

Friday, May 20, 2022

OMAFRA Vegetable Team:

Travis Cranmer, Guelph 519-835-3382 travis.cranmer@ontario.ca

Dennis Van Dyk, Guelph 519-766-5337 dennis.vandyk@ontario.ca

Elaine Roddy, Ridgetown 519-401-5890 elaine.roddy@ontario.ca

Amanda Tracey, Ridgetown 519-350-7134 amanda.tracey@ontario.ca

"In This Issue"

- Before You Plant, Think About Herbicide Residues
- VCR Vegetable
 Crop Report May 19th, 2022

Before You Plant, Think About Herbicide Residues Kristen Obeid, M.Sc., Weed Management Specialist – Horticulture, OMAFRA



As you get ready to plant, stop and think about which field you should be planting and what its herbicide history is. If you have a mixed field and horticulture crop operation you need to be extremely careful with your crop rotation. Herbicide residues and carry over can be real issues, maybe not every year but they can come up unexpectedly. For example, in excessively wet or dry years or if soil pH is high or low, different types of herbicide carry-over may be more pronounced. The

amount of herbicide residue in the soil is directly related to herbicidal properties, soil and climatic factors.

If you are unsure, it is always best to test for residues. The easiest and cheapest method is to conduct a soil bioassay. This is a simple way to determine if it is safe to seed or plant into areas previously treated with herbicides or into soil with an unknown history of herbicide use. A bioassay uses susceptible plants to identify if the herbicide is present in concentrations high enough to inhibit germination and/or alter plant growth. Bioassays can be completed by a lab or by anyone, including yourself or your consultant.

There are two types of bioassays, field bioassays and indoor bioassays.

Field bioassay:

- 1. Plant one or more strips of a species sensitive to the suspect herbicide in several locations in the suspect field, as close to planting as possible for more accuracy. Choose an area that is the most suspect of residues as well as an area that can be used as a check.
- 2. Before planting the crop allow the test plants to grow and develop symptoms of injury from any herbicide residues.



Before You Plant, Think About Herbicide Residues...con't

Indoor bioassay: Neal (2021)

- 1. **Collect representative soil samples.** Sample from areas suspected of having herbicide residues as well as areas which are known to be free of herbicides. You will use the herbicide-free soil for comparison. Keep only the upper two inches of soil as most residual herbicides will be bound in this zone. On sandy soils sample to four inches. Take several samples from an area and combine them. You need enough soil to fill several pots in which you will grow the bioassay plants.
- 2. Select the bioassay species. The best bioassay species is the one you intend to grow or select a particular species known to perform well in bioassays such as ryegrass, oats, beans, peas, and tomato. Table 1 provides a list of recommended bioassay species for different herbicide families or modes of action.
- 3. Seed and grow for about three weeks. Seed or transplant the bioassay species in "clean" and "contaminated" soil. Place the pots in a greenhouse or on a sunny windowsill and keep them watered. Examine the overall growth, leaves, and roots. Look for stunting, yellowing (or other discoloration), abnormal leaf or stem growth, and root swelling.

Bioassays can be completed for any type of herbicide if the mode of action of the herbicide is known.

Correcting for Herbicide Residues

If the bioassay indicated a potential herbicide-residue problem, several steps can be taken:

- 1. First select a tolerant crop or variety. This depends on the herbicide of concern. Check the label.
- 2. Till the field. Tillage can help dilute the herbicide.
- 3. Plant the field of concern last. Delaying planting allows more time for the herbicide to dissipate.
- 4. If triazine (Treflan Group 3) or chlorimuron (Classic Group 27) herbicides are suspected, check your soil pH and adjust accordingly.
- 5. If imazethapyr (Pursuit Group 2) is suspected, check for low soil pH (<5.5). Liming would benefit crop growth and minimize carryover of this herbicide.

Conclusion

Soil bioassays are another tool, they are not 100 percent accurate in predicting herbicide-residue problems. However, a bioassay will allow you to make better decisions about crop rotation, herbicide selection, planting date and other cultural practices.

Herbicide Group #	Example Trade Names	Suggested Bioassay Species Neal (2021)	Injury Symptomology Neal (2021)		
2	Pinnacle, Pursuit, Sandea, Ultim, Upbeet	cucumber, spinach, tomato	Stunting and general yellowing of the new growth		
3	Prowl, Treflan	oat, ryegrass	Stunting, swollen and shortened or "clubbed" roots		
4	2,4-D, Dicamba, Lontrel	beans, cucumber, tomato	Malformed, twisted shoot growth (epinasty)		
5	Atrazine, Simazine	cucumber, tomato	Stunting, interveinal yellowing of new leaves (starting with about the third true leaf)		
14	Authority, Chateau, Goal	mustard, ryegrass, tomato	Stunted shoot growth, roots less affected. Foliage necrotic where contacted by herbicide treated soil		
15	Devrinol, Dual, Frontier, Zidua	oat, ryegrass	Stunting, malformed leaves		
27	Armezon, Callisto, Impact, Infinity, Laudis	bean, oat	Bleached new growth and stunting		
29	Alion	mustard, ryegrass	Reduced emergence, stunted root system, chlorotic foliage and growing points		

Table 1. Bioassay species for residual herbicides and the expected injury symptoms

Reference

Neal, J. (2021, August 4). Conducting a Bioassay for Herbicide Residues. NC State Extension Publications. <u>https://content.ces.ncsu.edu/conducting-a-bioassay-for-herbicide-residues</u>

VCR – Vegetable Crop Report – May 19th, 2022

The VCR (vegetable crop report) is a weekly update which includes crop updates, weather and growing degree summaries for various vegetable growing regions across Ontario.



Temperature: After cooler weather the past few weeks, GDD have caught up or greatly surpassed the 10 year average in all counties. Temperatures are expected to rise over the weekend before cooling and returning into the teens or low 20s into next week. All regions except Sudbury are at threshold for onion and seedcorn maggot. Essex, Chatham-Kent and Norfolk counties are at threshold for carrot rustfly. All counties except Wellington, Simcoe, Durham and Peterborough are at threshold for tarnished plant bug. Durham and Kentville are at threshold for carrot weevil and Essex has also reached it's threshold for aster leaf hopper.

Precipitation: Kemptville has now surpassed their 10 year precipitation average. Essex, Chatham-Kent, and Norfolk are catching up to their May 10 year averages. All other counties, and especially Sudbury, are lagging behind. Heavy rain, and in some regions thunderstorms, are forecasted over the weekend and more rain may come mid next week.

Crop Updates

Brassica crops – Transplanting continues. Some counties that experienced frost may see the older, outer-most leaves turn yellow and wilt over the next week. Dig up wilted plants and inspect roots for maggots as seedcorn maggot flies has been active and eggs laid over the past week the past week will be hatching.

Carrots – Some early seeded fields in SW Ontario have emerged. In Central Ontario some fields have been seeded, with the bulk of the seeding to be done in the next week or two. Carrot rust fly is nearing emergence in the Southern regions of the province.

Garlic – Leek moth has been active in most areas across the province and eggs laid over the past week will be hatching into larvae over the next week. Inspect the inner most leaves and look for feeding damage from leek moth larvae. These leek moth larvae will be responsible for the main peak flight generally experienced in the first half of June. Continue to dig up wilted plants and look for seedcord maggot larvae, wireworms or millipedes. Most plants are past the 5th leaf stage, so most nitrogen should be applied by now for the greatest impact. Avoid applying nitrogen to older plants to reduce the amount of rough bulbs at harvest as well as to encourage longer storage life.

Onion – Most transplanted and direct seeded onion fields finished planting over the past week with the majority of direct seeded fields in the flag or first true leaf stage. Onion maggot flies have reached their threshold for the first-generation emergence in most counties and damage from early season activity will likely be observed shortly. Dig up wilted plants and inspect roots for onion maggot larvae.

Potatoes – A cool spring has resulted in slow emergence. Early fields in SW Ontario have emerged. With excellent planting conditions last week a large portion of the main crop was planted. The light rains have paused planting temporarily but field conditions remain quite good.

Tomatoes – Planting is underway. Scouting for early season pests, such as Colorado potato beetle, black cutworm and wireworm, should be started as soon as transplanting is complete. If you were unable to attend the Tomato and Pepper IPM scouting workshop on May 4th, a recorded version can be viewed below: https://youtu.be/p2fi_hla4Q8

VCR – Vegetable Crop Report – May 19th, 2022...con't

Pest Degree Day Forecasting

*NOTE: Data as of May 18, 2022

County	Carrot Rust Fly	Onion Mag- got	Carrot Wee- vil	Aster Leafhopper	Tarnished Plant Bug	Cabbage Maggot	Seedcorn Maggot	European Corn Borer
THRESHOLD	329-395, 1399-1711	210-700, 1025-1515	138-156, 455+	128+	40+	314-398, 847-960, 1446-1604	200-350, 600-750, 1000-1150	See legend below
Essex*	392	337	196	131	68	239	337	105
Chatham-Kent*	339	289	164	107	52	202	289	88
Norfolk**	339	292	169	108	50	207	292	85
Huron***	314	270	159	107	53	191	270	87
Wellington**	279	236	128	78	37	160	236	65
Simcoe County***	280	238	133	81	39	164	238	64
Durham***	313	265	148	94	39	183	265	72
Peterborough	277	234	126	79	32	158	234	62
Kemptville***	318	268	153	102	47	184	268	81
Sudbury***	199	174	108	76	43	128	174	64

*- Bivoltine region for ECB. First Peak Catch: 300-350 DD, Second Peak Catch 1050-1100 DD

**- Overlap region for ECB. First Peak Catch: 300-350 DD Second Peak Catch 650-700 DD, Third Peak Catch 1050-1100 DD

***-Univoltine region for ECB. Peak Catch 650-700 DD

Use these thresholds as a guide, always confirm insect activity with actual field scouting and trap counts.

Select a region below for the latest weather, crop and pest degree day information:

Essex County(https://onvegetables.com/2022/05/19/vcr2022-3/#essex)

Chatham-Kent County(<u>https://onvegetables.com/2022/05/19/vcr2022-3/#chatham-kent</u>)

Norfolk County(https://onvegetables.com/2022/05/19/vcr2022-3/#norfolk)

Huron County(https://onvegetables.com/2022/05/19/vcr2022-3/#Huron)

Wellington County(https://onvegetables.com/2022/05/19/vcr2022-3/#wellington)

Simcoe County(<u>https://onvegetables.com/2022/05/19/vcr2022-3/#simcoe</u>)

Durham County(https://onvegetables.com/2022/05/19/vcr2022-3/#durham)

Peterborough(https://onvegetables.com/2022/05/19/vcr2022-3/#peterborough)

Kemptville(https://onvegetables.com/2022/05/19/vcr2022-3/#kemptville)

Sudbury(https://onvegetables.com/2022/05/19/vcr2022-3/#sudbury)

Essex County





Chatham-kent County







VCR - Vegetable Crop Report - May 19th, 2022...con't

Norfolk County



Norfolk Total Precipitation per Month

Precipitation (mm)



Huron County



Huron County Total Precipitation per Month



Wellington County



Simcoe County



Wellington County Total Precipitation per Month



Simcoe County Total Precipitation per Month



VCR - Vegetable Crop Report - May 19th, 2022...con't

Durham County



Durham Total Precipitation per Month



Peterborough



Peterborough Total Precipitation per Month



Kemptville



Kemptville Total Precipitation per Month



Sudbury



Sudbury Total Precipitation per Month

