Cutting Edge: In Search of New Crops For Wisconsin

Hazelnut Field Notes with Jason Fischbach

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SPEAKERS
JASON FISCHBACH

JASON FISCHBACH 00:00
This is a podcast about new crops. You're gonna love it. Join us on the cutting edge, a podcast in search of new crops for Wisconsin. (music) Welcome to the cutting edge podcast in search of new crops for Wisconsin. Today we mix up the format a little bit and bring you what we call field notes. These are excerpts from our researchers and partners in the field working on some of these new crops and they'll bring you some up to date current information direct from the field. Hope you enjoy it! Hello Midwestern hazelnut growers. This is JASON FISCHBACH. The agricultural agent with Ashland and Bayfield County UW Extension, and it is July 27. And one of the more exciting times for me in the world of hazelnuts because the hazelnut clusters on the plants are increasingly visible as they mature and grow in size. And it's the time of year usually around the first week of August that we do our yield ratings, and I'm in my own personal planting here. My home farm near Marengo got a couple hundred bushes all seedlings, meaning each plant grew from a seed, which means every single plant is genetically unique and that almost always means every plant looks different. Some plants have a lot of nuts, some plants have almost none, which is kind of the dilemma we have with these seedling plantings. The research has shown on average, the yields from all these seedlings in a single planting just aren't quite enough to make for a commercial venture. So, that said, as a hobby, or as you know, as an early adopter, getting started growing these seedlings is certainly fun. And it certainly provides you with a lot of a lot of nuts that you can use on farm or work with other growers start to pool that volume. Anyway, so it's early, or it's the end of July. And what we do in our research plantings and as a, you know, hobby grower at home, what I like to do is do some visual yield ratings of the plants because what I'm trying to do is find one or two the top plants in my planting that look good. And that's exactly what we do in all our research plantings too. We are trying to track the performance of these things. And the question is, well, what are we looking for? What are we looking at? When I'm looking for is a couple of things, right? I'm looking for plants that as they mature, they're holding their branches somewhat upright. If they're all floppy on the ground, it's gonna make it a challenge to harvest either by hand or mechanically. Now that said, if they're standing straight up, right, they probably don't have any nuts on them. And that's not good either. So I'm also looking for, obviously, lots of clusters. And you're going to see in the germ plasm, or your seedlings as you'll have some that might have 7, 8, 9 nuts per cluster. And most likely, those nuts are really small. It kind of harkens back to the American hazelnut

parentage that's in a lot of these plantings. Now, if you do find a huge cluster, and the nuts are really big, say as big as the end of your thumb, call me, we're interested in those plants, for sure. But generally, if you find nut clusters that are that big, that's a plant that's interesting, it's showy. And when those clusters turn red in the fall, it'll look pretty but from a nut production standpoint, they're just a little bit too small. So we're looking for clusters that are like three to four, sometimes two, if it's just one nut per cluster, which the nuts tend to be pretty big. Anyone that's hand harvested, knows that that's quite a pain to pick all those tiny little or those one nut clusters. The other thing is we tend to find the detachment force. So the amount of force it takes to pull that cluster off the plant, when you just have one nut per cluster, it definitely seems like it's harder to pull that off. So if we're doing mechanical harvest, especially in the Midwest, where we're looking at harvesting the nuts directly from the plant, as opposed to letting them hit the ground, it's going to be a challenge if those things don't come off when we drive the harvester over. So anyway, here's the plant I'm looking at right now. Too bad for you, you don't get to see it. But trust me, it's a nice looking plant. It's got you know, I'm, I'm poking around here, I've got three pretty consistent nuts per cluster. Here's a four, here's a two, but generally, it's nice. Now the other thing I'm looking for here is cluster density. We use a rating system, a visual cluster density rating system. And this can be a little tricky, because some of those clusters that have lots of involucre are kind of show offs. So they grab your eyes attention and so you might over think there's more nuts there than there actually are. So you're really trying to look at on a given branch, how many clusters are on that branch? And then how many of those branches on that plant? Walking around the whole plant, if you can, how many of those branches have a bunch of nuts on them? So we use a rating system zero through five, zero would be, there's no nuts on this plant, I cannot find a single one versus a one which would be okay, I can find at least one nut but it's, you know, here, there, scattered. Really nothing going on here. A two would be alright, here's and we typically see this. Here's one branch that's fully loaded with nuts. That might be the oldest branch on the tree. And this happens a lot, especially around the bush, especially when the plants are young, say age three or four. So that'd be a two. There's at least one branch that has a lot of nuts on it. All right, a three. And I'm looking over my shoulder at an approaching thunderstorm. Maybe you'll hear it. The last thing we need up here is more rain right now. But here it comes, it's about eight in the morning, by the way. So the three would be okay, here's the plant that's got nuts pretty uniformly scattered across. There's not, you know, this is again, a subjective visual yield rating. But with three, it's not astounding, right? It's just a good solid, even evenly distributed nut clusters you might have on a branch, you know, this one I'm looking at, I've got three or four on this branch, and I've got five or six on this branch. Okay, so that's a three. A four would be every single branch has got lots of nuts. And what do I mean by lots of nuts? Well, if you look at each little branch that comes off the main branch, each one has a couple of clusters on it, right? So it's, it's more than a three. Here comes the rain. I'm going to duck into the greenhouse here so I don't get actually I'm going to run into the barn. This one looks a little more serious. All right, I made it back to the barn. We're gonna ride out this rainstorm. You know, the barns of yesteryear with the solid roof in the haymow you could dash into it and it wouldn't be very loud these days in these tin sheds. You go in there, you can hardly hear anything. I haven't heard any Thunder or lightning yet, just lots of rain. So where was I? So four would be, you know, again, this is subjective and it's relative, right? So four would be plants, every plant that's got, or every branch that's got nuts on it, lots of them. And it's more than three. Okay, five would be exceptional. This thing is fully loaded with nuts and you're only going to have a handful of five per planting and you save that rating for the plants that just look astounding. Again, not necessarily the big showy clusters, you got to look at a particular branch and then branches on the

shrub, do most of the, those branches have nuts on them? Or where they could be on those on those side branches? Okay, so we do this in all our plantings our research plantings, we do this, you know, hobby growers, we're trying to get them to do it. And the goal is basically twofold. One is to just see overall, how your planting is doing. If you've got all zeros and ones, well, something's not so good. If you got all fours and fives, you know, you've got a pretty good planting, right? But we use it just as a tool to then guide where we're going to go back and do a more detailed harvest and analysis because the yield rating again is subjective. It doesn't tell us how much kernel is produced. One thing you're going to find is you might have a plant that has a really high cluster density, but when you go back and you harvest that plant and you crack out all the kernel, you realize, wow, there's a lot of clusters but those shells are really thick. The nuts are pretty small and the kernal yield on that plant is just not all that exciting, right. So that's why it's so important if you're trying to track and find the best plants in your planting to actually go back and harvest those. So we all have limited time and resources ourselves included, so we tend to just harvest the fours and the fives each year. And that's what we use, as we make our decisions on selecting plants for potential non glaring for further evaluation or maybe even for breeding purposes. Now, you might ask as a hobby grower or small scale commercial why I would take the time to do all this right? Well, you keep in mind, we don't yet have any proven cultivars for Midwest production. And so we're really asking everybody that's taking the plunge of growing hazelnuts with these seedlings is to at least pay attention to try to find those top plants. You know that the chances are low but you could have a superstar plant, and by keeping track of it that helps us find it. Now, just because it's good on your place doesn't mean it's good everywhere. So the next step, once we find a great plant is to mound layer, it meaning to make some copies of it and evaluate at different locations. If you're just growing hazelnuts for the hazelnuts and could care less about the breeding stuff, that's fine, then you don't need to keep track of all this data. The other thing you might do, you might not be interested in creating new clonal varieties, but you could mound layer your own plant that you found is really good and use that to build out your planting. It's gonna take time, but it's certainly an option for you. So the question of nut size is a good one, right? We're all kind of drawn toward the hazelnut clusters that have the really large nut size. For whatever reason, I think, partly it's because the Oregon industry and the European hazelnut has sort of set the standard because they're germplasm, the European hazelnuts tend to produce larger kernels, right. So we're kind of comparing. But at the end of the day, the question is, what is your market looking for? And if your market is looking for kernel that can be squeezed to make to get the oil out and turn into flour as the byproduct. Or if they're chopping it up to turn into whatever product well kernel size isn't quite that important. And what the markets will tell us is, the flavor is important. The quality in terms of post harvest handling is important. The shape of the kernel is important so that you can have an even roast when you put it through roasting machines. And that kernel size, for some markets, for sure is important. But generally, it's not the end all be all. So you don't necessarily have to have a plant that has enormous nuts on it. So but you also on the other side, especially when we're at a kind of small scale, that when you do start cracking hazelnuts when you're separating out the last of the kernel fragments from the the or the shell fragments from the kernels, it's usually done by hand. And when you've got really small nuts, it's just really hard to do. Now as you get larger scale you might have a color sorter or fancier technology. In which case, you can do it all mechanically, and it's not that big a deal, but ignore the ones that are super tiny. And the ones that are super large, well, it's great. But generally, you're gonna find I just got hit by a cold raindrop that hurt, it was cold, the largest ones tend to not have very many nuts per plant. So you might end up ignoring those. Alright, so the other thing that you're in your planting is, how are you keeping track of which plant

did well the year before and the year before that, right? Cause sometimes it can be hard, especially as they start to get bigger is did I remember was that plant good last year or not? So how are you gonna label these things, and there's a couple different strategies, some people will just put a row marker at the beginning of the row. And then each plant is most likely evenly spaced, let's say every six feet. And so there's a position in the row that has a label. Let's say it's row a, that's Plant one. Let's be careful here. It's not necessarily plant one, but it's position one, position two, position three, position four. Ideally every position has a plant in it because they all survive, but ultimately you're going to have a dead plant. So if you're just counting plants and one dies, you might end up getting screwed up in your row. So we tend to use a position in the row. So A-1, okay, there's a plant there. And we know you know, we keep track of that plants characteristics. A-2 there's another plant and one tends to be taller and wider and bigger plant but no nuts ever. Plant three. This thing is short, compact and full of nuts every year, I really like it. Position four is dead. So on my map, it just shows an X on it or dead or you might have an indication of when it died or what if you know how it died when it died of. Okay, so that's one way to keep track of it. Other people will start there have a permanent monument at the start of the row and use a tape measure and the plant position is the feet and inches down that row. So this is plant 45.15. This is the editor jumping in on the podcast here 45.15. That's a terrible example. It should be feet and inches. So 45.6 would be 45 feet, six inches. That's a much better example. But we'll just have to suffer through this clown with his 45.15 example. But you get what he means. So it's 45 feet Point 45.15 feet from the real monument. And that's the way that you'll, as long as that permanent monument is there, you'll never lose where that plant is, is positioned. Now some people will just have flags a surveyor flagging on their plant, and so they might flag all their fours and fives every year. Problem with surveyor flagging is that flagging disappears. And if you write on it, the writing fades. So we've had a lot of people that thought it was a good idea and it looked good after their first year, all their fours and fives have a blue surveyor flagging and then the next year, they maybe use pink. But eventually they start to fade and disappear. And now you really don't have any good tracking system. So we recommend either using that plant position system or the the feet, foot row position to keep track of things and then you've got a, you know, a spreadsheet or some other way to keep track of track of the information. So we won't you know, in our when we do our initial evaluations of plant material, we would like to see three good years of nut production, before we make any decisions, and especially with this hybrid material that can be variable from year to year, sometimes, we that usually would be if all goes well, year four, year five, and year six is when we get our first real nut production. And the rain is finally caught up so I'm going to duck into my high tunnel. That's what you hear over head. And year four, five, and six gives us a pretty good indication if it's not producing by year four, we're really not that interested in it because we need a plant that's precocious. Time is is money and when we put plants in the ground and aren't getting any revenue from those plants, that's just accruing an expense. So this is one of the challenges of hazelnuts is the big upfront expense of the establishment and maintenance before you get any positive cash flow. And so if we're waiting through year five for the first harvest, that's not good. So we'd like to see production year three. year four. Of course, a lot of that's going to depend on how old your plant is when you put it in the ground. We're trying for keeping the cost down to have one year old plants. So if we get production off a one year old plant in year four, we're pretty happy. Sometimes you'll find that the plants that have more of a European growth form and across your planting of American and hybrid plants, you're going to have some that look more European than others. Those tend to delay they're nut production. So you might not get good production til year five, year six. Now we've seen in some of our plantings, there's a plant that looks like it does nothing for the first seven,

eight years, then all of a sudden year nine, boom, huge production. That's great, but nobody can afford to wait around that long except if you're a hobby grower or something. So one other reason that we do these yield ratings in the try to do it the first or second week of august are the the critters they tend to leave the nuts alone until they're ripe. For me, my main pest are blue jays. I'm out in the middle of a field and don't have a whole lot of red squirrel or chipmunk predation. If you live next to a wood line. You're going to have lots of rodents coming to steal, steal nuts, but for me, it's blue jays and they won't really show up in the planting till the nuts are ripe for me up here by Marengo, Wisconsin usually that's the end of August early September. So if you wait to do your yield ratings till harvest inevitably you're going to have some predation. And now, you don't really know how good that plant is because you didn't get to see it. Before all the nuts started to disappear, which raises another subject, when should I start harvesting? Right? So the rule of thumb is, when the nuts are loose in the husk, then it's okay to harvest that, that cluster. If they're still firmly attached, when you pull off that cluster, they're gonna stay firmly attached to that husk, no matter how much you dry it and bang it around and try to scrape it off. We call those stick ons. And they're a nightmare for post harvest processing. So you wait til those nuts are loose in the husk, and you can, you know, open the cluster up a little bit and try to pry it around with your thumb. If it's loose, it's ready. So with seedling plantings because they're all different, that means they're all going to ripen at different times. And you really need to start checking plants in for sure that by the last week of August, if not sooner, and once that plant is ripe, harvest it, if you do that, you will keep ahead of the predators that are stealing those nuts. Okay, if you wait to the last plant, that's ripe, you're gonna have one plant to harvest that year, the last one. So that means, you know, it depends on if it's warm and dry, things start to mature pretty fast during this in the fall, but you're probably going to harvest a couple times a week, starting in August, then through September, and just trying to stay ahead of the predators or the critters as those nuts ripen. It's a definitely a challenge that we have from a commercialization standpoint of trying to grow seedling hazelnuts. You know, hand picking at any scale is really not doable. So we need to do it mechanically with harvesters. And if every plant in the row is mature at a different time, it's going to be a challenge to do that. You don't you just can't afford to run a harvester through there multiple times. do too much damage to the plant and it's just not efficient from a labor and cost standpoint. As you go through this harvesting process, through the years, you're going to start to learn which plants tend to mature when because any single plant tends to be, at least relative to all the others in your planting will mature about the same sequence. So once you kind of learn your planting, then you'll know where to target your harvesting efforts. And it goes a little faster. That first couple of years though, as you're learning what your plants are doing, that can be a little bit of a challenge. The other thing I'm always looking for when I'm scouting these plantings in early August is the wildlife you probably will maybe flush some nesting birds. You know, I don't know if I ever have that late into the year but you'll find nests. Now I'm not really a bird guy, but I've seen some pretty cool stuff here in these hazelnut plantings one time I came across this mouse that was impaled on a stick What in the world? Well, it turns out that was a northern Shrike, which they love shrub land habitat and they find their prey they kill it and then they'll impale it on sticks in the branches in the hazelnuts and come back and eat it later. I've also seen woodcocks which if you've never seen one, it's got the longest snout you'll ever beak that you'll ever see. So that's one great thing about hazelnuts is bring back the wildlife. Also be on the lookout for bald faced Hornet nests. They love to nest in these hazelnuts a lot. Ah, hell I just got stung, ow! Just kidding. That's just, you know, a little warning to watch for those bald faced Hornets. The last thing you want to do is in during harvest season to stick your hand in the plant and now you're in trouble. So look for those and get rid of them before you harvest. Well, I think that's it for

today. Thanks for putting up with my ramblings and be sure to look for other field notes on other new emerging crops through our podcast, cutting edge In search of new crops for Wisconsin Brought to you by the University of Wisconsin Madison- Division of Extension.