next, correct?

A. In some cases we probably spent at least -- I don't know. Sometimes we probably spent 45 minutes in an orchard. Some of them are big. We spent an hour in some of them. So I mean on the first visit we saw eight peach orchards; on the second visit we saw 32; and then on the third and fourth, I think each time we saw 27. I don't know how that worked out. I guess pushed up or something. But, anyhow, that's a lot of orchards in two days, and some of those are

hundreds of acres. So we did spend a lot of time on the ground at some sites.

Q. That's my point though. Recall, I was there for the vast majority of those inspections.

A. Yes, ma'am.

Q. And, so, we would then have to get in the car and drive to the next orchard, correct?

A. Yes.

Q. Then there was a set-up process and determine where you all were going to inspect, correct?

A. Yes, ma'am.

Q. And then there were some various discussions among you all as we're standing at trees and taking photos, correct?

A. Correct.

Q. You weren't actually physically getting out and walking 100 acres or 40 acres of orchards?

A. Well, we walked a lot of them. In the course of the three years we were there, we have actually physically walked through a whole lot of those orchards. I mean physically we have. I would say that in every visit we did not necessarily. It kind of depended on what we were looking for that at that visit and what we were concentrating on. But we covered a lot of ground. I think in one -- I think one of the guys that was with us had one of these things where you can measure how far you walked. I

know one day we walked like ten miles.
Q. Well, we walked around -- I was there that day. We walked around the lot of the edges of the orchards that day, correct?
A. I don't remember walking the edges of the orchards. I remember walking through a lot of orchards on that day, but, nonetheless, we walked through a lot of orchards.
Q. Dr. Brannen, I want to switch to your views on Armillaria.
A. Okay.
Q. I think you said you know it when you see it, correct?
A. I do.
Q. Think it's fair to say Dr. Baldwin knows herbicide injury when he sees it?
A. I would assume Dr. Baldwin is competent in his field. Again, I disagree with his conclusions here, but he is a weed scientist, and so I defer to our weed scientists -- or not our weed scientist, but Mr. Mitchem in the back. And he's the one I've worked with in Georgia and so I defer to him.
Q. But -- and as Mr. Dukes and you pointed out in your direct examination, Dr. Baldwin's not saying that there is not Armillaria root rot at Bader Farms, correct?
A. He did say there's Armillaria root rot, that's correct.

Q. So he is acknowledging that there is the presence of Armillaria in some of the peach blocks?
A. He is.
Q. Okay. So the dispute then is really why it's there now, correct?
A. Why is there now Armillaria?
Q. Yes, sir. That is the disagreement between your opinion and Dr. Baldwin's, correct?
A. I'm not sure that we have a disagreement. I'm sorry, I don't understand your question.
Q. Well, let me walk through it then.

Dr. Baldwin's opinion is that Armillaria are mostly weak pathogens, correct?
A. That's Dr. Baldwin's opinion.
Q. That's my question. That's what Dr. Baldwin's opinion is, that they are mostly weak and opportunistic pathogens?
A. I'm not aware that's his opinion, but if he said that, that would be his opinion.
Q. And, in fact, in the Steiner article that Mr. Dukes pulled up for you a few moments ago, it does say that they are mostly -- or I can't remember the phrase exactly, but they are -- they tend to be weaker pathogens, correct?
A. You know, let me --
Q. Just if you could answer my question. Is that what that Steiner article says?

A. That's what the Steiner article says.
Q. Okay. As I recall from your expert witness report, you said something like, *Paul Steiner has an excellent review of Armillaria tabescens*, correct?
A. In the Missouri Bootheel, that's correct.
Q. Right. And nowhere in that expert report did you say he has an excellent review of this, except that I don't agree with this portion where he refers to it as a weak or opportunistic pathogen, did you?
A. I don't remember saying that in my expert report; however, I would say that I disagree with that particular portion.
Q. Okay. And I understand that that's what you're saying today, but my point is just that you -- in your report, you cited to that article and you never stated once that you disagreed with that, correct?
A. I don't remember stating specifically on that. I think I did talk about Armillaria to the best as being an aggressive pathogen to a peach, and it is probably the most aggressive pathogen, Armillaria pathogen, on peach. And so I don't consider it -- I don't consider it a weak pathogen in peach. When you look at things like oak trees or pecan trees, I think it is probably accurate to say it is a weak pathogen, but on peaches it's not normally -- tabescens is not.

Q. I can tell you I read your report many times. I don't remember you ever referring to it as aggressive in your expert witness report.

A. I may not have, but I'm referring to it as aggressive now.

Q. And are you familiar with some of the literature that does say that Armillaria tabescens is an opportunistic pathogen?

A. I'm familiar that there is literature that says that, but it's not on peach. In fact, in peach there's also very good literature to support that it is an aggressive, very, very strong pathogen. When you look at the rootstock breeder I mentioned, Tom Beckman, he says that peaches have no resistance to Armillaria tabescens. So, peach tree stock -- I should say peach tree stock does not.

Q. Are you done?

A. Yes, I'm done.

Q. I understand that that's your opinion, but there are -- and I remember going through this with you in your deposition. Everything I asked you about with respect to anything, it was different because it was peaches. So if peaches are different in every respect, then I think it makes sense that Bill Bader's peach trees just must be the most sensitive peach trees to the world to dicamba, right?

MR. DUKES: Your Honor, I object to the statement

preceding the question.

THE COURT: I'm not even sure what that was, so --

MR. DUKES: There was a lawyer argument and then there was a question. I object to the lawyer argument.

THE COURT: I'll sustain that.

Q. (By Ms. Randles) So your opinion though is that peaches are different, correct?

A. In respect to Armillaria?

Q. I'm sorry. Yes. With respect to Armillaria, your opinion is that peaches are just different, correct?

A. Peaches are -- and I think I'd be accurate to say this: Peaches are the most susceptible fruit crop to Armillaria that there is. All the other fruit crops are not nearly as susceptible as peaches are.

Q. So then let me ask you a few questions. If peaches are the most susceptible -- and that's your opinion?

A. Yes, ma'am.

Q. So, peaches are the most susceptible. But there happens to be peaches grown in Florida, correct?

A. There are peaches grown in Florida.

Q. And there are peaches grown in South Carolina, correct?

A. Yes, ma'am.

Q. And there are peaches grown in Georgia, correct?

A. Yes, ma'am.

Q. And there are a lot of peaches grown in Georgia and South Carolina?
A. Yes, ma'am.
Q. And Armillaria has been in all of those areas for many years, correct?
A. It has.
Q. And somehow people, farmers like Mr. Bader, are able to maintain their businesses, correct?
A. Not in every case.
Q. But in most cases, they are, correct?
A. What's happening right now is, we have the same problem he has. And so if you look at peach production in Georgia, I can take you to orchards that look just like his. And in some cases we have more land where we can either move to other places or buy more land or move out of that area where it's grown to the point you can't farm peaches there.

There's a farm right outside of Athens, a peach farm, and the gentleman who owned that peach farm, Armillaria put him out of business, and it truly did. That's what put him out of business, Armillaria.

Q. Dr. Brannen, I understand that there are some anecdotal situations where somebody might be put out of business for any number of things. There are situations right now, I think, where somebody's being put out of business over a herbicide injury called dicamba. What I'm

asking you -- you are making a distinction that peaches are completely different. And what I'm saying to you is, if there are peaches being grown in Georgia and South Carolina and Florida, doesn't that mean then that Armillaria doesn't necessarily just wipe out orchards?

MR. DUKES: Objection to the lawyer argument preceding the question.

THE COURT: It's compound with all the interruptions.

Q. (By Ms. Randles) Okay. Dr. Brannen, if you would answer my question, I will just move on.

MR. DUKES: Your Honor, I object to that comment to the witness. Not even a question pending.

THE COURT: I'll sustain the objection.

Q. (By Ms. Randles) Dr. Brannen, can peaches be grown in areas where there is Armillaria?

A. Peaches can be produced in areas where there's Armillaria, but the same thing applies: They will die.

Q. Thank you. Okay. So I would like to -- you know what though? You said -- I think a moment ago you said pecans and apple trees and other trees are not as susceptible. Was that your testimony a moment ago?

A. I said specifically oaks and pecans, but I said that of the fruit commodities -- and that's maybe what you're referencing -- the fruit commodities, peaches absolutely are more susceptible.

Q. No, I'm not asking about those. I'm asking you -- a moment ago did you state that pecan trees and oak trees are less susceptible to Armillaria?

A. When you asked me about it being a weak pathogen, it is a -- I would consider it a weak pathogen by comparison in oak and pecan trees as examples. And there are probably others out there, but those are two examples I can think of.

Q. Are you aware, back in 2016, Mr. Bader had a conversation with a Monsanto executive where he told him that 12 of his pecan trees were dying because of, he said, dicamba herbicide injury?

MR. DUKES: Objection. Beyond the scope of direct. We've now strayed.

MS. RANDLES: He's testified about it, Your Honor. They're all related.

THE COURT: I think he has testified to that.

MR. DUKES: He was led into that testimony by virtue of the questioning from plaintiffs' counsel, which does not open any doors.

THE COURT: Counsel, why don't you come up.

*** * * ***

(Discussion held at sidebar between the Court and counsel as follows:)

THE COURT: I'm not -- explain.

MR. DUKES: Your Honor, on direct we limited

specifically to peaches, not pecans, not soybeans, not anything else. Counsel has chosen to ask about --

THE COURT: That objection, I'll overrule it. I think it is relevant. What other objection?

MR. DUKES: Other objection is hearsay within hearsay. I mean, essentially, counsel is asking a witness who's limited to Armillaria science about internal conversations or documents relating to a Monsanto witness. That would be improper testimony for a science witnesses who's testifying about peaches.

MS. RANDLES: It was testimony, Your Honor, that was offered in this case, and I think the witnesses was -- I mean Mr. -- Dr. Brannen was sitting here during it. But this is all happening in the context of the litigation.

THE COURT: What was the question?

MS. RANDLES: The question was whether -- he testified that pecans and oak are far less sensitive to Armillaria, and so then I followed up and asked him, "Well, did you know that in 2016, Mr. Bader called Monsanto and told an executive that 12 of his pecan trees were severely damaged by what he said is dicamba?"

Your Honor, the link there is, if he's saying that all of these trees are dying because of -- and Mr. Bader also said, oh, I hadn't gotten to that question yet. If his testimony, all these trees are dying because of Armillaria,

I think it is worth at least pointing out that Mr. Bader's other trees are dying as well, and so something, perhaps not Armillaria, is killing those trees, which would mean that it's not just Armillaria.

THE COURT: Well, it seems a little tangential but I'm going to overrule the objection.

MR. DUKES: Your Honor, it's -- this witness has never heard that, so it's just like asking this witness, *Have you seen this Monsanto document before*, and the witness says no.

THE COURT: I understand, but she maintains that that is introduced into evidence in this case, is that right?

MR. DUKES: I don't know honestly.

MS. RANDLES: It has been.

MR. DUKES: Even if it has, this witness doesn't have any knowledge.

THE COURT: That's not the point of the question.

MS. RANDLES: There's all kinds of questions, Mr. Dukes, that have been asked about other testimony that have been given other witnesses weren't in the case.

THE COURT: I remember something vaguely about that kind of evidence coming in, but I'll overrule.

(End of discussion at sidebar)

* * * *

Q. (By Ms. Randles) All right. Dr. Brannen, so I think where we left off, I asked whether you were aware that

Mr. Bader told a Monsanto executive back in 2016, that 12 of his pecan trees were severely damaged by what he said is dicamba injury?

A. You're saying Mr. Bader told a Monsanto person or --

Q. Yes, yes.

A. I'm not aware of that, no.

Q. Okay. And so if -- and he also, in that same discussion, discussed other trees that were dying on his property, too, that he said was related to dicamba injury. Are you aware of that?

A. Mr. Bader is telling a Monsanto person?

Q. Yes.

A. Again, I'm not aware of those conversations, no.

Q. So if Mr. Bader has pecan trees and other fruit trees that are dying on his property that you say -- and you say those things, those kinds of trees are not as susceptible to Armillaria, does that change your opinion in any respect about how -- the strength or the weakness of Armillaria at Bader Farms?

A. I'm not sure I'm making the connection. If you're saying -- are you saying that you think the pecan trees are dying from Armillaria? Is that the question?

Q. No, sir. And, actually, I want to make sure I understand what your position is. Your position is, if trees on Bader Farms is dying, it is because of Armillaria;

is that correct?
A. If peach trees on Bader Farms are dying, I'm not saying it's all from Armillaria because -- but I'd say, fathom a guess, it's probably 98, 99 percent of the trees that are dying there -- it may be lower than that because of old age taking out some, too. Let's say about 95 percent. You still have voles also that are killing a percentage, but it's a relatively low percentage.
Q. You don't have an opinion about what's happening to the peach trees and the apple trees and the other trees, correct?
A. The peach trees, I do.
Q. But none of the others, correct?
A. I'm not -- no. I'm not familiar with any of the other trees that are dying, so I've not seen that.
Q. I want to talk to you a little bit about these aerial photos of yours.
A. Okay.
Q. Now, you're aware, aren't you, Dr. Brannen, that there is an entire field of study offered by the military and colleges in satellite photo reconnaissance, aren't you?
A. I've heard of satellite photo reconnaissance but I'm not that familiar with it.
Q. Okay. Well, satellite photo reconnaissance is a highly specialized field, isn't it?

A. I would assume it is.
Q. Okay. And it's a science of interpreting photos that are taken from space, correct?
A. Again, I would assume so. Sounds right.
Q. Okay. So it's a highly technical discipline; can we agree on that?
A. Again, I'm not familiar with the discipline, but if you tell me it is, I have no reason to refute it.
Q. Have you ever claimed to have expertise in what's going on in the field from a photo that was taken from space?
A. I have not in the past claimed that, but I can tell from this though that Armillaria is present. And you can see that same pattern -- and other people have also documented this as well. You can actually see that same pattern with Armillaria.
Q. I'm talking about this case. I don't know what other people you're referring to, but I'm talking about this indication and your opinions, okay?
A. Okay.
Q. Am I correct then that you have never diagnosed Armillaria root rot from photos that were taken from space before; is that right?
A. No. That's correct. I've not done that before this case.

Q. So you can't really tell why these photos that were taken from space -- you can't tell why these trees are missing or even if they are, correct?
A. In a sense you're correct. I would have to ground truth this. Again, if I just looked at strictly photographs and did not have any basis of ground truth that Armillaria was present, I couldn't say this is caused by Armillaria.
Q. When was the first time you were at Bader Farms?
A. 2017.
Q. Okay. And your first photo was back from 1996, correct?
A. That's correct.
Q. There was another photo from somewhere in the early 2000s; 2003, correct?
A. Correct.
Q. There were a number of other photos from also the early 2000s, correct?
A. That is correct.
Q. So you weren't at Bader Farms at any of those periods?
A. No. There's no way I could have been there.
Q. Have you seen any of the production records from Bader Farms during that period?
A. I've seen some of the production records.
Q. You understand then that Bader Farms was still very highly producing in that period, correct?

A. It was, but production went down at some point even prior to the dicamba timeframe.

Q. But during the -- but I just want to focus on the period of the photos from say early 2000s just because we don't have the -- let's focus on the early 2000s. We don't have the 1996 through 1999 or so production records in evidence, but just the early 2000s.

A. Yes, ma'am.

Q. Bader Farms was still highly producing, correct?

A. I think at that point it was probably like above a hundred thousand bushels or something like that. I'm not sure what the figures were. But it also went down dramatically over time, and I'm talking about even prior to what we're talking about with 2015. So the production did go down.

Q. That's for a reason. And I'd like to actually have counsel pull up -- bear with me for just a moment. Okay.

MS. RANDLES: Your Honor, I'd like to show -- this demonstrative actually we've already admitted, so if we could publish it to the jury as well, Your Honor.

Q. *(By Ms. Randles)* This is Plaintiffs' Exhibit 2194, Dr. Brannen. Have you seen this yet?

A. Here in the courtroom I have seen it. I've not been able to read it from a distance but I've seen it.

Q. Right. Yes, sir. So let's look at -- and I just want

to cover the period beginning at 2002, and let's just go forward a little bit, okay?

A. Okay.

Q. So 2002 to 2006, says the trees are still in their prime and they're producing on an average of 162,000 bushels a year there, right? Is that what it says?

A. That's what it says.

Q. Okay. And so then we go to 2007, and 2007 was a complete freezeout, so there wasn't anything, correct?

A. That's correct.

Q. And then if we move forward to 2008, there was 2,4-D damage that occurred on the farm there. Yields were still, you know, pretty good. There was -- Mr. Bader offered testimony about why they dipped a little bit there, but we're still 81,000 bushels, okay?

So let's go to 2009, 2009 and 2010. So in 2009, for instance, Mr. Bader testified that there was a very bad ice storm and trees were taken out in 2009, and then there's also been testimony from him that trees were taken out in 2010, correct?

A. Yes, ma'am.

Q. And then Mr. Bader also testified that in 2011 there was a significant flood that occurred in Southeast Missouri that also affected the number of trees and trees being taken out, correct?

A. That's what he testified to, yes.
Q. Okay. So then if trees are being taken out from ice storm and flood, those trees are being -- are not going to be visible from your satellite images from space, correct? They're not going to be in the photos that you showed, correct?
A. They would -- if they're dead trees, they would be.
Q. Depending on -- the trees were pushed out. They're no longer going to be in the photos, correct?
A. That's what I'm actually looking at is actually the pockets where trees have been removed.
Q. Right. So, my point is, you don't know why those trees were removed, correct?
A. No. You're right in the sense that, when I see a tree is removed, I can't assume that every tree that has been removed has been removed from Armillaria, so I would give you that. But when you look at years since then and with some of these orchards that have been newly planted and with the presence of Armillaria there, and when you see the same patterns in the fields, then you can make an assessment Armillaria is having a major impact to that site.
Q. But Mr. Bader also testified about the waterways, and you refer to that in your testimony, correct?
A. I did. Yes, I did.
Q. So, as you pointed out, there are a number of areas in

these waterways where trees are always missing, correct?
A. True. Yes, ma'am.
Q. Mr. Bader went through the drone footage and he pointed out low-lying areas and would mark it with the red on there, and he would point out the various low-lying areas, correct?
A. Yes, ma'am.
Q. And he said that those areas, there was always tree loss, correct?
A. That's correct.
Q. And he said that that was constant from the time that he started working in the orchard, correct?
A. Yes, ma'am.
Q. Okay. And so, again, you have no idea why those trees are missing even over the years, if Mr. Bader is testifying that they're missing because of ice or waterways or floods, right?
A. To some degree what you're saying is accurate, and I understand what you're saying. Again, if you go back to 2009, that was the ice storm, so you did have trees that I assume may have been removed at that time. There probably were trees removed. And I can't tell why a tree's removed, so your point's accurate on that.
But when I come back into a year since then, especially since trees have been replanted, then I can make

commentary on, look, that's not -- because we're not saying there's any problems like ice storms or things that have hit those trees more recently. I'm talking about prior to 2015. And, yet, you could see those same patterns in these orchards.

So, therefore, since Armillaria is there, since the patterns are the same, and since I'm seeing the same basic areas expanding again just like they did before, I can make an assessment that that's Armillaria root rot. So that's why I say it's Armillaria root rot in the photographs.

Q. But your assessment is just counter to Bill Bader's assessment, correct? Because Mr. Bill Bader is saying that those same pockets of trees are mostly missing because of waterways, correct?

A. No, ma'am, he's not saying that because there's not waterways everywhere where these trees are missing. If he's saying that, I disagree with him. I think he's pointed out some waterways, I pointed out some waterways, and those are obvious.

Q. In a number of the areas, for instance, the drone footage, Mr. Bader testified that that was affected by low-lying areas and waterways?

A. He did. He did.

Q. So Mr. Bader knows from one point to the next in his orchard what that land looks like, correct?

A. Well, also if you look at the drone footage, we used some of that drone footage here today, and you can see that it's not waterways. You can see it's well-drained land, and that's my point, it's not just waterways where trees are dying.
Q. Some of them aren't, but many areas -- and this is what he testified to in his direct examination. Mr. Bader said many of those areas, there's just even a little dip that causes the water to collect. Do you remember that?
A. I don't remember him saying that specifically, but I would disagree with that because we see this in --
Q. And that's fine. I -- it's fine if you disagree. But, Dr. Brannen, my question to you though is: Can you, from a satellite footage from space -- you cannot tell why those trees are missing, correct?
A. I cannot.
Q. Okay. You said -- at some point you were talking about the weed control at Bader Farms, correct?
A. Yes, ma'am, I did talk about that.
Q. And I believe there's -- I don't know, there was a photo or two, but in the 20 some-odd blocks of orchards that you visited at Bader Farms, there were plenty of areas where there weren't any weed issues, correct?
A. You'd have to take it block-by-block. And, again, I'd say that -- you know, because in fairness, it depends on

which visit we're on as well.

For instance, in my May visit in 2019, I noted that the weed -- and I made notes on that, and I think I provided all those notes. But the weed control was better. The weed-free strips were still not wide enough, and so you're still going to have weed competition, especially when it's dry, and so -- but I was happier with what I saw there as far as weed-free zones. At least there was something. But then those strips were not maintained for the rest of the summer, which they need to be maintained.

Q. So, Dr. Brannen, you talk about weed-free strips. Just so the jury is clear, a weed-free strip is an area on either side of the tree?

A. Underneath the tree and really on -- mainly underneath the tree.

Q. But that you're saying should be maintained as weed-free, correct?

A. Yes, ma'am.

Q. Okay. And there are certain recommendations that you make for orchards as to how wide those weed-free strips should be, correct?

A. Yes, ma'am.

Q. Okay. And -- but Mr. Bader, with his orchard, does maintain weed-free strips; you agree with that?

A. No, ma'am.

Q. Okay. So let me put it this way: So then Mr. Bader has areas of his orchard that have weed-free strips, correct?

A. He has areas where he has weed-free strips at certain times. When you say "maintain weed-free strips," I do not think he maintains his weed-free strips. And by that I mean for the adequate amount of time for going through the season.

Q. But Mr. Bader -- so Mr. Bader is on highly erodable soil?

A. He's testified to that, yes.

Q. And you -- are you also familiar with Mr. Bader's testimony about what happens to the soil there if there's too much water? I think you can probably glean that, correct?

A. Yes, ma'am.

Q. Okay. So Mr. Bader has had very good success with the way he maintains his weed-free strips, which, admittedly, is narrower than your recommendation, correct?

A. It is narrower than my recommendation. But Mr. Bader also uses cross-cultivation on some of these places that are pretty hilly, and he takes out -- there is nothing there to prevent erosion when you see that. I've seen that as well. I'd say in those areas a weed-free strip and sod would be much better than that process he's using there.

Q. But, Dr. Brannen, a weed-free strip on highly erodable soil, especially a 12-foot wide one, is not highly recommended, correct?
A. I don't know that as far as the highly erodable land. What I'm saying is some of his other practices for weed control, he's actually exposing more soil than with a weed-free strip, and I've observed that and taken photographs of that.
Q. But Mr. Bader maintains grasses under -- near some of the trees to help combat with the erosion, correct?
A. Not sure I'm following what you're saying. Restate that question, if you don't mind.
Q. So Mr. Bader does maintain grass middles, correct?
A. I don't know if it's grass, but there's certainly weeds and different things in the row middle. Sometimes it is grass though, yes, it is. I have seen some grass in some of the orchards.
Q. I guess -- so, okay. So this is a row of trees and say this is a row of trees. Are you saying that this is not a grass in the middle of the row?
A. Sometimes it's grass, sometimes it's just weeds. And depending -- I mean the weeds can be like waist high, so it depends.
Q. You don't have any pictures of those waist high weeds?
A. I do. I do. I have tons of pictures, so yes, ma'am.

I mean I don't know if they've been submitted, but I took a lot of pictures.

Q. And so --

A. But in fairness to Mr. Bader, they don't all look like that, so I'm not saying it's a hundred percent, but I'm still saying that the weed-free strip is not maintained well throughout the year.

Q. But Mr. Bader knows what he needs to do in his orchard to maintain the soil, correct?

A. Well, he has his thoughts on how he's going do that, I'm sure. And so, again, I'm not sure what his resources are, where he got his information on how to do that, but I respect what he's doing.

Q. Well, and the reason I'm asking is you -- early on you said, "I'm not here to attack Mr. Bader," but you've listed 13 things that you've said that the man is doing completely wrong in his orchard, correct?

A. Well, I don't know if you'd pull up that slide again, but the 13 things, these are all things I observed. Most of these can be pretty readily addressed, so I mean if I were here working in Missouri and Mr. Bader was one of the farmers I dealt with, I would go to him and say, *look, these are some things you can do.* Now, whether he'd do them or not, I don't know. Have no idea. But there would be suggestions I would make to him on how to correct some of

those things. Some of them could be corrected. Even Armillaria could be corrected because there are now resistant rootstocks out for Armillaria, and I'd advise him to get those.

Q. Have you noticed that in a lot of the trees, the area around the trees at Bader Farms, there is an area that's maintained that's weed-free? You noticed that?

A. Sometimes he does have that, yes.

Q. But with some --

A. I'm not saying every time, but sometimes he does have something where he's hoed out around the trees.

THE COURT: Do you have quite a bit more?

MS. RANDLES: I have probably maybe 15 or 20 minutes, Your Honor.

THE COURT: And then we'd have redirect, I'm sure, too.

MR. DUKES: Right now I have no redirect.

THE COURT: Okay. Can you go a little while longer then, folks? Okay. We will.

MS. RANDLES: I'd like to show the video 211.

(Playing videotape, Exhibit 211)

MS. RANDLES: So can we pause this? I'm sorry. We'd like to publish it to the jury.

COURTROOM DEPUTY: Has it been admitted?

MS. RANDLES: Yes, it has.

Q. *(By Ms. Randles)* Okay. So, Dr. Brannen, can you see there in the photo underneath the trees? Are you looking?
A. I'm sorry. Can I see underneath the trees?
Q. So here, like this area, maybe this area, you see that?
A. Yes, ma'am.
Q. If you zoom in, you have to look closely there, but that is pretty clean underneath there, isn't it?
A. Yes, ma'am, that is.
Q. Okay. So let's move on.

Again, here, same thing. You can see that there aren't weeds. I apologize, Dr. Brannen.
A. Do you want me to comment on that?
Q. No, sir.
A. I'd be glad to.
Q. I'm sure you would. No, sir. I like to direct my own examination, thank you.

You probably can't see it quite as well, but these areas, there's no weeds underneath there, and this was 2018.
A. 20 -- when was this? 2018, you said?
Q. This is 2018.
A. Yes, ma'am.
Q. This footage was shot, I think it was August of 2018. So we've got a huge area here where there's no weed pressure. I'm going to pause it. What we do have, you've

got the pond here, we've got some of these areas that Mr. Bader identified, some of these lower lying areas, and these are areas where trees are missing. Not the pond, obviously, no tree was there, but some of those areas are. Okay.

So, Dr. Brannen, you're aware that Mr. Bader has a soil conservation plan, correct? Conservation plan for the farm, correct?

A. Again, I'm not personally aware, but he's testified that he does, so I don't doubt that he does.

Q. Okay. But you didn't review it for purposes of preparing for the case, correct?

A. I don't remember having seen that. It may have been in some document I saw, but I don't remember it specifically, no.

MS. RANDLES: Your Honor, I'd like to show Plaintiffs' Exhibit 2203 to the witness, counsel, and the Court.

Q. (By Ms. Randles) Dr. Brannen, you got that on your screen, sir?

A. Yes, ma'am.

Q. You've seen this article?

A. I may have seen this article. I can't recall for sure.

Q. I think I showed you this article.

A. You may have. I may recall it more when we talk about

it, but I can't remember for sure.

Q. Okay. So I just want to draw your attention to this area. And I know you're going to disagree with me. Can't quite see all of that. Can we -- actually, can we go to the "some species."

Okay. So, this article says, "Some species of Armillaria are primary pathogens capable of attacking and killing trees, but others are opportunistic pathogens that kill only unhealthy --

COURT REPORTER: Can you slow down, please.

Q. *(By Ms. Randles)* I'm sorry. "Some species of Armillaria are primary pathogens capable of attacking and killing trees, but others are opportunistic pathogens that kill only unhealthy or stressed trees."

Did I read that correctly?

A. Yes, ma'am.

Q. So if the trees at Bader Farms are stressed -- even if there was Armillaria there before, if the trees at Bader Farms were stressed by herbicide injury, Dr. Brannen, isn't it -- I mean according to this, won't those trees end up succumbing to Armillaria? Correct?

A. You look at the first part of that, it says, "Some species of Armillaria are primary pathogens capable of attacking and killing trees." So, again, they don't require stress.

Q. But my question is: So, the trees at Bader Farms have not all succumbed to Armillaria, correct?

A. Not yet, no. No, they have not.

Q. And even in the years that you showed, 1996 and 2002 and 2003, Bader Farms was still in peak production, correct?

A. I don't know how to define "peak production."

Q. Bader Farms was still highly producing at that point?

A. They were producing. He still has a lot of trees now, so he sure had a lot of trees then.

Q. So in that period where you showed those aerial photos of all of the problems with Armillaria, Bader Farms was still producing, on average, 160,000 bushels of peaches a year, correct?

A. Based on your estimates, yes, ma'am.

Q. Well, that's the estimates that are in evidence, so --

A. No. I'm not refuting those or disputing them in any way. I'm just saying that's what you presented.

Q. So, since Armillaria, to the extent that, even if you're correct and it was present then, and I don't believe it was, but even if that's correct, it would still stand to reason that the herbicide injury that is occurring now has caused this Armillaria to start taking out trees, correct?

MR. ANDERSON: Objection, Your Honor. Counsel's beliefs are irrelevant and should be stricken from the record.

THE COURT: He can answer the question. I overrule the objection.

THE WITNESS: Okay.

MS. RANDLES: Let me try to --

THE WITNESS: I've thought a lot about that. I mean you and I went around and around on this in the deposition, too, as far as the stress factors and whether or not the stress factors are necessary, and so I've tried to think of a way to think about that.

Do you need stress? And, so -- especially with Armillaria. And I'm thinking about Armillaria particularly in a peach tree. So if you can think about it in terms of stress, I think we can all agree, if you have stress it can lead to clogged arteries, hardened arteries, and eventually you can have a heart attack, right? So, stress does that to us, so that's what stress does. You can look at us.

Now, I can be in perfectly good health, I mean absolutely good health. And if I happen to walk in front of a 18-wheeler truck going 70 miles an hour, I'm going to get killed. Now, I can also be stressed and I can have clogged arteries, about ready to have a heart attack, and if I jump out in front of that same 18-wheeler truck, I'm going to be killed. That truck's going to kill me.

Okay. Armillaria tabescens is an 18-wheeler truck, so the stress factors on Armillaria tabescens, there's no

evidence that there's interaction with stress factors. It attacks trees and it mows right through them, and so that's how you have to look at Armillaria tabescens. So stress does not enter into the equation with Armillaria tabescens on peach.

Q. Is dicamba the 18-wheeler truck in your example?

A. Armillaria. Armillaria is my -- Armillaria is that Mack truck. It just rolls right through peaches. So what I'm saying is, I don't think stress is necessary.

Q. Dr. Brannen, this article says, "Other strains of Armillaria are opportunistic pathogens that kill only unhealthy or stressed trees."

A. That is the case.

Q. Is it possible -- and I think based on your testimony, it is. It is possible that Armillaria has been in the soils of Southeast Missouri for hundreds of years, correct?

A. It has been, yes, ma'am.

Q. Okay. And Armillaria, even though it was there, was not wiping out Bill Bader's peach orchard, correct?

A. I don't agree with that.

Q. I want to skip down to the last sentence here that starts with, "in Florida." "In Florida Armillaria tabescens is the most common pathogenic species," and it cites an article there, "and is primarily an opportunistic pathogen." Okay. And then it says, "It may kill some healthy trees and

shrubs."

So, Dr. Brannen, are you completely unwilling to admit to this jury that Armillaria is not opportunistic in any respect?

A. In peaches I'm not willing to submit to them that Armillaria tabescens is. The Armillaria species, and even maybe Armillaria tabescens in certain commodities or in certain tree species, I would submit that that's a true statement.

The peach rootstocks that we have right now are so susceptible. There's just no resistance. It just mows right through them. Stress is not required. And I've seen this. You can have a perfectly manicured peach orchard, there is no stress in that orchard you can discern, and Armillaria will move right through it, so it does not require stress, not in the sense we think about it.

Q. I'm sorry. I thought you were done. Dr. Brannen, I have just a couple other questions for you and then we'll be done.

Back in April of 2019 -- no. I think we covered that.

MS. RANDLES: Your Honor, I think that's all I have.

THE COURT: Redirect?

MR. DUKES: Your Honor, we have no further questions for Dr. Brannen.

MR. ANDERSON: No questions, Your Honor.

THE COURT: You may step down. Ladies and gentlemen, we'll take a recess for the day and we'll resume again at 9:00 tomorrow.

Thanks very much for your patience and your attentiveness, as usual. So, remember the admonition when you go home. You're excused for the day then.

(Jury out)

* * * *

THE COURT: Okay. Just have a seat. I guess we need to talk about instructions. Let's see. He's here someplace, I bet.

MR. MILLER: He's in another room working on the instructions, Your Honor.

THE COURT: Okay. And who's the instruction team then? Shaw, Tracey. Who else?

MR. BOZARTH: Myself and Ms. Laddon.

THE COURT: Okay. So I'm not sure how much we can get done today. Maybe we should take 30 or 45 minutes and go through what we have preliminarily. We can do that here. Well, I don't know.

MR. MILLER: Your Honor, just for planning purposes, I wanted to let the Court know, we've got a few exhibits we've already talked about plaintiff with to move in tomorrow morning, and then we're resting.

MR. RANDLES: We're not agreeing to those exhibits.

MR. MILLER: Okay. There were some others, I thought labels or something. I don't know. Anyway, we'll talk about it. We've got some stuff to move in and then we're resting.

MR. MANDLER: We can start our case.

THE COURT: Do you have some idea of how long your case will be then?

MR. MANDLER: Two days.

THE COURT: Okay. So looks like we'll finish then.

MR. MANDLER: My chart right now, for what it's worth, projects closing on Thursday morning, but that -- I'm not taking into account the fact that Your Honor --

THE COURT: Well, okay. So going back to the preliminary instruction conference, I think we'll need to meet every night actually. So do you want to do it now or do you want to do it later or -- why don't we just go back in my conference room since we just have about half a dozen of us, and we'll just get through the preliminaries. And then we'll plan to meet tomorrow night, too, with more direction, I think. Does that make sense?

MS. RANDLES: Yes, Your Honor.

MR. MANDLER: I assume the rest of us can be excused.

THE COURT: Not yet. We've got --

MR. RANDLES: Actually, Mr. Miller and I -- and we didn't mean to leave Mr. Mandler out -- were curious if the

Court has given thought to the time limits on closing?

THE COURT: No. I was going to ask you, what do you want?

MR. RANDLES: My view is that what we have for openings would suffice from plaintiffs' perspective, an hour, 40, and 40.

MR. MILLER: We would want an hour, Your Honor. We've taken the brunt of this for two weeks. We very much shortened up our case. We would like -- if they get an hour, we would like an hour.

THE COURT: I'll give you more. I'll give you more. Same proportion that we did on --

MR. RANDLES: As long as the same proportion, I don't care what the actual number is.

THE COURT: Okay. But I do think that would be the most appropriate, same proportion. So whatever you all agree on then, now that you know that much. Just let me know and that will be fine.

So, all right. Why don't -- Shane will take everybody back to our conference room who's going to be on the instruction work group. And we're in recess for the day then. Thanks.

(Proceedings adjourned at 5:27 p.m.)

*** * * ***

REPORTER'S CERTIFICATE

I, Laura A. Esposito, Registered Professional Reporter and Certified Realtime Reporter, hereby certify that I am a duly appointed Official Court Reporter for the United States District Court for the Eastern District of Missouri.

I further certify that the foregoing is a true and accurate transcript of the proceedings held in the above-entitled case, that said transcript contains pages 1 through 163,inclusive, and was delivered electronically. This reporter takes no responsibility for missing or damaged pages of this transcript when same transcript is copied by any party other than this reporter.

Dated at St. Louis, Missouri, this 11th day of February 2020.

Laura A. Esposito

Laura A. Esposito, RPR, CRR, CRC
Official Court Reporter