



Extension
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CHLORPYRIFOS UPDATE

by Christelle Guédot

UW-Madison, Department of Entomology

Chlorpyrifos, the active ingredient in Lorsban (Dow/DuPont) and other products, is an organophosphate (IRAC group 1B) that has been under scrutiny in recent years by EPA. Lorsban is registered on many crops, including cranberry, grape, strawberry, and tree fruits. In cranberry, Lorsban is typically used early in the season to manage fire worms, fruit worms, and spanworms, and two applications are allowed per season.

In 2017 along with other states, we provided feedback to EPA for continuing the registration of chlorpyrifos on fruit crops in Wisconsin and EPA maintained all tolerances for this active ingredient at the time.

This month, California and New York both announced that they were canceling the registration of chlorpyrifos. In New York, legislators approved Senate and Assembly bills to ban chlorpyrifos in NY beginning in 2021 (Peter Jentsch, Cornell University, Scaffolds Vol 28, No. 8 May 13, 2019). While this legislation still requires the approval of the NY governor to put the new law into effect, it would ban all use of chlorpyrifos by December 2021. Hawaii was the first state to ban chlorpyrifos in 2018 with an effective date of 2022. Oregon, Connecticut and New Jersey all have bills on the table to ban chlorpyrifos.

Chlorpyrifos is fully registered in Wisconsin and we have not heard anything from our legislators on plans to ban chlorpyrifos in Wisconsin anytime soon. Stay tuned for more information on the registration status of chlorpyrifos.

Happy growing season!



<https://www.ebay.ca>

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REDUCING HERBICIDE RATES: DOES IT SAVE MONEY OR CAUSE MORE PROBLEMS THAN IT IS WORTH?

by Jed Colquhoun
Professor and Extension Specialist
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Growers often review their records and past experiences to think about ways to reduce inputs such as labor, fertilizer and pesticides. With that we often hear the limbo question: “how low can you go?”. In terms of herbicide use the risks and potential benefits of reducing application rates should be considered.

Risks:

- The most obvious and basic risk is poor weed control that plays into all of the other risks listed below.
- Crop yield and quality can be reduced by competition from weeds that survive application.
- Uncontrolled weeds mature to reproduction and form seeds (and/or vegetative tissue for perennials) that make future problems even worse, which might then require more inputs than originally anticipated. Moreover, weeds that survive sub lethal injury to produce viable seeds start the selection pressure for herbicide-resistant plants. In short, dead weeds don’t cause problems...
- Additional herbicide applications or control measures may be needed to manage escapes.
- While herbicides can be applied at lower rates than those listed on the label if the label doesn’t prohibit you from doing so, you alone are liable for any problems such as those outlined above from a reduced rate use.

Potential benefits:

- Many growers look at reducing rates as a way to reduce costs, particularly for more expensive herbicides.
- For some herbicides, reducing the rate can also reduce the risk of crop injury and subsequent yield and quality loss. This risk reduction is particularly important when environmental conditions favor crop injury. For example, some soil residual herbicides are known to have more crop injury risk when applications are followed by cool, wet weather.
- In some cases reducing the herbicide rate can also reduce associated environmental risks, such as leaching. However, keep in mind that such risks were considered when the full labeled rates were established, so this benefit may not be as clear-cut as it first seems, particularly if more applications are needed to control escaped weeds.

Several questions should be answered when considering herbicide rate reductions:

- What is the risk of selecting for resistant weeds for the herbicide site of action? Some herbicide sites of action are quite prone to selecting resistant weeds, while others have been used for decades with minimal or no herbicide-resistant weeds. Take a look at www.weedscience.org to see a list of herbicide-resistant weed cases for the herbicide you’re considering.
- Is there a weed threshold established for the particular target species, and if so what does that look like relative to your weed population (see example in Figure 1)? There are some weeds that are more aesthetically displeasing than damaging to the crop. Keep in mind, though, that weeds that reach reproductive maturity can make future problems worse – like fire, they’re easier to “extinguish” when small and limited in area!
- What is your previous experience both with crop tolerance and weed control with the herbicide in question? Good recordkeeping can make the rate decision quite easy – what’s worked for you in the past and were there any negative consequences to the rates you’ve used previously?
- What’s the crop status and has there been any environmental stress that could affect crop response to an herbicide application? Labels often include language like “crop injury risk is greater when air temperatures are above xx degrees” or “avoid applications in cool, wet weather”. These are based on research and experience – pay attention to them!

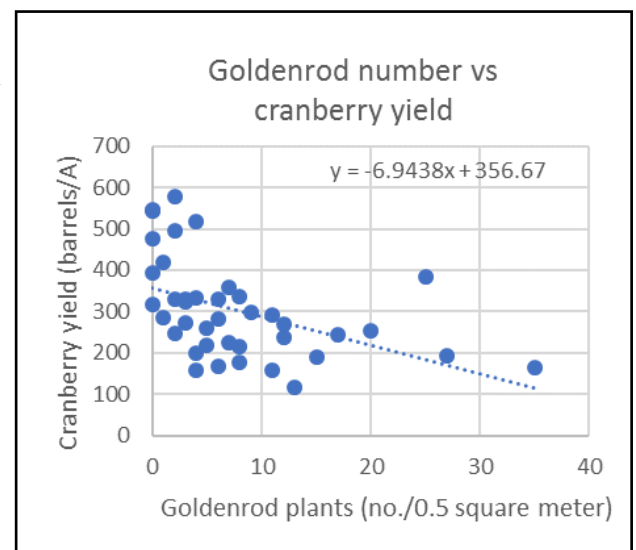


Figure 1. An example of weed density impact on cranberry yield.

SPRING PESTS: WHITE GRUB & SPARG

by Jayne Sojka and Pam Verhulst
Lady Bug IPM, LLC

We are limited on what we can do with white grub (June beetle) infestations in cranberry. We have been experimenting with flooding in the spring. We discovered, by accident, that another grower drove many June beetles out of their bed while flooding for our typical spring pests. The beetles were then removed with the trash.

We know that white grubs have a three year life cycle so in our experimenting we are encouraging growers with white grub to repeat flooding, in the spring, for 3 years.

Growers are also incorporating mating disruption and mass trapping. By trapping, we can determine pressure and know when they are emerging from the soil. When flight begins, growers flood and are able to control the adults before they have the opportunity to mate and lay more eggs.

White Grub



June Beetles



Sparg webs—5/28/2019 in Cranmoor.



Sparg in the field.



...THE SURVEY SAYS! 2017 CENSUS OF AGRICULTURE

by Matt Lippert
Agriculture Agent, Wood County

Most likely you recall all the questions, many not pertaining to your marsh that you were required by law to reply to in early 2018. It was the *2017 Census of Agriculture*. The Census of Agriculture is an impressive historical record. The first Census of Agriculture was taken in 1840. The time between each census has varied but currently is every 5 years. Just recently most of the 2017 census numbers have been made available. What tidbits of information can we glean from this vast volume of data?

The census firmly establishes that the cranberry is the state's leading fruit, with **21,514 acres** under cultivation with 20,804 of those acres bearing fruit. By comparison, Tart cherries are on 1,962 acres all but 17 in Door County. Apples are on 4,673 acres—down nearly 900 from the last census. Cherries are down over 500 acres as well. Door County leads in apple and cherry acres with Crawford County second in apples.

Wisconsin cranberry acres increased significantly between the 2007 census and 2012 up nearly 2,000 acres from 18,696 to 20,641. Wisconsin acres are up nearly 1,000 more acres to 21,514 with the 2017 census.

What fruit crops have increased in acres? Grapes are up 100 acres from the 2012 census, to 917 acres. There are some gains in nuts as well. Hazelnuts increased from 60 acres to 157 from 2012 to 2017.

All other fruit and nuts really are just small potatoes compared to cranberry. Speaking of potatoes, Wisconsin had 70,110 acres of those. Green pea acreage was comparable to cranberry acres.

Wisconsin Farms by Concentration of Market Value of Agricultural Products Sold: 2017

Berries:	
25% of sales	5 farms \$27.3 million
50% of sales	26 farms \$62.6 million
75% of sales	121 farms \$118.6 million

Acreage of berry crops in Wisconsin US Census of Agriculture 2017

Cranberry, total	21,514
Cranberry, bearing	20,804
Strawberry	862
Blueberry, all	367
Blueberry, tame	358
Blueberry, wild	9
Raspberry, all	209
Raspberry, red	165
Raspberry, black	28
Raspberry, other	17
Aronia	77
Blackberry	68
Currant	32
Elderberry	19
Boysenberry	4
Berries, other	22

In many Wisconsin Counties cranberry production takes up the bulk of irrigated acres. For example Wood County has 6,800 acres under irrigation on 122 farms. Wood County also reports 6,199 acres of cranberries on 86 farms. Did some cranberry growers not report irrigation?

We have been concerned about the plight of our pollinators. Certainly there is year to year variation but the comparisons of the two most recent censuses clearly show some of the challenges for honeybees. **Hives dropped from 49,661 in 2012 to 28,673 in 2017** in Wisconsin.

There are other sources of data regarding cranberry acreage and production but it is a good fact check to see if the census got things right. The top five Wisconsin Counties for cranberry acreage are:

- 1. Wood with 6,199
- 2. Monroe with 3,601
- 3. Jackson with 3,528
- 4. Juneau with 2,835
- 5. Portage with 906

In northern Wisconsin, Oneida County checks in with 840 acres.

Doing the math with Wisconsin’s 234 reported growers, the average marsh acreage is 92 acres. Massachusetts reported more growers at 363 an average marsh size of 34 acres and a total of 13,555 acres. Massachusetts reported more acres of non-bearing age than we did in Wisconsin. 83% of Mass cranberry acreage comes from just one county - Plymouth County. With 11,354 acres of cranberries it is far ahead with more acres than our top two counties combined.

New Jersey only reported 3,415 acres of cranberry but had 9,652 acres of cranberry’s vaccinium cousin blueberry.

Some larger trends beyond the cranberry industry: Land in farms continues to decline. Wisconsin has **lost nearly 2 million acres** since 1997. During that time the value per acre has increased from \$1,264 to \$4,904. Value per acre increased from 2012 despite a decline in in market value of agricultural products in our state. This number: \$11.4 billion in Wisconsin in 2017 is down from \$11.7 billion in 2012. However these numbers are over twice the value that was reported in the 2002 and 1997 censuses. Cranberry growers have their own personal experience with declining value per unit of output.

The Census of Agriculture is prepared by the USDA –National Agricultural Statistics Service (NASS). NASS does surveys in addition to the Census of Agriculture. To keep things consistent with the census, NASS numbers for Wisconsin cranberry yield and \$/barrel for 2012 and 2017 are selected here. Wisconsin’s crop increased from 4.8 million barrels in 2012 to 5.4 million barrels in 2017; however the average price per barrel dropped from \$47.80 to \$29.20. Even though we brought in a larger crop, the total value of the crop dropped \$74 million, from \$230.8 million to \$156.8 million.

Yield per acre, one measure of efficiency has increased over time. The 2012 Wisconsin barrels/acre stood at 245.2, in 2017, not an especially strong yield year, it increased to 259.5.

The census of agriculture documents a problem for cranberry growers and many others in agriculture. Increased operational cost, reduced price for the commodity, increased yield both causing the problem and helping producers cope. Declining value of sales only covers part of the concern for profitability as costs continue to increase.

For more information on the 2017 Census of Agriculture and other agriculture statistics, go to:

www.nass.usda.gov/AgCensus/

Average Age of Producer Wisconsin 2017 Census of Agriculture	
All producers (managerial or ownership interest)	
2017	56.0
2012	54.5

Net Cash Farm Income of Operations: Wisconsin Census of Agriculture	
2017	35,195
2012	41,897

5 Year acreage trend, selected Wisconsin crops, US Census of Agriculture		
Total orchard	2017	7,852
(non-citrus)	2012	9,252
Grapes	2017	917
	2012	817
Tart Cherries	2017	1,982
	2012	2,577
Apples	2017	4,673
Pears	2017	102
	2012	105
	2012	5,520
Hazelnuts	2017	157
	2012	60
Walnuts	2017	127
Other nuts	2017	195

STANDARDIZING TERMINOLOGY:

GETTING ON THE SAME PAGE TO MAKE DECISIONS

by Amaya Atucha
Assistant Professor and Extension Specialist, UW-Madison
& Lindsay Wells-Hansen
Agricultural Scientist, Ocean Spray

During the spring mini-clinics we talked about defining several concepts that scouts and researchers use to provide management recommendations to growers, but there seems to be substantial differences in the way we evaluate them. Here's a summary of our recommendation.

IN and OUT of Bloom: These two terms have been used to define fungicide, fertilizer, and insecticide applications, as well as to determine when to bring in pollinators.

How do we calculate IN and OUT of bloom?

- When to start? Start when you see first open flower in the bed. Start calculating OUT of bloom when you see the first pinheads.
- Scout twice a week (things will move faster with warm weather and in newer cultivars and new plantings).
- Select beds that are representative of a cultivar or block (you don't have to do it in ALL beds).
- Collect 30 uprights by dividing the bed into thirds and collecting 10 uprights from each third.
- Count the total number of pods (closed flowers), open flowers, and fruits (including pinheads) for all 30 uprights.
- Rub the petals of flowers to check if they have been pollinated.

$$\% \text{ IN Bloom} = \left[\frac{\# \text{ open flowers}}{\# \text{ open flowers} + \# \text{ pods}} \text{ On 30 uprights} \right] \times 100$$

$$\% \text{ OUT Bloom} = \left[\frac{\# \text{ fruit}}{\# \text{ open flowers} + \text{ pods} + \text{ fruit}} \text{ On 30 uprights} \right] \times 100$$

When should you use % IN or OUT of bloom?

The % IN bloom is used for timing of fungicide applications (e.g., apply at 25 to 30% IN bloom), or when bringing in pollinators at ~ 15% IN bloom. Out of bloom is used for fertilizer applications, with a recommendation to start first nitrogen fertilizer application around 30 to 50% OUT of bloom. Fruit worm control is recommended at 7 to 10 days after 50% OUT of bloom.

Growing Degree Days (GDD) versus Degree Days (DD): GDD and DD are mathematical ways to calculate the accumulation of heating units over time, and they have been used by entomologists, plant pathologists, horticulturists, and agronomists to model the development (phenology) of arthropod pests, plant diseases, plants, crops, and weeds.

GDD have been used to describe the heat accumulation for plants. However, **there are no phenology models for cranberry vines based on GDD.** What this means is that we **cannot** predict cranberry vine phenological stages (e.g., bud break, rough neck, bloom) based on GDD. However, calculating GDD can still be helpful for growers to be able to compare growing seasons based on heat accumulation. In addition, if growers couple the recording of GDD with timing of phenological stages, over time some correlations could be established for an individual marsh based on GDD and plant development.

How to calculate GDD?

- Ideally you would use temperature records from your beds, if not available local weather stations are ok.
- Start calculating GDD January 1st or after the ice is off, just be CONSISTENT from one year to the next.
- YOU MUST record phenological stages to be able to use the GDDs.
- We don't have models to predict phenological stages with GDD as we do for insects.
- You can use GDD and the phenological stages that you record at your own place to compare year to year.

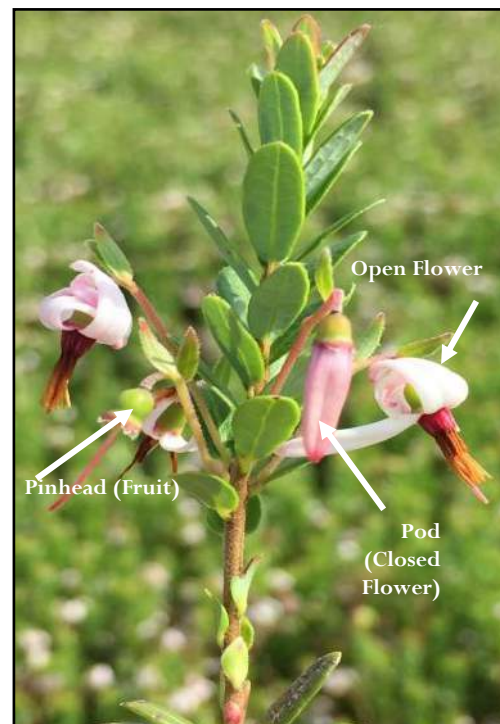
$$\text{GDD} = \left[\frac{(\text{Maximum} + \text{Minimum daily temp})}{2} \right] - \text{Base temp (41 deg F)}$$

Degree Days (DD) are used to describe heat accumulation for insects. The Steffan lab at UW-Madison has developed models to predict insect development and assist growers with insecticide applications for Sparganothis and cranberry fruit worm.

Here's a link to their website:

<http://labs.russell.wisc.edu/steffan/cranberry-growing-degree-days/>.

In summary, GDD and DD are both heat units used to track plant and insect development during the growing season. However, in the case of GDD for cranberry vines we don't have models that allow us to predict plant development based on GDD accumulation. In the case of insects, there are several models developed by Dr. Shawn Steffan's research lab that can predict Sparganothis and cranberry fruitworm development based on the accumulation of DD during the growing season.



WISCONSIN CRANBERRY RESEARCH STATION UPDATE

by Wade Brockman
Wisconsin Cranberry Research Station

I hope everyone had a great Memorial Day weekend!

This last week, we put in the underground flood and drain system for the research bed and because of the great weather we were able to get the bed liner put in over the Memorial Day weekend. With all the rain we've been having, it is slowing the renovation progress which still has me waiting to put in drain tile and irrigation.

This last week of May, I am anticipating a bug spray which we will have to time between all the rain chances predicted.

Once again, let's hope for warmer weather and a little less rain.



GROWER UPDATES

GARDNER CRANBERRY

The growing season sure feels to be slow and cold to start, but Mother Nature always finds her way.

The up-north properties received anywhere from a half of an inch to four inches of snow on May 19th. Let's just say, not much growth is happening up there yet! Central WI marshes are starting to advance on the edges but looking forward to the warm forecast this Memorial weekend. The timing for most of our insect control will be after Memorial weekend and when we can find dry time. A lot of the properties have been focusing on weed control and dike repairs in between the rain.

Over the long weekend, our Pittsville properties received a total of two inches of rain.

Let's hope June is a sunny month!

Willow Eastling

RUSSELL REZIN & SON INC.

Hello and happy spring! Hope everyone is staying dry!

I don't know about you, but the few warm, sunny days we had between all of the wind and rain sure felt nice - I think the buds would agree!

Over the past few weeks, we were able to work on our five and a half acres of newly renovated beds. We put in our drain tile and had some help laying new underground irrigation pipe.

Earlier in the spring, we mowed one of our Mullica Queen beds and were able to get all of our planting done by Memorial Day weekend. In between the planting chaos, we applied Casaron and our first application of fertilizer. In the upcoming weeks we are keeping a close eye on the bug hatch and tuning up our mowers.

Bring on the warmer summer weather (especially the warmer nights) and happy budding!

Amber Bristow



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