

Minutes / Transcript from the:

**SAES-422 Multistate Research Project W-3008:
Integrated Onion Pest and Disease Management**

ANNUAL MEETING

Live-In Person & Virtual
Feb 28th at 2 PM -445PM EST

**In association with National Allium Research Conference,
Stop the Rot& Colorado Fruit Vegetable Growers Association
Denver, CO**

**virtual provided by: Washington State University Zoom
sponsored by BASF**

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February 28, 2022

W3008 Committee Officers – 2021:

Chair: Peter Rogers, BASF Vegetable Seeds
Vice-Chair: David Burrell, National Onion Labs
Secretary: Frank Hay, Cornell University
Past Chair: Bhabesh Dutta, University of Georgia

The meeting began promptly at ???

In Person and On-Line Participants are listed below

Participants: In-person and on-line.

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Welcome and Introductions: Peter Rogers (Chair) opened the meeting, introduced the other officers and then introduced Tracy Dougher, _____ title /

Tracy Dougher – Tracy commented that this group has been very active and that a W4008 proposal has been recently submitted (coordinated by Brian Nault.) Due to some hiccups in the NIMSS system they are still waiting on a few reviews; but we should know the outcome after the multi state review committee meeting in April. Tracy commented that her update was short as this group does a wonderful job. She further reminded us that an annual report is due 60 days after this meeting and that the review committee will be comparing the reported accomplishments to the project’s stated objectives. Special emphasis should be given in the impact statement portion of the report as to the benefit of group collaboration. Tracy commented, “As you write those impact statements look to those should not be full of jargon, but rather what you’re doing on a larger scale and what those ripple effects are from your work...”

Peter Rogers commented that the W3008 project is a multi-state group effort, with supportive funding coming from the federal government that helps to facilitate collaboration and coordination between the participants working together, to address similar problems that could otherwise maybe not be solved as individual states. Peter introduced Lindsey de Toit requesting that she give an overview and brief history of the prior 1008, 2008, 3008 projects. After which Brian Nault will give us an update on where the W4008 project is going in the future.

Lindsey du Toit: Lindsey shared the whole intention is for the USDA to provide funding for projects that are of significance across numerous States where the effort would be more synergistic when you bring States together, than individual States or programs or universities working in isolation.

The first one (W1008) was initiated by Howard Schwartz when Iris Yellow Spot Virus became a very serious problem in US. It first started breaking out Idaho/ Pacific Northwest and then in Colorado and other States. When we saw how widespread and how rapidly it was becoming a problem in onion production, Howard Schwartz led that effort to create this multistate project. It was really focused on thrips and IYSV, but as these meetings were held typically in conjunction with NARC and other onion related groups there was recognition that it could expand beyond thrips and IYSV.

When that five-year (W1008) project ended, the group came together and said let's expand this to include other diseases so W2008 became the thrips, IYSV and other disease issues in onion production. So more of us got involved in that second multistate project, the W2008. At the termination of that, it became evident that this group that tremendous synergy, and it also enabled us to do things like work on these USDA federal proposals like the Specialty Crops Research Initiatives so we could have a much stronger team going in to apply to these highly competitive Federal grants.

The W3008 was implemented when the 2008 terminated, and we're now at the end of our 3008. The 3008 includes all diseases and thrips, insect and disease issues. So we've been discussing through last year whether the 4008 proposal should include weeds because there's obviously a lot of weeds, lots of things that could be included in it. But if you get too broad, at some point it starts to diminish and dilute out the focus of a multistate project.

Thanks to Brian for leading that effort in 4008. It does include weeds. There was a question about food safety and about other issues, but we were a little concerned about being so broad that it becomes less meaningful and focused in an effort. So that's kind of the history behind it, and I think it's a wonderful testimony to the synergy that comes when you bring together people from very different backgrounds and expertise to build on the knowledge base of the experience.

Peter Rogers: Brian will update us a little bit on the W4008 a bit later. Before we do that, we will move on to our State reports and we're going to go through the State reports in alphabetical order. The first up is California, any delegates representatives from California?

California: Rob Wilson

The big issue in California is obviously water. We're seeing more and more Fusarium that's becoming more of a problem, and the difficulties with logistics and water have been big stressors on being a big State and growing onions through most of the year. You see those big changes or these big regions that have big water shortage. That means that you have to have a pretty big shift in acres to other regions of California which caused a lot logistical challenges especially for the people that are growing onions statewide. If they lose 10,000 acres in one place, they need to make that up some other way.

Robert Ehn

Well, we do remain active with Stop the Rot program, and also with Hannu Pappu, and Jeremiah Dung's program on White Rot. So we've still been actually working back and forth with those people. We also have an ongoing Fusarium program with Cassandra Swett at UC Davis because we found two different species of Fusarium that look to be important at different times of the year, and we have not had this Fusarium problem before. So that's the majority of the activities that we're doing right now. The acreage stays fairly stable at about 24,000 acres of dry dehydrated onions, and about the same number of garlic. We are growing in different areas, I will tell you that we've had to expand out of the Valley because of the water, and so will grow more in Riverside area and Southern California Imperial as well as I think expansion into Oregon to complete our acreage that we need to make the commitments.

Colorado: Mark Uchanski

I'm so grateful to see everybody in the flesh thank you for coming. I'm just, I'm beyond myself in terms of excitement level to be with fellow onion nerds and fellow veg nerds, and there's a big Veg conference happening downstairs by the way, so I hope we can cross pollinate as well. So here is the State report. Before I get into that I want to introduce Robert Sakata. Many of you know Robert, but I wanna make sure that he has the mic.

Robert Sakata:

Thank you very much Mark and I would like, thanks and welcome to Colorado. My name is Robert Sakata we have a vegetable farm just here north of Brighton. I'm one of the co-founders of the Colorado Fruit and Vegetable Growers Association which is meeting downstairs right now. At this time I'll ask Heather if she would come up to the front? Please Heather, I know you can stand away from the computer for a while. Come on Heather it's really been a pleasure. You know when I encouraged the meeting to be here I don't think Heather realized what she was getting into. We owe a debt of gratitude to Heather for all the hard work that she did in getting this meeting together and to help me. We have a bottle of wine from Colorado, there you go, and probably you can bring that up to the party later if you want, but we have some really, two other nice chardonnay's for you. But Heather thank you, she has been so amazing and putting this all together and everything, so thank you so much. Really before I get back to Mark, really

as a farmer and grower you guys know it in your own backyards with the producers that you work with, we're just also very appreciative of all the work that you guys do. It's so exciting, it's been so exciting I had the pleasure of starting up with Howard Schwartz when we started this group back in W1008 and it's just been fabulous to see it growing and be able to get to know many of you. That information that you're providing is really tremendously helpful. So thank you very much.

Mark Uchanski

Welcome everybody and here's our W 3008 Colorado State report. [SLIDE] That's me, then Mike Rotello, my team Jane Davy (research associate) and Antoinette Machado. We started off the year, it was the seventh wettest year in Colorado recorded history this spring which caused a lot of issues. A lot of growers had to replant onions, we had a pretty tough stand because of the wet conditions, but we managed to get past it, worked really hard and we're able to get a decent stand there. [SLIDE] Robert shared these photos with us.

Fast forward from roughly April to August 20th of 2021 and with that moisture that came late in the year also lots of severe damage with hail as well. I know Robert has farms and acreages spread out to avoid that, so if one storm hits, it doesn't hit all the farms, but still severe damage to 120 acres of onions, 120 acres of pinto beans and as Robert said "the joys of farming". [SLIDE] So that's the Pinto beans. [SLIDE] Here's an onion field. Thanks for sharing these Robert and my condolences truly, beat up onions, harvested early right? [SLIDE] So we had an annual field day and our Stop the Rot harvest that you'll hear a fair amount about tomorrow for the pesticide programs, as well as the fogging of the onions post harvest. [SLIDE] I wanted to make an introduction, Eduardo has been on our team at CSU for more than a year, but everybody who started, got brought on during the pandemic didn't get all the nice things about meeting people, so I think he's here at the meetings today. He is our produce safety specialist on the faculty at CSU and again started about a year and a half ago. [SLIDE] So there are his onions and his carrots there at a research farm. Are you in the room? He's around. [SLIDE] Mike Bartolo, real contributor, major contributor in this world retired at the end of the year December of 2021. But he's here. He's still working, and he said as long as he doesn't have to file reports he'll come and help you. So just take him up on that offer, genuinely nice guy Mike, and I look forward to continuing to visit with you in your retirement. [SLIDE] Here's a few other shots of our team there's Antoinette in the lower right, Brandon Sandoval, one of our undergraduates, Caitlin Hammond who I didn't get a picture of. Here's another undergrad, Jillian Lang, was in Howard's program as a graduate student but is still at CSU, Mike and Jane myself. So I think that's the Colorado report.

Georgia: Bhabesh Dutta:

Good afternoon. So before I start I'd like to acknowledge my Georgia team, so Brian Kitvo is here, he's our bacteriologist, we have Mei Zhao postdoc in my lab, we have Dave he represents Georgia growers and we also have Gi Yoon Shin she's around she's also a postdoc in Brian's Lab.

Alright I'm gonna give you my update. How was Botrytis leaf blight? It was not a big deal. We had some widespread infection, but it was more moderate, people were able to cope with it. Efficacy of fungicides. So I looked at the individual efficacy of the fungicides. We found the one thing Scala. Scala used to be very good fungicide. From last year it stopped working, not only in my trials but also in other trials. Scala stopped working. Luna, Omega, Miravis Prime they are still going strong. There is one experimental which has a good promise, it's a Group 3. Fungicide programs. So whenever we used Luna Inspire or Omega, Omega/Inspire or Miravis Prime/Inspire, Merivon/Inspire in a program it gave us a good efficacy against Botrytis leaf blight. In all of the programs I have Scala, but I think the heavy lifting is done by others, and not by Scala. New fungicide Cevya. Cevya is going to get labelled on onions very soon, a novel FRAC 3 fungicide. So, I looked to see where in a program with Luna, and compared it with the Inspire Super or Merivon, same level of efficacy. So Cevya can be a good rotation partner in our program against Botrytis.

Howler? So for our organic onion producers I've been getting questions "can we use Howler". "Does Howler bring anything?" Here's the answer, no. Howler is not effective. So whenever I also looked at different programs, heavy lifting done by other fungicides, not by Howler. Howler is not effective. What else? Catamaran. So, our growers used to use, actually they like using phosphorus and Bravo together, because it gives a broader protection, but also protection against Downy Mildew. So, our growers also like to use Viathon. So, what I'm showing here, if you use Catamaran or Viathon we'll have the same level of efficacy. But I think in my experience, Catamaran has an upper hand over Viathon.

OK, ranking of fungicides. This is the ranking based on five years of my trials on Botrytis. I'm finding Omega, Miravis Prime to be highly to moderately effective against Botrytis. Luna Inspire, Fontelis, Merivon are moderate. There's a big, there's a group of fungicides which have moderate to low efficacy - Quadris Top, Pristine, Switch and Quadris. Georgia growers like to start a program with Pristine until we hit March. So Pristine is a good fungicide when you have less pressure, so my data shows yes when you have it, it has a moderate to low level of efficacy and it works when you have a low level of infection.

OK, ranking of Stemphylium. Luna still working. So where's Christy? In New York it stopped working, but in Georgia it is still going strong. Merivon still works. Inspire Super Miravis Prime, Quadris Top, Pristine....

Peter Rogers: Interruption from fire alarm. For those online we have a fire alarm in the building, so we are currently exiting to the stairwells. Sorry for the interruption. We'll be back just as soon as we can. Meeting resumed.

Bhabesh Dutta:

So, this is the ranking with Stemphylium. The one thing which we have shown that Omega and Scala doesn't work on Stemphylium. Alright, Downy Mildew luckily that we did not see downy in 2021. But Downy was I would say a little moderate in '19 and '20, but keeping fingers crossed

Downy, we don't want to see Downy in '22 it is such a devastating disease. If it occurs two weeks before the harvest then it causes a lot of storage rot issues. So, we didn't have, luckily 2021 was not a good Downy season. OK fungicide ratings on Downy. I think I presented this in last 2018 W2008 meeting. Omega, Orondis, nothing works great on Downy mildew of onions to be frank. Omega and Orondis ought to have some level of efficacy. Bravo by itself. Bravo by itself is pretty good. Pretty good means moderate level of efficacy. If you tank mix with Bravo with phosphite, now here's another key with tank mixing Bravo and phosphite you have to be careful what phosphite your tank mixing Bravo with.

But in my experience if you tank mix with K-phite and Bravo there's certain degree of chance we may see some phytotoxicity. But with other phosphites we do have a good bit of luck. But ideally you can rotate with Bravo and phosphite in a short duration. Zampro does have moderate to low level of efficacy, but other fungicides like Previcur flex, Revus and Reason doesn't work at all. Revus used to be our mainstay downy fungicide in Georgia until 2017. After that we lost Revus.

OK insect update. This is from Doctor Stormy Sparks our vegetable entomologist. This is what he's put together. Thrips populations were extremely low in '21, and thus far in 2022 we have we don't have much pressure this year. Allium leaf miner has not been detected. Pennsylvania, similar damage similar ALM damage was detected, but symptoms are not identical. We do not know the cause. We did not see any typical oviposition scar or larvae or pupae or flies.

Lorsban. For this year growers have been incorporating alternatives into their programs because we lost Lorsban, I think today is last day we can use Lorsban. OK insecticide efficacy. Thrips small plot studies in onions. Due to low populations we could not deduce good insect efficacy data, although he took some data from the thrips work on tomatoes. So most the most important thrips we see there in Georgia is (Frankliniella) fusca sometimes we see (Frankliniella) occidentalis. (Thrips) tabaci is here and there sometimes, we don't have that much tabaci. So I think that's what I have. Thank you, questions any questions for me thanks?

Idaho: James Woodhall:

OK so we've got four programs at U of I looking at onions to various degrees so Doctor Mike Thornton over there who's looking at general onion agronomy and pink root, myself looking at policy and diagnostics, Justin Clements who is a relatively new entomologist he's doing some onion trials with thrips, and then we've got Brenda looking at bacteriology in Moscow and then we work quite closely with our colleagues in OSU Stewart and Joel Felix for the Treasure Valley.

So just to recap the season we did see a lower yields on average this year a lot of smaller bulbs and we're getting a lot of quality losses as well, so I don't know if Bob or Mike wanted to chip in on that or had some other...

Comment from audience: One of the worst bacterial rot years.

Yeah it's the first time in my career that I've had a project and the disease show up together. Usually the project puts it off, so yeah. OK so we did start off with quite a challenging year. We actually got a White Rot outbreak so this is a quarantined disease for Idaho. We have one field with some pretty spectacular symptoms. We've got good diagnostics for it so we have a qPCR assay and a Lamp Assay designed to a different gene. Usually we have to culture it because we need two methods to verify it. We're able to get the results at 24 hours. ISDA were quite generous this year and actually tried to keep the field going rather than sort of plowing down and destroying it straight away. I think the field was a write off in the end.

Stemphylium. So this has been a problem in 2019 when we saw the typical Stemphylium symptoms and then we got a lot of leaf or 'dirty tips' as Christy calls them. I think that's quite disgusting way of phrasing it! But anyway we got a lot of dirty tips in 2020. In 2021, it was very quiet for Stemphylium. We actually had a project funding it, so we were scouting for it. We didn't find any, but we got some PCR positives off some 'dirty tips'.

We're quite fortunate we have a spore trap network in Idaho. These Burkard multivial samplers. So that's mainly for potato diseases but we do test some of those samples for onion diseases in the in the Treasure Valley. So it does provide us some insights with what's going on with Stemphylium. [SLIDE] So this is what we saw in 2021, and in an ideal World I would have both graphs on the same slide but all you'll see is heads if I put it down there. So I'm just putting it at the top there. But we got quite low Stemphylium levels until August when there was a sort of a peak as you can see. If we compare that to 2020 when we had a lot of Stemphylium it was pretty busy in June and we got some spikes in in the summer hot period. And then again it ramped off at the end of the season where things started to die down.

So, as it was alluded to earlier, we had the heat wave in the Pacific Northwest. You can see the gray curve, so this was like late June to mid-July the temperatures were much higher than in previous years and what was also interesting, and it's kind of overlooked because of the heat and doesn't get a lot of coverage, we actually had in August a lot of humidity. We had like a week of relatively high humidity above 85%. So in 2020 with the red bars we got that humidity much earlier on, and that kind of dovetails in with the Stemphylium we saw. In 2021 we got this humidity in early August. So I think that humidity was too late for Stemphylium, but I do think it sort of ramped up the bacteria issues we had. So obviously with surveying for it we saw a lot of Enterobacter this year, Pantoea, and Pseudomonas and then we we got a lot of Bacillus and Proteus. I don't know what that means, but if we compare that with our previous years of Stop the Rot surveys if you look at the sort of the recognized pathogens we recovered them in in sort of similar levels, so that that accounts for saprophytes and all the other stuff that can vary year on year but the pathogens it was relatively consistent recovery. We got 260 isolates in 2021 for Stop the Rot which is about the same as we got in the previous year and we were meant to scale it down this year for Stop the Rot. But we had so many samples come in, we got 260 isolates.

That's about it really, the one thing I would like to say is we've been working, so Brenda Schroeder is working on Rahnella, she's got a project looking at that. We found that the Idaho isolates of Rahnella are kind of different I think based on rpoB sequence analysis and we actually find them to be not a weak pathogen, we think they're a little bit more aggressive than say other States have observed. So that's it, thank you for listening

Michigan: Doug Higgins:

We actually started our season off pretty dry which created kind of a perfect storm for some increased weed pressure for us, our preemergence we're not, we didn't get rain to get those going and then we got a lot of rain and we got some flooding in the plots that I was working in. But overall Stemphylium leaf blight is really our primary foliar pathogen that we're battling in Michigan we haven't seen the resistance yet that's being reported in New York but it's definitely what we see in and out in the past two seasons that we have been working on it,

New Mexico: Chris Cramer:

So, in New Mexico, so the top graph is showing maximum air temperature over the last three years 2019 in blue, 2020 and looks like orange to you guys, and then in gray was 2021 starting in May all the way through the end of August. And for the first part of the summer, it was fairly typical compared to previous years the temperature, but then you notice at the end of June temperatures dropped, and then we got a lot of moisture. So it pretty much happened the moisture that was gonna go to the Pacific Northwest found its way down to our place and caused a lot of problems for us. So this is actually a picture of our field the road getting into our field on the 7th of July. Our field is actually to the right there which by this time we didn't need drip irrigation anymore, we had plenty of moisture and that prevented us from getting into the field. And what unfortunately happened by the time this would dry up and we could get back into the field, this is on the 12th, we had another rain storm come through seemed to hit the research facility where we were doing our research which was different this past year. The ironic thing is the year before the well had gone down which forced us to move to this research facility which is a little further South of town, and we had the opposite effect much too much water. So that affected particularly our studies looking at thrips and Iris Yellow Spot really there wasn't a big issue after we had all this rain where pretty much the thrips were done and Iris Yellow Spot was done. It was really hard to continue our irrigation treatments and coming up with deficit irrigation treatment and stressing those plants after all the rain that we've gotten. These actually were our gauges to fortunately we're just about done with those but [unintelligible] wasn't all that great because of all the rain we got.

So under the research work that we have been doing and if you heard some of this already so we spent a lot of our time working Fusarium basal rot research on that you heard Suman Sharma talk about some of the progress that we've made in developing some resistance to Fusarium basal rot and she's gonna continue that work. And as she mentioned we're gonna be started focusing on looking at sterol saponins and seeing what role they have in resistance to

Fusarium basal rot. Previous to her work I had a previous PhD student actually here's Subhankar Mandal did a lot of work looking at Fusarium basal rot this first paper came out in '21 which was actually looking at some material before previous to the work was looking at showing we had already made some progress there with that germplasm. He also had evaluated some accessions in the USDA collection which is often not easy since sometimes determination can be pretty erratic, and he evaluated that both in using our artificial inoculation and through seedling screening and showed there were a few Pi accessions there that showed some promise that had some levels of resistance that might be beneficial. Then another study that he did that he published on was taking our visual ratings score that we do in trying to take images of those and convert it to digital form and trying to quantify actually how much disease we're seeing and seeing how well a digital image analysis correlates with our rating scale, and showed that really correlates pretty highly. And we're in the process, he started we kept continued it to see if we can automate that where we can actually scan the bulb the basal plates after that they've been cut and rate for the amount of damage that's there through digital means.

Other work we spent a lot of time working on thrips. I have student just finished up Shahab looking at the germ plasm that we've been evaluating over a number of years and pretty much confirming what we've already known that early in the season, what would be as Mike mentioned earlier would be considered semi glossy foliage types, have fewer number of thrips when you compare it to waxy types and we were using Stockman Early Yellow it's not really commercial cultivar but it's a good landrace, it's waxy, we've generated lots of seeds so we don't have to worry about it disappearing. We don't have to offend any seed company 'cause nobody is growing it and it's often very attractive to thrips and readily develops Iris Yellow Spot it pretty much in Shahab's work showed that pretty much the, I guess not really resistance, but we're talking about them in terms of thrips 'attractive' and thrips 'not as attractive', so early in the season thrips if they have a choice they'll go to these waxier phenotypes before they'll come onto the semi glossy types, and that as Mike mentioned may reduce one spray application if you're looking at economic thresholds and so you may not have to spray as frequently. Which actually leads into the second paper here.

We collaborate with Gina Greenway looking at what effect economically would we have if we came up with a partially resistant or less attractive cultivar that was semi glossy how would that affect as far as offsetting any yield reductions that occurred from Thrips or Iris Yellow Spot and how that would affect fewer applications, spray applications, and economically how that would benefit. And she showed not surprisingly there would be a huge benefit to that, especially probably after this particular year the Pacific Northwest had. And then finally our work on Iris Yellow Spot which really dovetails well with our thrips work there's a couple of poster presentations talking about the response we saw this past two years with Iris Yellow Spot again because of that delay and thrips coming in we're seeing a delay in Iris Yellow Spot symptoms on the semi glossy material that we've been evaluating. This past year was the first year and when we start doing these evaluations in 2019 we actually did some selections where we selected plants that had fewer disease symptoms. We've produced seed of those and this past summer

was the first year we got a chance to evaluate those selections. Unfortunately, it wasn't really the best year to evaluate it because the selection pressure wasn't very high. There's a poster on that by Stephanie Torres showing how even with the selection work that we did in 2019 we're making progress over the generation those selections came from and continuing making progress compared to the response we see in Stockton Early Yellow. And then finally this last paper really just characterizing the original lines germplasm we started with and showing how we had reduced symptom expression for Iris Yellow Spot in those lines. And with that I'll be glad to take any questions you might have.

New York: Brian Nault:

I've got some slides. So there are four of us from New York that are official members of W3008. So Frank Hay who is not here today and he's our current secretary. Christy, I don't know, does anybody know Christy? Christy Hoepting? Yeah, if she could stand up real quick. Alright, and myself and then Sarah Pethybridge and she also could not make it today.

I'm going to provide a quick overview of the season and granted if there is a bias towards Western New York quite a bit I'll admit that up front, and then I'm gonna provide just a brief overview of what's been done and kind of where we're headed over the next year or so. So, we had a really nice spring last year. The crop got in on time, everything was looking great. Evergold Prime which has just revolutionized onion smut control, anywhere where muck soils are where onions smut is common, has really done well. It's a seed treatment and growers have really had great results from it.

Then May was windy, hot and dry and as a consequence even though there weren't many thrips in onions at that time, they were in the landscape. And when you have hot and dry conditions thrips explode. And so they got started early and then became a problem earlier than normal, early in June. Let's see, so growers started their program earlier than normal, started with Movento, and it was really classic so after the two sprays then growers were really able to take a week or two or more off before they resumed their insecticide program. And we also saw IYSV really early in Western New York. It's really a problem just in Western New York. We don't really see it as a problem in other areas. We had a reprieve from the heat in July. We got some rain and everything was looking perfect, other than high thrips. And then just when we were saying how nice the rain was, then it bit us and we got a big rain event, 5 inches of rain. Fields were underwater some of them a little too long, and there were a lot of problems. So foliar symptoms of bacterial disease popped up pretty quickly after that.

In terms of Stemphylium Leaf Blight the Viathon/Tilt combination was 'King' I guess. It did pretty well. And again, just in Elba NY we saw a lot of IYSV. It was very common in fields, sometimes 100% incidence. And in terms of products for thrips control, Exirel especially at the real high rates, performed really, really well. It's something that we haven't seen before. Now I don't know if that's just because growers weren't using it as much, or if Radiant is slipping, or combination of the two. Then we had a lot of rain and humidity like we normally do in August.

We had lodging as a result of this and Stemphylium Leaf blight. We had the 'dirty tips' and many fields dying standing up. But yield and quality were very good despite some of these foliar symptoms. [SLIDE] This is Christy just before the five inch rain where she's saying "this is perfect", then we got all that rain. [SLIDE].

So here's just some photos of these early IYSV hotspots. It was pretty dramatic and there's no doubt it was IYSV symptoms, classic symptoms, and these little spots and then they took over. [SLIDE] Anyway here, my guess is it one of your trials Christy I assume, and with one of the best treatments with the FRAC 3's. Yeah, again we had some fields that were perfect landing like they should normally, maturing normally and lying over, then others dying standing up.

OK so now some other plant pathology updates so the Stemphylium leaf blight project goal here is to understand the epidemiology of Stemphylium leaf blight, investigate forecasting models to inform fungicide applications, screening new products, assessing fungicide use strategies to delay resistance development, and monitor fungicide resistance. So a number of USDA grants that are supporting this work. Frank, Sarah and Christy and then a postdoc in Sarah's program Dan Heck, and Audrey Klein is a technician, and Ethan Greenburg is a CCE educator in eastern New York. So just some of the summaries and I know you all in the back are not gonna be able to see the bottom here, but I'll read them. So there was rapid development of resistance in New York to Frac groups 2, 3, 7, 9 and 11, mutations associated with the FRAC 7 and 11 resistance were characterized, fungicide programs were adjusted annually on basis of these lab resistance testing and performance in replicated field trials. Volunteer onion and onion residues were identified as sources for Stemphylium leaf blight inoculum. We have a lot of barley windbreak early in the season to prevent wind whipping of our seedlings and there was some concern that maybe barley would be a source for Stemphylium leaf blight. Barley was found not to be a major contributor so that's good news. There's an SSR study of genotypic variation in New York that's nearing completion and finally some validation of forecasting models in spore trapping studies are underway.

And then just real quickly Sarah and Frank and let's see a bunch of others here Christy, Mary Hausbeck, Sushi, Lindsey, Stewart, James Bhabesh, I don't know who A. Putnam is ... Alex OK there we go and anyway it's Greg Colson and Subas are all part of this proposal that went in for an SCRI for Stemphylium Leaf Blight. And I'm not sure probably within the next month or so there will be an indication of whether or not there will be the go ahead for a full proposal, but my guess is it's gonna go it's really important. Obviously a great team of folks, and it's a big, big problem. And then Stop the Rot I assume there'll be more discussion about this tomorrow, but there's number of trials, primarily I guess Christy probably conducted all of these, most of them right? And I will say that there are a couple posters on some of Christy's results that you should take a look at, and I guess some of the other information will be covered tomorrow. [SLIDE] Alright, and here's Christy team. So Emma on the left and Sarah on the right.

So now entomology updates. So a lot of thrips work in my program part of the SCRI, a different SCRI funded project involves optimizing onion thrips control without compromising bulb yield in

conventional production systems by reducing synthetic chemical inputs, mainly fertilizer and insecticides. And the project has just finished up. Essentially Karly Reagan was postdoc in my program and worked on it with me. She has now taken a job with Penn State Extension which really good, for Karly, and Penn State. And just some of the highlights. I'm gonna talk in much more detail about these tomorrow afternoon during the other SCRI update. I don't think there's gonna be that many people there, but anyway if you're interested in this certainly show up. I'll talk more in detail about it, but just the Cliff notes here, reducing fertilizer had no impact on thrips which is the bad news. But the good news is we didn't see any impact on bulb rot incidence, we actually thought it would be lower but we didn't see any difference. But we didn't see any difference in quality and yield by reducing fertilizer quite dramatically.

Thrips were managed effectively using an action threshold based insecticide program and we saw a savings of 2.5 fewer sprays using the threshold compared with the weekly spray program so that's pretty cool. [SLIDE] And then continuing on or with thrips here, this time management in organic production systems. This was a project supported by an OREI project. It's nearly done. I recruited Lindsay Iglesias from Florida as a postdoc to work on this. She did a great job and has moved on to Green Light Biosciences. And then after she left, I recruited Pin-Chu Lai from University of Georgia and she picked up where Lindsay left off and other contributors were Mike Havey and Russ Groves and Sarah Pethybridge and Frank. So, what we found is the semi glossy onion cultivar with mild resistance to thrips didn't reduce thrips densities unfortunately. We did see some inconsistent results of using reflective mulch compared with white mulch for reducing thrips so nothing consistent. And the most effective way of managing thrips in organic onions was using Entrust which is spinosad and it's organic formulation of that product. And we saw an inconsistent relationship between thrips densities and bacterial bulb rot incidence. One out of three years we saw a positive relationship but the other two we didn't. It seems like rain and some other factors are much more important than thrips for bacterial rot incidence. More thrips.

Gonna talk about some of the project goals for my second year PhD student Lydia Kormondy. What she's gonna do is improve decision making process for onion thrips control by developing a sequential sampling plan and she's also looking into the spatial temporal patterns of both IYSV and onion thrips densities, in transplanted and direct seeded onion fields, and then she's gonna compare the densities and IYSV incidence and severity and onions that receive early season thrips adulticides. And I don't have a lot of time to talk about this but essentially right now the programs that we're using for thrips aren't doing a great job of controlling adults. We think that maybe we're getting in early influxes of viruliferous thrips that are starting IYSV early. So we're going to test the hypothesis of using products that are going to kill adults and see if that can lower IYSV and by the end of the year. And let's see, number of funding sources, and so far the project is getting off to a good start.

And then finally I actually get out from behind my computer and I get into the field as much as I can, and I do the stuff that maybe is less glamorous but pretty important. So I'll put on a backpack and evaluate different products for thrips control, and I'm gonna actually do that on

both bulb onion and green onion this year. And also gonna work with Christy looking at thrips and disease vulnerability and commercially available cultivars. And I want to introduce my brand new technician his name is Matt Garlic. Obviously there were a lot of candidates but once I saw his name "you got the job buddy". How can you turn down a guy with a name Matt Garlic right? Anyway so he's doing a great job really really good.

OK and then finally sticking with more insects, but now jumping to onion maggot, new PhD student Leo Salgado recruited him from LSU. Yeah there's a trend here recruiting from the SEC, Georgia Florida and LSU. At any rate he's gonna estimate the proportion of *Delia* species that we have in our onion fields you know we're 99% sure that we have 99% onion maggots but you know what we haven't really done the research to know how much seed corn maggot we have. And I think those of you and other areas that think you have seed corn maggot might wanna send me some samples that confirm that they are seed corn maggot not onion maggot. At any rate. And we're gonna assess the susceptibility of onion maggot populations to some of the were commonly used products like Spinosad, cyromazine . We're gonna throw this new Plinazolin technology the ISO cycle serum into that as well. So we're gonna have seed treatment trials, but we're also gonna do some lab bioassays as we suspect that there may be some resistance developing to Spinosad, but we don't know it could be other factors. But we're gonna try to get a handle on that using these assays. And then also I'm just curious to know, you know these muck pockets are pretty isolated geographically, so we also think that maybe the onion maggot populations are also geographically isolated or unique. But we don't know, so we're gonna look at the population genetic structure to see how unique they are. That could potentially inform management insecticide resistance management programs. And let's see anything else? Number funding yeah anyway so he's gonna get started here this spring on that.

And this is the last project allium leafminer. I know this was a real big deal back in July when we were in Madison, because it had just hit the stage and I talked quite a bit about it. And I guess the bottom line is that I really don't think it's gonna be an issue for bulb onion production in the US. I hope that's true but based on what I know in my experience I think that's true. It's a really bad problem for things like scallions and leeks that are planted in the fall because the fall generation is much larger than the spring one, so that's where there are problems. And specially small diversified farms organic farms, that's where you really can see this as a problem. It has spread as far as South as Virginia, as far north as Massachusetts based on what I know so far. OK, so yeah looking at developing both chemical and non chemical approaches for this particular insect in onion and well mainly related allium crops like leak and scallions and both conventional and organic systems. And I recruited Ramadeep Sandhi from Montana State University to work on this, and she got started a week ago tomorrow. And she already got a job and left back in November for FMC. So there's a trend here so yeah get into my program and get the hell out! But anyway, no I really enjoyed having Raman. She really did a great job for the time she was with me. And then I convinced Pin-Chu to pick up where she left off so Pin-Chu is gonna work on this project. So what we found is a number of effective insecticides and as well as some timings of the spinosad based insecticides for managing this insect. So we can

manage it pretty well with two applications under low to moderate pressure, otherwise you're gonna have to go up to maybe three. And we're gonna look at maybe developing a phenology model for allium leaf miner on a variety of allium crops for the fall. We've made some good progress there. Definitely are some preferences among the different allium species. And we will evaluate nonchemical strategies as well like, excuse me, some insect netting row covers and reflective mulch and those types of things. All right move on, or any questions?

Mark (from floor): Actually have a question about corn maggot and onion maggot. What did you say about the 99% percent?

Brian Nault:

Oh well I was mentioning that we believe that in New York and really pretty much throughout the Great Lakes that it's likely that onion maggot *Delia antiqua* is the principal species of maggot killing onions and that in the West it's seed corn maggot. But many of us, you know, we don't really rear the maggots out or use some type of assay to confirm the species composition. You know it's a maggot kills a plant. You need to use more than that? It's an onion plant, it's a maggot so maybe, maybe not. But so anyway we just wanna get a better handle on that, alright.

Peter Rogers:

Very nice. I think you're starting to pick up on a little bit of a theme to hear how environment really impacts your onions as you can see the New Mexico and New York updates. Right at this moment we're going to take a 10 minute break, so if we could please go ahead and convene outside for about 10 minutes. Take a break get some fresh air, and then we'll be back in 10 minutes. Thank you very much.

We will continue with the second half of the W3008 session. Now at this time I would call the delegates from Oregon. Are there any delegates from Oregon?

Oregon: Jeremiah Dung:

Alright I'm Jeremiah Dung. I'm in associate professor and interim director at the Central Oregon Ag research and extension center with Oregon State University. I'm located in Madras Oregon. We don't grow onions there. But we do have a history of growing garlic seed and onion seed in the area. One of the reasons we don't have much allium production anymore is because of White Rot and that's one of the research projects that I'm involved in. It's in association with the SCRI grant that Hannu Pappu is leading to look at thrips, IYSV White Rot. So, I won't be able to give you an update on the onion industry from Oregon or the Treasure Valley, but I can just give you a quick update on the research that we've been doing over the last year or two.

So if any of you saw the presentation by doctor Khuong Hua, she's in the room today, she talked this morning about the use of trap crops for White Rot reduction in soils. We did a mini series of experiments in the greenhouse, growth chamber and in the field. I think what we've consistently seen is that we can terminate allium crops or an onion crop about the two leaf stage and not have reproduction of the pathogen on the crop, and actually see anywhere from 40 to 70% reduction in White Rot sclerotia in the soil. In those trials we looked at chemical termination, mechanical termination. We found that chemical termination was the best way to do the termination of those trap crops. We also looked at whether or not fungicides could be used in conjunction with these trap crops with the idea that the fungicide might prevent or slow the infection process and reproduction of the pathogen, so it could kind of extend that window of the trap crop. We didn't see that effect. But overall we're seeing that that two leaf termination stage is really the sweet spot for this trap crop strategy.

Some of the other work we're doing in terms of germination stimulants for White Rot. One of our collaborators Michael Chen at Oregon State University has worked on encapsulating diallyl disulfide which is one of the major germination stimulants that we've used for White Rot management. He's also encapsulated garlic oil, and we've done some trials showing that encapsulated products are equally as effective as the traditional DADS products. The nice thing about these encapsulated products is that they have a lower volatility, they're easier to handle, and it appears like we can apply them either in a dry or liquid formulation. So they're a little bit more flexible in terms of application. Then finally we finished up two years of work looking at some new fungicide products and it looks like pyraziflumid which is a product from the [unintelligible] has some pretty good efficacy against White Rot in garlic, comparable to tebuconazole, not as good in our two trials but significantly better than no treatment alone. Under the conditions that we had in our in our trial, with high disease pressure, we were impressed with its efficacy. So, with that I don't think there's anyone else in here that can chime in on Oregon onion production, maybe Idaho? Thanks.

Pennsylvania: Beth Gugino:

Yeah so I'm Beth Gugino from from Penn State. I'm the vegetable extension plant pathologist there. I felt obligated to share a couple of slides and I'm glad that there was break in Oregon between me and New York. I think we go from some of the larger production to me, with people asking how many onions or how many acres of onions are grown in Pennsylvania. And I think we're about 125 acres in Pennsylvania. So, it's a small, it's a small crop for us. But I just wanted to put some visuals in terms of what the weather was like, like Brian's description of what it was like in in New York. So, the northeast regional climate center does a really nice job of visualizing the weather. So, what you're looking at here is the percent normal precipitation for April, May and June on the top, and July, August and September on the bottom. So, the more red you see in the map, the drier it was, the more green you see the wetter it was. So, in Pennsylvania we grow, we plant our onions in April, and we harvest them in really early July and so I feel like we hit the sweet spot in that we did not get this rain. Our onions weren't exposed to all of the rain that we had in the flooding conditions that we had later on later in the season, and so that really

was fortunate for us because when we get a lot of rain we know that we have, you know, exacerbated bulb rot. So that just put some visual in terms of what the season looked like in terms of precipitation. Then this is what we look like in terms of temperature. So similar departure from average, and so the more red you see the higher the temperature departure, the more blue you see the cooler it was over the course of the of the season. So really we were maybe a little bit warmer in June, fairly average in July.

So, this year in scouting for bacterial diseases it really was not as significant. We found it, we find it every year in every field, so I could easily find the plants we needed for survey. But it really wasn't quite as devastating as it was in 2020 for us. So, I think these maps, I always find these maps to be really useful in terms of, kind of you know, thinking about how the how the season really went. So yes we were fortunate to get our onions out of the ground. We did have some thrips pressure earlier in the season. Still trying to convince our growers you know that thrips need to be managed. We still do see *Stemphylium* leaf blight as well. So, from a disease standpoint that's the summary I know.

For those of you who don't know, Shelby Fleischer is the vegetable entomologist at Penn State and he has done some work on allium leafminer when it when it first was detected in Pennsylvania and he retired in December of 2021. He's still hanging around a little bit but we don't have a vegetable entomologist, so Brian's job is saved on a regional level for a little bit. We're hoping that we can get another vegetable entomologist here in the next couple of years, but we are very thankful to have Karly Reagan, she has a pH D in entomology, and her work with Brian has been really valuable. And we're hoping that she can kind of bridge the gap for us in terms of vegetable entomology in Pennsylvania. So, with that, just short and simple. I will say we did go to a packing house at the end of the season and we did have a few issues with Black Mold in some of our crops and really that's you know a post harvest issue, not drying them down properly, and things like that. So we're still working with that and our growers in terms of really proper harvest proper drying down to prevent some of those issues.

Texas: Subas Malla:

Thank you, good afternoon In 2020 with COVID we didn't do that much work in the field, and we have an issue with manpower because of Covid. And so the breeding work, we were not able to do that much work.

I'm just talking about the survey that we did for Stop the Rot. So out of a total 180 samples that we collected from Texas, only 16.1% were infectious based on leaf scale assay, and out of them 9.4% were *Pantoea*. So the total sample we collected was 53 and then 9.4% was *Pantoea*, virulent on scale assay. We found 47 sample for *Erwinia* and 14.9% were virulent. So overall there was not much bacterial diseases in Texas. [SLIDE] So this is the virulence of different bacterial diseases, and *Burkholderia* we saw this in [unintelligible] variety. And it has high virulence, so blue is scale assay, and this one is for bulb assay. So *Pantoea* also has high virulence and so the number of isolates are five and nine here. And we found one

Curtobacterium, and this looks like a novel, and we're working on this manuscript. And so Pseudomonas has moderate virulence, and we also found one Pseudomonas which looks novel and so we published, the paper is accepted and it will be soon publication. So the Enterobacter and Erwinia have less virulence.

[SLIDE] So this last year 2021, as a lot of people mentioned rain, but we had a snow and so there's a winter storm in this location in Texas. Temperature got -14 or something like that for a few days and affected the production. So after the winter snow damage this is what the plants looked like and because of that in some fields, and specially in overhead irrigation, we did see Pectobacterium bacteria. This is the first time that we saw, last year we didn't see anything in 2020. But this year we saw Pectobacterium in one field. So, in the same field we have a surface irrigation but there was no Pectobacterium there, and looks like overhead irrigation helps develop this disease. So, in one field we saw this pink root and field was completely damaged. The grower mentioned that it was a storm, looks like a storm and pink root mixed. There was a thrip damaged one. Grower mentioned thrips damage and Brian and he might contacted them and told him not to put the pyrethrin on in the beginning. So that's. This year they mentioned that season is pretty good and they have rainfall and low thrip damage so probably this year is going to be better for them. So, with that, that's all for Texas.

Utah: Dan Drost:

I'm Dan Drost the vegetable extension specialist, and Claudia is in the back, and the stuff we have associated with in the Utah report. It was a kind of a normal year this year for us, and I think the issues that we had to deal with were relatively minor. Our acreage is pretty stable, many of our growers are transitioning to irrigation away from furrow irrigation over to drip. That's our biggest issue right now. Water is gonna kill us this year, it's a problem in the West as you've heard, and so we're really trying to help them you know deal with some of the same kind of issues that we heard this morning. Those that are really important for us, as we're looking to the future. Snowpack is real low this year. The likelihood of water being shut off mid-season is gonna probably happen, and so that's gonna, maybe hurt growers. I know I've talked to a few that probably are gonna quit growing onions and some crops just simply because they know that the late season water is pretty important to them. So we'll just have to see what happens you know, there's still some time.

Our next biggest problem is just urbanization. Most people think of Utah as rural. We are the second most urban state in the union because all of them live in the Salt Lake valley, and so it really is urban and that's where agriculture is. Land prices are, we are getting farmers regularly that developers are coming and offer him a half a million dollars an acre for development rights. So, I don't know how you farm that. You can't certainly buy a farm. I mean they're really stressing about this, because you know it's every day someone's coming to the farm to try and buy their ground, so they can put up a house. And that really is hurting us, it's hurting the rotations, so certainly that creates some other pressures that are there. And so growers are just trying to figure out how to, you know, not grow houses and grow onions or other commodities.

So I don't know what to do about it. I'm glad I'm retiring. So sorry, next year I'm just telling you guys next year I'm gone, and it's so frustrating to see that water wars are happening, it's come to fists. I mean when they say you know "whiskeys for drinking and waters for fighting" there's truth in that statement. People are fighting over water because it's so short supplied, and they're fighting entities that they can't even imagine. Cities are taking the water that was developed for farms is being taken and and they're mad. We're caught in the middle, the University's caught in the middle, and it's probably not that bad any place else in the country, but it's bad. And so we have weird water laws, we have you know, and growers are just struggling. They're trying to manage, they're always getting the finger pointed at them that we're the wasters, that water for Ag shouldn't be there.

We did have quite a bit of money, we got quite a bit of money from the State because they you know "Oh well you know Ag can optimize water more" and yet it still takes 30 to 36 inches of water to grow a crop onions, that doesn't change, that has never changed. So why do they say that you can grow it with less? I don't get it because they don't get it, they don't understand it. All they see is people need it, industry needs it and that's their tax base.

And so you know while we've done a lot, growers are you know putting in you know half million dollar pits in their properties to store water so that they can do exactly what Darren talked about. And it's like yeah you don't water onions with drip like you do with furrows. And that's exactly what you're doing there, and so you need to get them guys to think a little bit different. But that doesn't change the amount that they need, it's still the same amount of water that you need.

So, we've done quite a bit of that and we found that was kind of the biggest problem that the furrows we know really over irrigate, lots of runoff, lots of deep perc and all those kinds of things. And we were able to show the growers you know, kind of, really what the number is, but they still have to you know, kind of trust it. But then if they don't have water that comes to the farm that I can fill my pond with, it doesn't matter, the crops suffers. And so it's been frustrating for the last couple years as we've been trying to help our industry get through it. You know certainly when we look at these kind of things we haven't seen some of those issues that you guys have seen, where you know we get this suppression of growth in the middle. Actually, we kind of see the opposite on the shoulders sometimes we have a little bit, because some of our soils are a little sandier and so we're getting deep, we're getting water pushing straight down rather than spreading out. The growers kind of understand that they need to wet the top of that bed and yet if they wet it too much with such a shallow rooted crop that creates a problem. So, trying to deal with these depletion things is important for us, in you know, certainly with our water if you do short the crop, that shorts income. That then drives growers to say I'll just sell my property for half a million you know, I might do better anyway and go to Cabo, who wouldn't wanna do that? [SLIDE]

Claudia has been working on leafminer. We got a little bit of money from the State. We're finding, I'm just can't even say (Liriomyza), so somebody help me out there, that's what we're

finding. And it's not, it's just a normal leaf miner, does a little bit of damage in the crop and finding it every year. It doesn't really impact us, but Claudia is gonna keep looking at it. Diane Alston many of you know her, our entomologist, she got sucked in down the rabbit hole of administration, and we couldn't we can't pop her back out. So you know it's just like we need to get her back out of that rabbit hole 'cause we do need an entomologist as well. So Claudia has picked it up. So thank you Claudia for all you've done with that stuff, and basically it was just really to document kind of, what kind of leaf miner problems we have. And they're not causing us any problems so that's basically what we said. Claudia has been also doing a lot of, bit of survey work, and these are the diseases that we kind of identified last year in our field surveys. If you need the specific numbers on them Claudia can provide those for you.

We did a few publications, we always update our vegetable management guide and it's helpful. Certainly, the stuff that we get out of the work here had a few things that were published about research work that got into Onion World, and stuff like that. We've had our Association meetings and we're meeting back in person again which I'm thankful for. I had a beautiful discussion with our growers at our last meeting. They were so thankful to actually see people again and see each other kind of too, and so that was really cool. We had a field day and certainly we've got growers that are asking us all kinds of stuff for targeted research. And it's really helpful to come to this to see what you guys are doing because I can cherry pick stuff to bring back to our growers. So with that I wanna thank the association of researchers and all the efforts in those big States because you really do help our little guys. I'm not as little as Beth is, but I'm pretty close to that. So Beth is down there holding us all up, I call her the Atlas of there because you know it's the, it's the little guys that are equally important and they have contributions. And I've really really enjoyed working with you guys. I will see you next year, but I am retired next year so just let you know. OK thank you, any questions?

Washington: Tim Waters:

So as a lot of people in the West have indicated we had excessive heat in Washington as well this year. It came in in late June and we had some excessively high temperatures. We typically cool down the evenings, but we just didn't do that you know, we got up to 100 and 117/118 degrees F in some areas, and it was really stressful for the crop and for the growers. Keeping the crop irrigated properly was extraordinarily difficult. So Lindsey's gonna talk about some of the issues that we saw as a result of that, but it was a really tough year to grow onions. Our yields were down, our sizes were down, pretty tough year. I think our storage onion crop was about the same but I am seeing more acres of garlic seed and dehydrated onions in the basin, so that seems to be increasing a little bit every year. And so that'll put a strain on our acres I think in the rotation. We have pretty good rotations but with the more acres we see, I think it's gonna maybe put some constraints there. Let's see, yeah I mean we had times we were putting 6/10 of an inch of water a day on the onions and we were not keeping up with the evapotranspiration, so that's pretty significant. So much so that my wife thought I had a girlfriend in Pasco because I was at the farm every day, and she was like, she rode with me a couple times, which she never does. So I'm pretty sure she thought I had a girlfriend. But she

figured out that I'm just really devoted to onions, not so much as Christy is devoted to onions, it's a little bit strange. But, and I do feel like somebody told me we might have to do sensitivity training if somebody listens to everything we say in here, so I'm trying to really clean it up for us, so keep my analogies clean, you know.

Our growers had a lot of trouble with weed control this year too. And I don't know if it was the spring, our springs are always windy and tough to get the herbicides on in a timely fashion, but our growers really struggled with weeds. We do have to hand weed quite a few of our fields, and labor was not only really, really expensive, it was really hard to find. Even on our plots it took us weeks to get our onions weeded because we just couldn't get people there. And when they were there, it was costing me 17 to 18 bucks a person an hour, and it's just really hard. So, we're doing some targeted herbicide trials next year. I'm not a weed scientist we're bringing a weed scientist on very soon at WSU but I'm trying to get some herbicide trials going so that we can maybe have a way to hook that new person into working on onion. So, we're optimistic that we'll see some help there.

We actually saw lower thrips in a lot of fields this year which was really interesting. And I do think, you know, prior to the heat the thrips were increasing normally. We keep pretty close track on thrips in our test plots, but when that heat came in we saw very, very low thrips numbers and a lot of commercial fields, and in our test plots. Those sandy soils were excessively hot, and they really didn't cool down during the evening, and I'm really, you know, I gave a presentation on this at our growers meeting, and I think that we may have seen some lethal temperatures to thrips in the soil from those excessive temperatures. That was a good thing. We did have growers, our growers do scout so they were calling me and saying "hey we're not finding thrips what's going on?" and so they did save some money on thrips applications in general so that was a good thing.

Let's see, Lindsey's gonna talk about all the disease stuff, but we'll be, we'll be doing more work with seedcorn maggot this coming year. As everybody knows today was the last day to legally use chlorpyrifos on any crop, or almost all crops in the US. And that's been a big use for our growers, and then the seed treatment that they use is restricted in the number of the amount of product is really restricted. So growers will have what they need for Farmore FI 500 probably this year, but they probably won't next year. So I'm working feverishly on alternatives, Brian as well, and I think that the team down in California is also doing some trials too. So we're working for you guys on that. If you have ideas let us know. We're kind of coming up with everything we can to come up with some options because we think that there could be a gap for the next year or two between some of the new things becoming labeled and the loss of the things that we lost here recently. We've done some thrips trials I won't go into those. And I think maybe I'll hand over to you Lindsey. Did I forget anything that I'm supposed to talk about? Oh yeah, and we're seeing product shortages. Obviously input prices are really high, but we're seeing product shortages and it's there's silly things like really can't get inert ingredients, they can't find jugs for certain things. So I'm getting a lot of calls right now about switching, you know what they normally is so Quadris is used pretty extensively and even the generic

equivalents aren't available. So growers are calling asking for options for Rhizoctonia control and things like that. So Lindsey and I are kind of scratching our heads. And I know that that's going to get worse as we go through the season. So I think everybody needs to be prepared about not just having a plan A for what you're gonna do for pest management, but maybe a plan B, and a plan C for when you can't find those things that you're accustomed to just ordering and have it you know available the next few days or whatever. What else did I forget? This is why Lindsey goes after me 'cause she cleans up everything I forgot, so Lindsey.

Lindsey du Toit:

Thanks Tim. I don't have a lot to add for Tim, but certainly the heat that came early for us in the extensiveness of the heat, and the duration of it heat had a big big impact. I have not seen so much bacterial rot in onions as I have since 2015, when we had at that time the hottest, driest summer on record. This was even hotter. As Tim said it got to 117/118 F in the South part of the basin. North part doesn't get quite as hot, but it stayed hot for a long time. So I had started surveying for bacterial diseases part of the Stop the Rot project, usually I start in the Walla Walla area in early June 'cause they're a bit further ahead. But I had growers call me up as soon as we got about a week after that very hot period. And at one point a grower came to me, a Rep for a company came to me, and said there were five full circles so we're talking 125 acre circles of one variety and each had over 50% bacterial rot. I mean that's not marketable, you can't harvest it. So that's five times 125 acres lost within a week after the 117 degree temperatures.

So we had a lot of discussion about how do you keep up with irrigation, and a big driver of these bacterial diseases is moisture. And 80 plus percent of our acreage in the Columbia basin is under pivots, and splashing is one of the quickest ways to get moisture in the neck and splash up inoculum from the soil. And I had a very interesting conversation with one of my growers, as he used to have a lot of bacterial rot problems. And he said the key thing he's figured out and I was just telling Joe and Rod earlier that he'd learnt to back off his irrigation, with less frequent circles, or slower circles of the pivot, a little earlier to force that onion crop to root deeper.

When you get into those high temperatures in June/July, normally the crop is able to persist and tolerate that stress better, and you don't have to keep that pivot running like a racehorse around the track. So, I think there's something really important to think about as we get into more of this extreme heat, that if you can force that crop to be deeper rooted. We say onions are shallow rooted, but I'll never forget a message that Gary Pelter, who's a former extension agent before he retired, at one of my field days. He cut a profile in the soil in the variety trial and he showed the depth to which those onions had rooted. We were seeing roots 3 feet deep. That's not shallow rooted. We can make them shallow rooted by how we irrigate, especially in a semi desert climate. So I think there's a lot to learn. And Gabe and Tessa and others that did some, and Rob Wilson did some really important irrigation work around the Stop the Rot project. But I think there's also, under these extreme heats we're seeing in the Midwest, some approaches we might not have considered is how to force that crop to be deeper rooted so you can tolerate that stress better, and not have to under pivot, just get those necks saturated to

that degree. So that's really the big lesson I think we wanted to try and move forward with after the experience of Washington State's extreme heat. I think that's all I had. We didn't get any reports of fungal problems it was way too hot. Thanks.

From floor Christy Hoepting:

Bhabesh told us earlier that *Burkholderia cepacia* really likes it hot, and you have always said that *Burkholderia cepacia* is not one of your kind of rots, and I'm just wondering with that heat did you notice a difference in the species or the spectrum?

Lindsey du Toit:

So we're still working on all the isolations and identifications from the '21 season. But the *Burkholderia*'s as a genus Christy like it hot, not just *cepacia*, so *gladioli* likes it hot just like *cepacia* does. What we see is the *cepacia* tends to do better on the East Coast, Midwest States and I don't know if it's related to so much muck soil or what it is, but we do occasionally find *cepacia* (Peters occasionally found a bit), but it's very much minority compared to the amount of *gladioli* we find. So our predominant pathogen that we found over the years, that Mike and I have done isolations for about 20 years on onions, is *Burkholderia gladioli* and then *Pantoea agglomerans*. I'd say those are the two predominant over the years. We hope to get a better feel for that but *Burkholderia gladioli* likes heat, just like *cepacia*.

Wisconsin: Rod Gumz:

We had a pretty decent spring, and then around Memorial Day we had a frost. And it didn't appear to do too much, maybe hurt the stand just a little bit. And then we had a reasonable growing season and then we had, I wouldn't say perfect harvest, but what I would consider perfect for our harvest, in the fact that from August till October the end of October we didn't hardly get any rain and onions like it dry. And that's highly unusual for us because in '16, '18 and '19 we had some of the wettest falls that that I've experienced, and so crop was pretty good and it went into storage well and it's coming out of storage pretty well.

Peter Rogers:

And then at this time I'll ask, are there any industry members, maybe who span multiple states or even beyond the United States, might like to give an update on onion activities? Anybody?

I can talk to a few things out of what we saw in the Treasure valley this year which I will just sort of reiterate what we did see there. Among the trials that we had, we had a severe, severe heat that caused these plants to really be stunted, to die back earlier than normal, and you had quite a few stands that were dead standing up. And if it wasn't from Pink Root, it was from IYSV or from the heat, but that combination was fairly lethal. And I think you saw that across a good chunk of the western US onion growing regions this particular year.

And I would, may be a little bit alarmed, but it seems to be happening a bit more frequently over these recent 10 years. Let's say putting us in some precarious positions where we have to worry about drought, have to worry about high temperature, and whether we can irrigate during those periods. So you begin to see this kind of let's say temporal effect of things that are going on and things are in fact a little bit trickier for growers to succeed. So at this point I'll leave it at that.

What I wanted to do though was open it up to a discussion on the floor. I'm wondering are there any burning needs that either growers or the industry or others see as research topics? Any common interests that maybe anybody wants to discuss or bring up that could maybe feed into the upcoming 4008 work that we're doing? We're always looking for your input. We want to steer things towards what's going to have an impact on the farm so any burning discussion items or needs that we see? Bob?

Comment from the floor:

Yellow nutsedge? OK and you're seeing this as a as a persistent problem where the herbicides are not controlling nutsedge or are you seeing an increase in nutsedge causing problems in onions?

Bob:

Well you know the Outlook is doing a decent job, but typically it's been augmented by hand labor which is increasingly difficult to get. So there are limits to the amount of Outlook that can be applied and we just need I think a better a better alternative. I know that's a long-term approach but yeah.

James Woodhall:

Just two comments I just wondered if the switch to drip at least in the Treasure Valley you know whether that made the onions additional prone to the heat stress. I think Kayla and I both looked at historical data and it seemed like they seem to hold up a bit better when they're under gravity perhaps. So that's just one comment.

And then like in terms of needs, I was just wondering as a group whether we could sort of maybe standardize some of our methods you know, if there was a way we could share protocols, or how we assess our trials. And then we can maybe compare across trials a bit more successfully.

Peter Rogers:

Now that's a really good point. Any other comments on that? I do feel that this is you know particularly important as you start to compare apples to apples. You really wanna be speaking the same language about what you're seeing, and there are quite some diversity's in how we're looking at those.

Bhabesh Dutta:

Yeah we lack engineers. So for example how does different farm mechanization or now we're going towards our Smart farms, how does it impact overall in production, especially quality production. So right now we are struggling through the Stop the Rot team. We have this excellent observation that some mechanical harvesting has a good impact compared to manual harvesting, but we don't know the actual reason why. That different types of mechanical harvesting how do those harvesters perform with respect to the onion quality and so forth, so we don't have those. So another important aspect I don't know which may be too far is Climate and how does it impact all onion production? How does this changing climate impact? For example in Washington we had the forest fire. How does the smoke impact onions. Do we know? We don't.

Peter Rogers:

OK yeah that was that was also brought up by Bob passing time over here as well. What are the effects of smoke as we're seeing these increased forest fires across the West? OK thank you for that.

From floor:

Peter, is increased mechanization beyond the purview of the 4008? When I say that, I'm talking about things like mechanical weed removal, when we talk about mechanization we need to go to harvest. You know Georgia and maybe transplanting, the labor shortages, the labor cost, labor issues, is mechanization in all other angles of our industry and maybe that could have some consideration.

Peter Rogers:

It's a very good point and that's on my list here. I think automation and mechanization are going to really be the future in vegetable seeds going forward. We've got it looks like we may have some comments from online

From floor:

Yeah we have a question from one of our online participants said we would be interested in any research into treating bulb mite effectively.

Peter Rogers:

That could definitely fit into the entomology.

Lindsey du Toit:

I've had a couple questions from folks at the meeting today about bulb mites. Tim and Brian? They said no good options. Vydate right now.

Peter Rogers:

OK another great topic.

From floor:

I'd like to see more work on reduced carbon footprint and regenerative Ag kinds of approaches. I'm not aware of much that's being done there in any kind of vegetable production.

Peter Rogers:

A bit more sustainability.

From floor:

Another interesting topic may be the issue of soil salinity.

Peter Rogers:

Any particular aspect about it, just too much buildup of soil salts?

From floor:

Yeah due to water shortage. The fact that more and more growers have to rely on subsurface irrigation.

Peter Rogers:

Other discussion points? Another topic that I'd like to bring up to is how we finish the crop with irrigation is a constant concern especially from the West as we try to gain size on those onions. Especially in times when we have heat and already small onions we try to push on those onions late that can lead to some challenges in storage and we've talked about that as a common theme over the past years.

From floor:

Stop the Rot tomorrow section B1 and B2 from Gabe.

From floor:

So we've had several people in our industry ask how the new onion varieties, particularly those with very vigorous rooting system, how that is impacting water requirements and particularly nutrient requirements, nitrogen, especially expensive nitrogen fertilizer. Are we over fertilizing because we're assuming everything grows like Vaquero in our region rather than tailoring it to the new varieties?

Lindsey du Toit:

Brian's work showed you could cut back nitrogen fertilizer and not impact your yield.

Peter Rogers:

Any other topics, discussion points? Well that brings us up to about 4.30 pm here. So the next portion of this meeting I'd like to call Brian Nault up to the front to talk to us about the W4008 which has been recently submitted. Brian, thank you.

Brian Nault: W4008 Discussion:

This topic is actually covered really well Peter by yourself and by Lindsey. So I don't have that much to add to it but there were a couple items and I promise to make it short 'cause we want to move on. So first quick trivia, and no University people can answer. What does "W" stand for in front of 3008? Anybody? Raise your hand what's the "W" in front of 3008? Mike? Nope! Anybody else? OK I'll tell you, it's "West". Because these multistate projects come out in different regions in the United States. Way back when Howard and maybe Chris and others, Mike maybe you're part of that to, developed this project, it came out of the West region so it was given a W and then 1008 and it's continued. And obviously you don't have to be a resident of a University in the West, obviously because I'm from Cornell, and I'm a member, so it doesn't matter. But anyway, that's where that comes from, it's the West region.

The other thing is that even though the reason why this working group is so successful is because we're really diverse, we have folks from industry, we have onion breeders we have University folks, government folks, consultants we have a really, really diverse group. And we all have a common goal of helping US produce better onions right? That's why we're so good. But we won't have a W4008 working group if we don't have members. The only people that can be members are University folks. And quite a few of you have officially signed up to be members, but we need more and Tracy is gonna comment on this.

Tracy Dougher:

Sorry, your industry folks can be members, but you gotta do it through the universities so through those Ag experiment stations, yeah they can sign them up.

Brian Nault:

OK that's great. I did not know that. So anyway so in terms of becoming members contact the experiment station director in your State and if you don't know, find out. We would like to get as many of you all as possible as official members. The only other thing is, that I think this is relatively new, but the proposal will be reviewed externally, and there will be

feedback, and then that feedback will be used to revise the proposal. Also, some of the comments I heard just now will be addressed as well. We can't expand the number of objectives beyond what we have now, but certainly some topics could be enhanced a bit. So that's about all I have. Does anybody have any questions yeah, Bob?

Bob:

Would it benefit the W4008 if stakeholder companies were to join, like BASF or McCain, benefit the program?

Brian Nault:

Yes I'm looking at Tracy she's the one who makes the decision. Hey maybe I don't know do you like wine? We could make this real easy. But yeah sounds to me like the more the better. So there's a document called an appendix E for university folks that have to fill that out. It's not that difficult but for non university folks, it, that would not really apply Tracy so you can mention how that process would differ.

Tracy Dougher:

So they're gonna have to come to you and work through your Ag Experiment Station to submit it through your appendix E, through your Ag Experiment Stations.

Brian Nault:

OK alright. So yeah contact somebody you know for the State you're and they'll help you out.

Lindsey du Toit:

Even though it's proposal stage you can sign up now, please do.

Brian Nault:

Absolutely in fact probably better by when Tracy? When would be a good deadline? We work well with deadlines.

Tracy Dougher:

They're gonna start, so it's out for external review right now. So the external reviewers might be looking at that, but the the multistate review committees are going to be looking at it probably after mid-March so I think March 4th we're meeting, and then we're going to start looking at those proposals. So get them in, in the next couple of weeks. That'll help out when the multistate review committee meets. But I can also go make a plug for you that you're going to sign up, when we're in that meeting. I'm on the multistate review committee as it happens too. So you got an edge there.

Brian Nault:

I think we're in good shape. OK that all I have, any other questions? Alright.

Peter Rogers: Business and Officer Selection

Next up a little bit of business for the W3008, heading into the W4008. Currently we have a Chair, Vice Chair and a Secretary. As we move forward the Chair generally moves on to a sort of emeritus and support role, and the Vice Chair moves on to the Chair, and Secretary to the Vice Chair and then we're looking for a Secretary. So at this time do we have any volunteers or nominations for Secretary of the upcoming W 4008. Gabe? OK. Any other?

Lindsey du Toit:

He stepped out so we can nominate him!

Peter Rogers:

Nice job, good timing.

Comment from floor:

Each year on the committee is one year, so it's in essence a three year sentence. [Laughter] I know I'm sorry yeah.

Peter Rogers:

It's not a terrible amount of work, there are State reports, you have to keep up with correspondence, those types of things. But it is not a terrible amount of work, and you've got great support within this group. I mean honestly the researchers and the people who participate fantastic job they really make it easy to be on this this committee. Any other volunteers, more nominations? Beth?

Lindsey du Toit.

James? No? He wants Gabe.

Peter Rogers:

Good try Beth.

Lindsey du Toit:

Gabe's not here but...

Peter Rogers:

Could we have somebody second Gabe? OK, so barring no other nominations or volunteers,

Lindsey du Toit:

All in favor, all in favor? Any opposed?

Peter Rogers:

Alright motion granted. We will move forward, and I will inform Gabe of his new role. Thank you very much, excellent. Hey so at this time we're about to adjourn the session are there any other comments, any other statements anyone would like to make under the W3008.

Peter Rogers:

Oh the deadlines, great, call. So coming up here we're going to gather the State reports after this meeting. We have a 60 day deadline to deliver that to Tracy for final edit and submission. We usually like to have that in about 30 days or 35 days so we have time to make edits, shrink it down, and get it into that final pristine format. So, after we leave the meeting I will send out an email reminder to everybody to submit your state reports to me, and then as a group will work on consolidating those reports and submitting them to Tracy. So, we have 60 days we're on the clock at this point. So thank you, appreciate that Bhabesh.

Peter Rogers:

Next year's meeting? Well there is actually a follow up meeting at 4:45 after this where we'll be discussing the opportunities with NOAA, to possibly combine with NARC. Are there any other suggestions, or any other places that might like to host the NARC or the W3008 coming forward.

Lindsey du Toit:

The comment from Chris was that the NARC meeting is every other year, the W3008/4008 must meet every year to get our funding. I actually don't know how much the USDA gives each University but each University receives a set amount to pay for one person to go to the annual meeting. I don't quite know how much the Universities are pocketing, but it's required to have an annual meeting for the W multistate teams.

Peter Rogers:

Yeah, so if there are any suggestions, if someone would like to host that meeting. Feel free to offer that suggestion by email in person whatever.

Lindsey du Toit:

Usually the chair because the chair, the committee has a responsibility to organize it we let them make the first decisions 'cause they're taking that responsibility, but then also try to recognize moving it around so it's not always in the same region. Dave Burrell is the Chair stepping in after Peter. David you have a comment?

Dave Burrell:

Wonderful it's just a honor. It's a wonderful group to get associated with. Been hanging around onions for most of 30 years now and it's just been quite amazing to watch the progress of the collaboration that occurs. So look forward to another successful year. The Pacific Northwest vegetable growers association seems to be, a lot of the participants are in the West Coast, so I would suggest that as a consideration.

Peter Rogers:

Yeah, that's a fair consideration

From floor:

We have an issue, that meetings in November. So that would put us with two meetings in one calendar year, is that gonna be a problem or not? [unintelligible]

From floor:

OK that didn't last too long.

Lindsey du Toit:

Christy. How about Great Lakes Expo, I mean not Great Lakes Expo, New York Empire, sorry the New York Empire meeting that you have in January?

Lindsey du Toit:

Alright let's scratch that one. I was thinking we usually try and combine it with an existing meeting so that, you know, for people who already having to travel, less travel expenses. Not one less meeting.

Lindsey du Toit:

Just the W3008, not NARC. Now Georgia you guys.

Bhabesh Dutta:

Yeah we have Southeast fruit and vegetable conference first week of January usually, so that would be a perfect venue, Savannah would be a perfect venue. January, 1st week, January 1st week. So we can do a conjoined meeting there. Fantastic meeting, you're right. And we have nearly 4000 attendees this year. So it's a big, big meeting. We have people from Canada and other countries also join that meeting. So it's a great venue, great culture, and Dave is close to Savannah so being a President it's a natural choice. Oh yeah Brian is also there plus we also have a good team of growers who will help us out. Committee will help us out too.

Peter Rogers:

So we have a good prospective offer here from Savannah. So we're going to stick around here and we're going to have Greg Yielding. Mike Havey's gonna say a few words about the interaction with NOA anyway, and the opportunities with NOA as well. So we may have some potential options. We'll keep you informed of how things look like going forward, and maybe we'll have to have an arm wrestle or something like that over the next location, we'll see. But before we go, and I turn it over to Mike Havey, I would like to say thank you, especially to Heather, especially to the organizing committee Mike, Lindsey, myself and the others that all participated in this. Fantastic job really, really appreciated. Let's give them a round of applause. I'll make an announcement, you have the opportunity to go down to the fruit and veg meeting, there is the conjoined banquet that is ongoing right now at this moment from 4 till 6. So, when we're done here with this discussion please join us down at the lower level, B level with the fruit and veg conference. So thank you to everybody for joining us and I will turn it over to Mike Havey.

Lindsey du Toit:

For the reception it's a cash bar, it's not a banquet it's a reception. So don't expect a sit down meal, but we're entitled to the food.

Mike Havey:

My interest just plummeted! So little bit of history since we talked about W series and the NARC the National Allium Research Conference meets every other, has historically met every other year. We lost one due to the COVID. It started out in 1978 in Colorado as a seed production meeting and has gone on every two years essentially since then.

About 20 years ago NARC started meeting with the NOA, the National Onion Association and Wayne Miniger was very instrumental in building that relationship Wayne has obviously retired and Greg Yielding is now executive secretary of the NOA. Greg should be joining us online. He couldn't be here because NOA is right now in DC, lobbying for all of us. Is Greg online? Not yet, well we'll see if he joins us in the next few minutes. The question is, is that we've had numerous meetings with NOA, the one in Madison in 2019 was with NOA. I personally feel it's very beneficial because it maximizes interaction with the growers, and so we have our NARC session with research and then the NOA sessions and there's free movement between the two. Greg is interested in fostering that, and so we'd be looking to plan the next NARC in 2024 in two years, and Greg is interested in working with the NARC group to have the meeting with the NOA.

The NOA has met recently and was supposed to meet in Bermuda, but that was cancelled 'cause of Covid, Puerto Rico and Hawaii, and I can tell you from the USDA perspective when you put in to go to a meeting in Hawaii, that doesn't go over very well. So Greg is willing to work with the group as they plan their meeting to make it more accessible in the continental United States. But this has gotta be planned relatively soon. So I guess the question, if Greg is not able to join us. OK it looks like he's, he may not be able to.

Do we want to, in two years, so we invite W4008, the NARC and the NOA to consider meeting together at an unknown location right now. But with the NARC. And it will be a Western, most likely western region, or Midwest. I should point out that the NARC is usually in December because that's one of the times that we can all get together where we're not planting or harvesting, and the winter meeting with the NOA works really well because they meet that same, roughly the first week of December. So I guess the question is, is that we as a group NARC, which is, there's no there's absolutely no formal structure anybody can be a member, but we generally vote as a group, do we want to meet independently and then we would ask somebody to come forward and organize the meeting in two years, or should we give a green light to Greg and say that in 2024, depending on where it is, and the virus and everything, that to meet with NOA? And so I'll open it up for discussion.

Some people, I really benefit from meeting with the NOA, but others like maybe the research community to meet more independently once in awhile. But we'll open it up to the floor and I'll communicate any comments to Greg. Ultimately I'd like to have a vote whether the group supports the 2024 meeting with the NOA, or if somebody comes forward to organize it we could vote on that. But we have to have marching orders today, because we have to make plans, so I open up the floor.

From floor:

Hanna Pappu was online. He said his vote was to meet with NOA.

Mike Havey:

So how many, just raise your hands. How many are in favor of in two years working with NOA to meet jointly?

Lindsey du Toit:

December 2024 just the microphone for the zoom folks.

Mike Havey:

So, to be jointly with the winter meeting NOA December 2024. Alright thank you, we won't ask anybody to vote against it. But if you do vote against it, I would suggest you become the candidate to organize the meeting. So anybody like to organize the 2024 NARC meeting, I will communicate this to Greg. Thank you. Let's go downstairs.

Dan:

I was hoping Mike might have some inside information about the status if there's going to be a next international symposium.

Mike Havey:

So yeah, there is an international meeting that sanctioned by the International Horticulture Society. I don't know if many of you got the email. It will be a virtual meeting in Croatia, I think May of this year. I'm not sure how virtual meeting is gonna work. The sponsor is actually the Croatian tourist industry not an onion group, is that not true? That was my understanding. So that meeting will occur, and then there will be a decision made about the next international meeting which is generally in four years, so that would be I guess 2026, and they would decide at that time. We have sponsored the international meeting in Madison in 2019, so we had the NOA, the NARC and the international meeting. So, nobody is traveling, it would all be virtual.

Anything else, otherwise we'll stand adjourned. So tomorrow we start at eight o'clock sharp in this room for the Stop the Rot presentations.

End of Minutes / Transcript