Midwest Nut Producers Council Journal

The Newsletter for Professional Chestnut Growers in the Midwest

In this issue...

Rogers Reserve at Michigan State University

@MIchestnuts

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Important meetings for chestnut growers, mark your calendars

Chestnut growers are encouraged to attend the upcoming MNPC Harvest meeting. It will focus on cultivar evaluations and chestnut blight research. The meeting is free of charge but requires registration (see information below).

Harvest Meeting of the Midwest Nut Producers Council
September 7, see details of time and locations below
Clarksville Research Station and MSU South Campus

The Midwest Nut Producers Council will hold its Harvest Meeting, Sunday, Sept. 7 at noon at the Clarksville Research Center (9302 Portland Road, Clarksville, Michigan 48815). After meeting in the parking lot (restrooms available), we will proceed to the chestnut plot to look at the various cultivars and review past production records. We will informally discuss the 2013 Forrest Keeling transplants, the 2013/14 winter and the effects it had on the various cultivars including flowering and pollen production. We will also discuss the Forrest Keeling 2014 transplant shipment arriving this October. There will be no formal presentation in the auditorium at this meeting. There will be light refreshments available (water and granola bars, so bring your own food). This event is free of charge to all interested parties but participants should register at http://events.anr.msu.edu/Chestnutharvest2014/ or by contacting Dennis Fulbright at fulbrig1@msu.edu. Midwest Nut Producer Council members will receive written packets of information at the meeting.

After the Clarksville meeting, you are welcome continue the Harvest Meeting by driving to the MSU south campus to observe even more cultivars and the chestnut blight treatment research program. MSU has chestnut blight and Clarksville, as of this summer, still does not have chestnut blight, so we will travel from the blight-free plots at Clarksville to the blighted plots at MSU. It is a 45-minute drive to MSU from Clarksville. The meeting will begin again at MSU at 3:00. Written driving directions will be provided at Clarksville if you wish to go to the MSU chestnut orchard.

Clarksville Research Center Address (Noon to 2:00pm)
9302 Portland Road
Clarksville, Michigan 48815

Exit 59 off of I-96, go south to Portland Rd. (about ½ mile) and turn right. Proceed to the main entrance on Portland Rd. (Meet in main parking lot and prepare to move to the orchard).

MSU Research Plots
Meet in the parking lot of the Plant Pathology Field Laboratory
3:00 to 5:00 pm

Take US127/I-496 south to Jolly Rd exit. Turn left at exit (you are not at Jolly Rd, yet). Cross freeway and head to signal at end of road. Turn right at this signal; go to signal at end of this road, (this is Collins Rd, you go by Lansing main post office). Turn left at end of Collins onto Jolly Rd. (Finally!). Drive to the next signal and you are at the corner of Jolly and College Rd. Turn left and go to first building on left, the Plant Pathology Research Lab.

Rooting Cuttings of Chestnut Cultivars

June 2015 meeting planned

At the Midwest Nut Producers Council (MNPC) spring meeting held in March, it was determined that MNPC treasury funds should be used to support a meeting about rooting chestnut cuttings. We have made some inquiries to colleagues in Italy who research and routinely use these methods, and they are planning on presenting the details of their work in June 2015 in East Lansing. Plans will be formalized after the Italian chestnut meeting in Sept., and I am sure the meeting will be at Michigan State University (MSU) or the Rogers Reserve in Jackson. We have already begun preparing the plant materials necessary to demonstrate these techniques. If successful, the trouble of grafting can be avoided; however, it should be noted that only certain cultivars are capable of being rooted. We hope to use the MNPC funds to bring in the European experts and prepare the special media needed. If we can get this method to work, nurseries must still grow the rooted material to the plant stage where the roots get large and fibrous before the plants can be placed in an orchard. This would still be considered an experimental procedure as the trees may not be as robust as grafted trees. It should be noted that many trees in Europe are routinely rooted instead of grafted and that there are still grafted trees only because certain trees cannot be rooted (Figures 1 and 2).

Plans are to offer free meeting registration to MNPC members (covers the cost of lunch). The meeting will probably last four to five hours based on earlier discussions with the Italian researchers. Stayed tuned for more information.

Figure 1. A European X Japanese hybrid cultivar 'Marigoule' in a Turkish chestnut orchard. This tree is from a rooted cutting. It is 24 years old and produces as well as grafted trees. The scars resulted from attempts by the chestnut blight fungus to infect the 'Marigoule' germplasm. I was told that good yields of high quality nuts are common from this orchard in the village of Cumalikizik, near Bursa, Turkey.

Figure 2. An orchard full of 24-year-old rooted cuttings of 'Maraval' and 'Marigoule'. Production is high and trees are flourishing on their own roots. This orchard is in the village of Cumalikizik, near Bursa, Turkey.

Michigan Fresh: Edible Sweet Chestnuts

New handout available for consumers

Chestnut growers, distributors and retailers have a new resource available to help consumers select, store and prepare fresh chestnuts.

Information presented in the three-page fact sheet, "Michigan Fresh: Edible Sweet Chestnuts" (E32313), will help consumers distinguish the difference between edible and poisonous chestnuts and offer tips on choosing the best chestnuts at grocery markets and roadside stands, storing chestnuts for maximum quality, and preparing them in the oven, microwave or over an open fire.

The fact sheet is part of the Michigan Fresh series. Print copies can be ordered from the Michigan State University (MSU) Extension Bookstore. A free PDF can also be downloaded from the same website.

Severe winters can be learning experiences

By MSU Dept. of Plant, Soil and Microbial Sciences Professor Dennis W. Fulbright, Rogers Reserve Farm Advisor Mario Mandujano, and MSU Research Assistant Daphna Gadoth-Goodman

While we hate severe winters, we cannot avoid them and we can learn a lot of useful information from the experience. Now that we have had a chance to survey the state from top to bottom, we believe that we can make some statements about the winter damage on chestnut in Michigan. Trying to make sense of the responses of the various trees in diverse areas of the state does not always appear to make sense, but we do try to observe patterns because patterns might lead to a better understanding of cultivar responses to winter weather events.

Figure 2. 'Colossal' chestnut trees planted in 1997 near Leland, Mich., as pictured in spring 2003 after the cold winter of 2003. Many of these young trees were killed or set back significantly.

History

Since the early 1990's, Michigan (and other states) has experienced severe winters every 10 years or so years: 1993-94; 2002-03, and now, 2013-14. The very first European X Japanese hybrid cultivars 'Colossal' and 'Nevada', were planted in Michigan at the Michigan State University (MSU) Southwest Research and Extension Center in Benton Harbor in 1992. Only one year later, the young trees experienced the coldest temperatures in the history of Michigan temperature records. Yet, two years later, the four-year-old 'Colossal' trees were producing their first pound of chestnuts. It was a very impressive display for such young trees struggling in their new-found Michigan home after spending their first year in California. That 1994 cold snap still holds many of the records for absolute lowest temperatures recorded in Michigan and the longest number of days in a row with below zero temperatures. We learned that 'Colossal' could survive those temperatures, but it was based on very few trees; moreover, we learned that other trees struggled to survive, and many died. For example, it was in that winter of 1993-94 that 50 percent of the 'Nevada' trees died, a harbinger of things to come for that European X Japanese cultivar from California called 'Nevada'.

Beginning in 1997, Michigan growers started planting 'Colossal' and 'Nevada' trees in new orchards across the Lower Peninsula. In 2002, Michigan's Lower Peninsula experienced an early spring hot spell. The first week of April had high temperatures in the 70's, 80's, and even close to 90, and trees pushed buds. However, less than a couple weeks later the low temperatures were dropping to freezing and by May 19, the lows dropped into the tree-damaging 20's. Frosts like that have been repeated since then, but that was the first severe spring frost that damaged so many 1997- to 2001-planted 'Colossal' and 'Nevada' trees. But that story does not end there.

Figure 1. Late spring photo of Chinese chestnut seedling trees in Eastport, Mich., after winter of 2003 killed several.

After that frost, the trees re-leafed late. Growers gave those trees lots of tender-loving care, all for naught, as once Nov. arrived in 2003, another weather event crushed the trees. Temperatures abnormally warm for November (high temperatures in the 60's) came to a quick and sudden stop on Nov. 15 when the temperature dropped from a string of daily highs in the upper 50's to a low in the mid-20's in a matter of a few hours. The trees that had re-leafed late in the spring of 2002 had now suddenly run into a "wall", the "wall" being the beginning of a seriously cold Michigan winter. Many of the trees were too green and energetic and, as bad luck would have it, the winter of 2002-03 struck, it struck hard and fast, and it stayed that way. By the time we came out of that winter, the trees looked horrible: Chinese, Euro X Japanese, it didn't matter. And to make matters worse, we were hosting the 2003 Northern Nut Growers Association summer meeting in July with orchard tours scheduled for chestnut farms and cultivar trials. The trees looked as if they were in a Hollywood movie set for a war landscape (Figures 1 and 2).

What did we learn? We quickly learned that the 'Nevada' and 'Silver

Severe winters can be learning experiences (Continued)

Leaf' cultivars that Fowler Nursery in California had sold us to provide pollen for 'Colossal' were too cold-sensitive. Both 'Nevada' and 'Silver Leaf' could not easily survive in Michigan. They needed to be replaced. We learned that even though damaged, 'Colossal' would quickly grow back and begin producing nuts a year later, and a couple Chinese cultivars like 'Benton Harbor' also could grow back. The 'Labor Day' large mother tree (ortet) survived (we had no grafted trees of 'Labor Day' at that time). Unfortunately, we replaced 'Nevada' and 'Silver Leaf' with a pollinizer called 'Okei', which also ended up being too winter-sensitive. We are now relying on mostly 'Labor Day' and 'Precoce Migoule' for pollination duties, and we went into this winter with these two cultivars, newcomers to the Michigan commercial chestnut orchards.

Winter 2013-14

Until about four years ago, we had only been transplanting chestnuts in the spring. Once we started working with Forrest Keeling Nursery, we initiated fall plantings and had extremely young 'Colossal', 'Bouche de Betizac', 'Precoce Migoule' and 'Labor Day' trees planted around the state that were transplanted in the fall. In 2013, some of those transplants had been transplanted less than six weeks when they were struck by the cold, ice and wind of an early and severe Michigan winter (Figure 3). As one grower observed, at least there was a lot of snow covering the young transplants and most of the transplants survived buried and protected in the snow. In some locations, the fall transplants survived with greater than 90 percent survival and in other locations, survival was as low as 60 percent. It should be remembered never to order and transplant all your trees in one year, because just as there are good grafting years, good yielding years and good growing years, there are good planting years. 2013 probably will not be remembered as one.

It seemed as if older trees should be large enough to handle the below zero temperatures, but did they? It is easy for trees to develop broken vasculature (vascular systems) allowing air into the vascular system, destroying water and sap flow. So, we were expecting some death, some sprouting (which follows vascular breakdown), lots of catkins and some collapsing trees. This is what we saw in 2003. But how much would we see in 2014, and where?

Survival data is now submitted and it has many surprises. The overall cultivar survival winner was 'Labor Day', one of Norm Higgins' favorite trees that we added to our "suggested list" of cultivars to plant a couple of years ago. Not only does it produce copious pollen, set a good nut, and produce a good tasting averaged-sized nut in late summer/early fall, we now know it will thrive in extreme winters and begin pollinizing in the orchard when other cultivars are still licking their wounds. Planted for its pollen production and its ability to pollinize 'Colossal', it needs to be added as a major pollen source to all European X Japanese hybrid orchards for its ability to produce pollen and withstand extreme cold and long winters. It certainly needs to be in all orchards in the coldest areas of Michigan, especially up north where the nuts will fall early. However, it should not be added to a Chinese chestnut orchard as it can induce internal kernel breakdown (IKB) in Chinese chestnut.

Figure 3. Photo of 'Colossal' transplant near Pawpaw, Mich., taken in early spring. This transplant represents a typical example of transplants pushing buds after the severe winter of 2013-14. Winter struck these trees hard within six weeks after planting. Today (Aug. 1), they have been pruned and look fine, ready for another winter.

We also learned that Chinese trees survived better that some European X Japanese hybrids such as 'Nevada', 'Silver Leaf' and 'Okei' ('Okei' is actually a Japanese X chinquapin hybrid). On the whole, Chinese chestnut survived the extreme cold of winter better than 'Colossal'. That is not to say that I did not see dead, dying and damaged Chinese chestnut; I did, but it was rare and usually up north beyond the 45th parallel. Chinese chestnuts in the past have struggled more with spring frosts than 'Colossal', but based upon the winter of 2013-14, Chinese chestnut did better than 'Colossal'. In terms of what has been more frequent in recent years, dealing with spring frosts seems more important, but if an extreme winter kills the tree, then spring frosts are a moot point.

Other European X Japanese hybrid cultivars did better than 'Colossal' and that is good news for the future of chestnut in the state. 'Precoce Migoule', 'Bouche de Betizac' and 'Marigoule' (only a few of these are currently planted) and some other

Severe winters can be learning experiences (Continued)

tested cultivars did well. Some branch death was common on 'Precoce Migoule' and 'Bouche de Betizac', but they mostly survived without much damage. Only a few 'Marigoule' are found in the state, and they all survived without any observable damage.

Why did the 'Colossal' struggle? I have been trying to figure this out. Most 'Colossal' trees in the same orchard survived and exhibited the exact same response, that is, three to six buds at the terminal end of each branch died forcing the lateral buds to push. With 'Colossal', the lateral buds will produce catkins and female flowers and the trees are currently in production. That is how 60 percent of the 'Colossal' chestnuts handled the winter. Another 20 percent thinned out; that is, only a few buds pushed and there is more wood than green tissue showing. These are just barely holding on and may or may not make it through the next winter. However, some 'Colossal' collapsed completely. They died to the ground and only sucker sprouts from the rootstock are growing. The number of 'Colossal' trees that did this are different in the various orchards. In some, it was five to 10 percent, but in one extreme orchard case above the 45th parallel, probably 80 percent of the 'Colossal' trees thinned out or died. To make matters more confusing, a nearby orchard only suffered a few deaths in their 'Colossal' population.

What we learned

We know that winter did not treat 'Colossal' equally across the state. Some orchards had more deaths than others with their 'Colossal' trees. It is heartbreaking to see a 10- to 17-year-old 'Colossal' collapse like that. The way some growers explained it to me was that the 'Colossal' that died in their orchards had wet feet. In fact, I stood on a relatively high point in one orchard and I could see the path the water took as it drained across the orchard from east to west. I had been to that orchard many times before, but I had never noticed that natural drain, but the grower knew it was there. The 'Colossal' that collapsed in that orchard were situated on that natural drain. In some years, like 2012 when it was so dry, wet soil may have been good for the trees, but in the cold, the winter temperatures killed these trees. In one orchard up north above the 45th parallel, 80 percent of the 'Colossal' trees were damaged or dead. The farm manager admitted the orchard was so flat that the water really did not drain well from the orchard floor at all. Therefore, it seemed that if a 'Colossal' tree had wet roots or damaged bark from equipment abrasions, sunscald or chestnut blight, they were at a much higher risk for death.

But the overall most confusing aspect was when the 'Colossal' trees looked completely healthy and they still collapsed. While these were the minority trees in most orchards,

Figure 4. Two of the six 'Colossal' chestnut trees in one section of an orchard and only one tree died (in foreground). The trees were the same age, from the same nursery, had produced nuts the previous year (burs underneath trees), yet the fate of the trees after the 2013-14 winter were completely different. Could it be because of the rootstock to which the scion wood was attached?

Severe winters can be learning experiences (Continued)

Figure 5. Healthy colossal rootstock without 'Colossal' scion wood attached, looking thrifty in spring after the winter of 2013-14.

maybe I should not spend so much time thinking about them; but I still do find myself dwelling on the topic: why would a completely healthy 'Colossal' tree collapse when those around it survived? I think about a place in the orchard where Bill Nash took me where five 'Colossal' trees are quite healthy but the sixth'Colossal' in the middle of them had collapsed and died (Figure 4). All trees had been treated equally by nature, all within a single microclimate, and all adjacent to one other. As I drove home from his farm I drove down my long driveway by some old 'Colossal' rootstock trees that I had planted in 1997. I had planted them as 'Colossal', but they quickly lost their scion tops. I left them as just rootstock landscape trees along the driveway. I had always marveled at how different the rootstock looked which Fowler Nursery had used for grafting the 'Colossal' scion. One of the rootstocks grew tall and narrow and it was like a forest tree, the other was bushy and had never grown too tall, but both rootstocks had survived over the years since 1997 (Figures 5 and 6). Who knows what their genetic background was? If you had to guess what Fowler Nursery used for rootstock, you would probably guess nuts from 'Colossal'. You would be correct, but who pollinized that 'Colossal' to give us the nut they germinated for rootstock? You might predict that my rootstock was either 'Colossal' pollinized with 'Nevada', or 'Colossal' pollinized by 'Silver Leaf', or 'Colossal' pollinized by 'Fowler'. I am not sure what the pollen source was. I do know that these were the common sources of pollen that Fowler Nursery was using in the 1990's.

As I drove by those two rootstocks on my way home that day it was obvious to me that these rootstocks were completely different from each other. In fact, the small bushy one was dying. It had made an attempt to produce some leaves, but they were small and dying. Only a few buds had even made the attempt, but now they were wilting and collapsing. The other was still straight and tall with many healthy branches. Then it dawned on me. THIS WAS THE VERY ROOTSTOCK ON WHICH MOST OF THE 'COLOSSAL WAS GROWING! Some which could thrive in the winter temperatures and others that could not. The rootstock was extremely variable in its traits and growth including its winter sensitivity. If the rootstock to which the 'Colossal' scion was attached was variable to winter, that might be part of the answer as to why most 'Colossal' withstood the winter cold, but some could not. If the rootstock is damaged, it would look as if the 'Colossal' tree portion died when it was actually the rootstock failing with its winter-sensitive 'Nevada' genes. It may not appear that the rootstock died because sometimes the sprouts below the ground pushed upward creating a bush around the base. But certainly the cells around the graft union may have died. I am betting that those perfect-looking 'Colossal' trees that died had rootstock with the winter-sensitive 'Nevada' or 'Silver Leaf' genes in them. In other words, some 'Colossal' was budded to rootstock that looked like tall, straight rootstock tree and some was budded to the rootstock that just died.

We are years from proving something like this, but it gives me hope that most of the trees that survived this winter are on winter-hardy rootstock and that a winter like this last one will not come around again for at least a decade.

The table below was generated and provided for comparison purposes

Figure 6. Dying colossal rootstock in spring 2014 without 'Colossal' scion wood was severely affected by the winter of 2013-14. The colossal rootstock eventually died in summer 2014. The rootstock in Figure 3 is 40 feet away from this tree. The fate of a 'Colossal' scion attached to the tree in Figure 3 may be different than the fate of a 'Colossal' scion attached to this tree.

Severe winters can be learning experiences (Continued)

Cultivar	Type	Year planted	Nursery	Healthy trees by row	Damaged or dead
'Colossal'	ExJ	2009	Fowler	36	7
'Colossal'		2005	Fowler	13	4
'Colossal' (transplanted after initial planting)		2009	Fowler	14	26
'Colossal'		2006	Fowler	12	8
'Colossal'				18	22
'Precoce Migoule'	ExJ	2013 spring	Forrest Keeling	12	2
'Labor Day' from Michigan	J		Nash	16	3
'Benton Harbor'	Ch	2009	Nash	42	7
'Benton Harbor'		2012	Forrest Keeling	11	2
'Qing', from Kentucky	Ch	2009	Nash	17	5
Dunstan Hybrid (seedling, not grafted)	Ch x Am		Chestnut Hill Nursery, FL	16	1
'Peach' Ohio cultivar	Ch	2013 spring	Forrest Keeling	25	0
'Eaton River' from Tennesee	Complex hybrid	2009	Nowlin River	11	0
'Everfresh' from MI	Ch		Nash	7	0
'Sleeping Giant' from CT	Ch		Nash	19	1
'Au-Super' from Alabama	Ch		Nash	0	3

ExJ = European/Japanese hybrid; Ch = Chinese chestnut; Am = American chestnut; hybrid = complex parentage; J = Japanese
Damaged or dead = trees were dead or severely set back and struggling to push buds.
Data was taken in mid-June.

only. To generate data for this table we went to an orchard that was established where extremely low temperatures are normally found and recorded. In 2014, this orchard had temperatures below –25 F for extended hours more than once. In addition, trees had been exposed to over 30 inches of rain in four months in the summer prior to winter. We took data in this orchard to compare and show differences between the cultivars. These results would not necessarily be repeated in other orchards in other parts of the state, but you can see that Chinese chestnut survived better than 'Colossal' when extremely low temperature was a selection factor. Also, it is important to note in the table that 'Colossal' trees transplanted a couple of years earlier had poor winter survival compared to trees where the roots were not damaged by transplanting. If these data had been taken in Clarksville, for example, we would not have lost a single 'Colossal' tree; and in East Lansing plots on campus, the only 'Colossal' to die had a severe case of chestnut blight. We value these data, but this is not the end of the story.

Summary

It is difficult to summarize the data for one state. We now know that we need to generate by the 10th year an orchard that is producing about 3,500 pounds or more of chestnuts a year if an eight percent return per year is to be achieved. This knowledge was gleaned from the Cost of Production software tool that MSU Extension has provided chestnut growers (www.chestnuts.msue.edu). The only cultivar that can do that is 'Colossal'. It has been shown to do that. Chinese has not been shown to do that, but the cultivar 'Benton Harbor' can get close. Yet we observed severe damage in the orchard presented in the table. That, as we explained, was an extreme case, and I can state that most if not all cultivars in the orchards in the western part of the state survived including 'Colossal'. The only cultivars that did not survive are 'Nevada' and 'Okei', but we already knew they were winter-sensitive. Pollen for 'Colossal' must come from 'Labor Day' and 'Precoce Migoule' until the next generation producers/pollinizers arrive at the nursery. These new cultivars will both pollinize and produce nuts.

We now must hope that the nut tree flowers and pollen have synchronized, that the cool, wet summer (again) will not waste the pollen that shed in July, and that nuts have set and trees will produce large quantities. It seems like this has happened at Clarksville and other locations.

Acknowledgements

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New pesticide quick reference available for Michigan chestnut growers through MSU Extension

By Erin Lizotte, MSU Extension Statewide IPM Educator

In an effort to assist chestnut growers in making pesticide decisions, a new quick reference has been created and is currently available via chestnuts.msu.edu. For your convenience we have included the registered pesticide lists below. The information presented is intended as a guide for Michigan chestnut growers in selecting pesticides for use on edible chestnuts grown in Michigan and is for educational purposes only. The efficacies of products listed have not been evaluated on chestnuts in Michigan. Reference to commercial products or trade names does not imply endorsement by Michigan State University Extension or bias against those not mentioned. Information presented here does not supersede the label directions.

Fungicides labeled for use on edible chestnuts in Michigan, 2014

Activity	Active ingredient (FRAC fungicide group)	Products Labeled
Single site	Fluopyram (7)	Luna Privilege
	Propiconazole (3)	Amtide Propiconazole 41.8% EC, Bumper 41.8 EC, Fitness, Orbit, Propi-Star EC, Propicure 3.6F, Propimax EC, Tilt, Topaz
	Trifloxystrobin (11)	Gem 500 SC
	Tebuconazole (3)	Tebuzol 45 DF, Toledo 45 WP, Amtide Tebuconazole 45WDG
	Azoxystrobin (11)	Abound
Premixes	Sulfur (M2); Tebuconazole (3)	Unicorn
	Azoxystrobin (11) + Difenoconazole (3)	Quadris Top
	Azoxystrobin (11) + Propiconazole (3)	QUILT XCEL
	Boscalid (7) + Pyraclostrobin (11)	Pristine
	Fluopyram (7) + Tebuconazole (3)	Luna Experience
	Fluopyram (7) + Trifloxystrobin (11)	Luna Sensation
Potassium based defenese inducers	Phosphorous acid, mono- and dibasic sodium, potassium, and ammonium salts (33)	Phostrol
	Potassium phosphite (NC[1])	Fosphite, Fungi-Phite, Rampart
Broad spectrum	1,3-dichloropropene (NA[2])	Telone EC
Biopesticides	Neem oil (NC[1])	Trilogy*
	Trichoderma asperellum (ICC 012); Trichoderma gamsii (ICC 080) (NA[2])	Tenet WP*
	Bacillus subtilis strain QST 713 (44)	Serenade ASO*, Serenade Max*
	Clove Oil; Rosemary Oil; Thyme Oil (NC[2])	Sporatec*
	Extract of Reynoutria sachalinensis (P5)	Regalia*

1. Not classified as belonging to a particular mode of action.

2. Not listed or classified by the Fungicide Resistance Action Committee.

*OMRI approved for organic production.

Insecticides labeled for use on edible chestnuts in Michigan, 2014

Chemical Class (IRAC insecticide group)	Active Ingredient	Products Labeled	Target Pests
Multisite, Organophosphates(1B)	Malathion	Cheminova Malathion 57%, Malathion 57 EC, Malathion 8 Aquamal	Mites
	Phosmet	Imidan 70W	Leafhoppers, Lepidopteran pests, Flies, Weevils
Multisite inhibitor (8B)	1,3-dichloropropene + Chloropicrin**	Telone C-17, Telone C-35, Telone II	Nematodes
Avermectins(6)	Abamectin**	Epi-mek 0.15 EC, Reaper 0.15 EC, Reaper Advance, Abacus, Abba 0.15EC, Abba Ultra, Abamectin, Agri-Mek SC, Agri-Mek S.15	Mites
	Emamectin benzoate**	Proclaim	Lepidopteran pests
Carbamates(1A)	Carbaryl	Carbaryl 4L, Sevin 4F, Sevin 80S, Sevin XLR Plus, Sevin SL	Leafhoppers, Lepidopteran pests, Weevils, Aphids, Scale
Diacylhydrazines(18)	Methoxyfenozide	Intrepid 2F	Lepidopteran pests
	Tebufenozide	Confirm 2F	Lepidopteran pests
Diamides(28)	Chlorantraniliprole	Altacor	Lepidopteran pests
	Flubendiamide	Belt SC	Lepidopteran pests
Diamides(28) + Pyrethroids(3)	Chlorantraniliprole + Lambdacyhalothrin**	Voliam Xpress	Lepidopteran pests, Plant bugs, Stink bugs, Aphids, Weevils
METI(21A)	Fenpyroximate	Portal	Mites, Leafhoppers
	Pyridaben	Nexter	Mites, Aphids, Leafhoppers
Pyrethroids(3)	Bifenthrin**	Bifenture 10DF, Bifenture EC, Brigade WSB, Fanfare 2 EC, Sniper	Lepidopteran pests, Plant bugs, Stink bugs, Weevils, Mites, Aphids
	Beta-cyfluthrin**	Baythroid XL	Lepidopteran pests, Leafhoppers, Weevils, Stink bugs
	Cyfluthrin**	Renounce 20 WP, Tombstone, Tombstone Helios	Lepidopteran pests, Weevils, Sink bugs
	Gamma-cyhalothrin**	Declare, Proaxis	Lepidopteran pests, Aphids, Weevils, Stink bugs
	Lambdacyhalothrin**	Grizzly Z, Lambda T, Lambda-CY EC, Lambdastar, Lambdastar 1CS, Lamcap, Nufarm Lambda-Cyhalothrin 1EC, Paradigm, Province, Silencer, Warrior II with Zeon, Warrior with Zeon, Willowood Lambda-CY 1EC	Lepidopteran pests, Flies, Aphids, Plant bugs, Stink bugs
	Pyrethrins	Pyganic EC 1.4 II*, Pyganic EC 5.0 II*	Lepidopteran pests, Leafhopper, Weevils, Maggots, Aphids, Stink bugs
	Zeta-cypermethrin**	Mustang, Mustang Max, Mustang Maxx, Respect, Respect EC	Lepidopteran pests, Leafhoppers, Aphids, Weevils, Sink bugs, Plant bugs, Flies
	Deltamethrin**	Delta Gold	Aphids, Lepidopteran pests, Leafhoppers, Weevils, Stink bugs, Plant bugs, Scale, Maggots
	Fenpropathrin**	Danitol 2.4EC Spray	Lepidopteran pests, Mites, Plant bugs, Stink bugs
Pyrethroid(3) + Pyrethroid(3)	Bifenthrin** + Zeta-cypermethrin**	Hero EW, Steed	Lepidopteran pests, Weevils, Aphids, Scale, Mites, Stink bugs, Plant bugs
Pyrethroids(3) + Neonicitinoids(4A)	Cyfluthrin** + Imidacloprid	Leverage 2.7	Lepidopteran pests, Leafhoppers, Weevils, Plant bugs, Stink bugs, Flies, Aphids
	Lambdacyhalothrin**; Thiamethoxam	Endigo ZC	Lepidopteran pests, Aphids, Flies, Wevils, Stink bugs, Plant bugs
	Beta-cyfluthrin** + Imidacloprid	Leverage 360	Lepidopteran pests, Plant bugs, Stink bugs, Weevils, Flies, Aphids
	Bifenthrin** + Imidacloprid	Brigadier, Swagger	Lepidopteran pests, Leafhoppers, Aphids, Plant bugs, Stink bugs, Mites, Scale

New pesticide quick reference available for Michigan chestnut growers through MSU Extension (Continued)

Insecticides labeled for use on edible chestnuts in Michigan, 2014			
Chemical Class (IRAC insecticide group)	**Active Ingredient**	**Products Labeled**	**Target Pests**
Neonicitinoids(4A)	Imidacloprid	Admire Pro, Advise 2FL, Amtide Imidacloprid 2F, Agri Star MACHO 2.0 FL, Couraze 2F, Couraze 4F, Mana Alias 4F, Montana 2F, Montana 4F, Nuprid 1.6F, Nuprid 2F, Nuprid 2SC, Nuprid 4.6F Pro, Nuprid 4F Max, Pasada 1.6F, Provado 1.6F, Sherpa, Trimax Pro, Widow, Wrangler	Aphids, Leafhoppers, Scale
	Thiamethoxam	Flagship 25WG[3]	Leafhopper, Weevils, Aphids, Plant bugs
	Acetamiprid	Assail 30SG, Assail 70WP	Aphids, Lepidopteran pests, Leafhoppers, Weevils
	Clothianidin[1]	Belay	Aphids, Leafhoppers, Weevils, Scale, Stink bugs
Spinosyns(5)	Spinosad	Entrust*, Entrust SC*, GF-120 NF*, SpinTor 2SC	Lepidopteran pests
	Spinetoram	Delegate WG	Lepidopteran pests
Tetramic acids(23)	Spirodiclofen	Envidor 2SC	Mites, Scale
	Spirotetramat	Movento	Aphids, Scale
Biopesticides	*Bacillus thuringiensis* (11A)	Dipel DF*	Lepidopteran pests
	Myrothecium verrucaria[2]	Ditera DF*	Nematodes
	Peppermint Oil; Rosemary Oil[2]	Ecotec*	Aphids, Mites
	Potassium salts of fatty acids[2]	M-Pede*	Leafhopper, Mites, Aphids
	Chromobacterium subtsugae[2]	Grandevo*	Lepidopteran pests, Aphids, Mites
	Extract of *Chenopodium ambrosioide*[2]	Requiem 25EC, Requiem EC	Aphids, Mites
	Kaolin[2]	Surround WP	Lepidopteran pests, Weevils, Aphids, Leafhoppers, Stink bugs
Insect Growth Regulators or Inhibitors	Etoxazole	Zeal Miticide 1	Mites
	Hexythiazox(10A)	Savey 50 DF	Mites
	Pyriproxyfen(7C)	Esteem 0.86EC, Esteem 35WP, Pitch 0.86EC	Lepidopteran pests, Ahpids, Scale
	Diflubenzuron(15)	Dimilin 2L	Lepidopteran pests, weevils
	Azadirachtin (IGR)	Aza-Direct*, Azatin XL, Ecozin Plus 1.2% ME*, Neemazad 1% EC*, Neemix 4.5*	Aphids, Beetles, Stink bugs, Lepidopteran pests (including leafhopper), Mites, Scale
Not Classified or Unknown	Acequinocyl	Kanemite 15 SC	Mites
	Bifenazate	Acramite 50WS	Mites

* OMRI approved for organic production.

** Products containing these active ingredients are classified as a restricted use pesticides and require the applicator to retain a pesticide applicator license.

1. Supplemental label subject to annual renewal.

2. Not classified by the Insecticide Resistance Action Committee (IRAC).

3. For use on nonbearing trees only.

New pesticide quick reference available for Michigan chestnut growers through MSU Extension (Continued)

Chestnuts belong to Crop Group 14 (Tree Nuts), as defined by the Environmental Protection Agency (EPA). Crop groups have helped streamline the pesticide registration and labeling process and are based on similar biological traits, edible parts, dietary consumption, geographical distribution, economic importance, and growing practices. For example, the Tree Nut crop group contains other edible nuts including almond and pecan. Tolerance information for a given pesticide is based on research in a representative crop and may be extended to similar crops within the same crop group. This has allowed for a substantial increase in the accessibility of pesticides to specialty crop producers.

There are two types of pesticide labels that can apply to chestnut trees, Agriculture/Crop Protection labels for trees from which nuts will be harvested for consumption, and Turf & Ornamental/Non-Crop labels which apply to ornamental trees from which nuts will not be harvested for consumption. Specific products may be labeled for chestnut trees that fall into one or both of these categories, but for the legal use of a pesticide on chestnuts for nut production it must have an Agriculture/Crop Protection label. The practices surrounding proper use may vary greatly between these two label types and growers should read and closely follow the Agriculture/Crop Protection label carefully. Growers are encouraged to reference the Crop Data Management Systems website (www.cdms.net/) to retrieve the latest labels and determine if the product is meant for food or nonfood crop application. For more information on how to read a pesticide label refer to the Penn State Article, Reading a Pesticide Label at http://pubs.cas.psu.edu/freepubs/pdfs/UO215.pdf. Penn State also offers this Factsheet in Spanish, along with additional resources regarding pesticide safety on their website http://extension.psu.edu/pesticide-education/applicators/fact-sheets.

To protect yourself, others, and the environment, always read the label before applying any pesticide. Although efforts have been made to check the accuracy of information presented it is the responsibility of the person using this information to verify that it is correct by reading the corresponding pesticide label in its entirety before using the product.

Midwest Nut Producers Council Journal

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UPCOMING EVENTS

Sept. 7 -	**Harvest Meeting of the Midwest Nut Producers Council** Noon to 2 p.m. at the MSU Clarksville Research Center, 9302 Portland Rd., Clarksville, Mich., and 3 to 5 p.m. MSU South Campus
Oct. 12-25	**National Chestnut Week**
Nov. 8	**AutumnFest: MSU College of Agriculture and Natural Resources Tailgate** Chestnut Road, MSU Pavilion for Agriculture and Livestock Education, East Lansing, Mich.
Nov. 21	**Silver Bells in the City** Chestnut Road, Downtown Lansing, Mich., 5 to 9 p.m.
Dec. 9-11	**Great Lakes Fruit, Vegetable and Farm Market EXPO and Michigan Greenhouse Growers EXPO** DeVos Place Convention Center, Grand Rapids, Mich.
June 2015	**Rooting Cuttings of Chestnut Cultivars Workshop**