



Monday, August 08, 2022

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Anthracnose Update for Peppers

**Amanda Tracey—Vegetable Crops Specialist, OMAFRA and
Katie Goldenhar, Pathologist (Horticulture), OMAFRA**



On August 3, 2022 the first anthracnose lesion was reported on an early maturing banana pepper variety in Kent County. With the recent discovery of a new and more aggressive species of anthracnose (*Colletotrichum scovillei*) in 2021, it is important that growers in this area are aware of this occurrence.

All pepper fruit, from freshly set to fully mature, are susceptible to infection from this anthracnose species and should be protected by specific fungicides weekly. Table 1 outlines products currently available for use against anthracnose in peppers.

Active ingredient	Product	FRAC Group	Maximum # of applications per year	Pre-Harvest Interval (days)
copper sulphate	Copper 53W	M1	10	2
captan **	Catan 80 WSP	M4	3	3
pyraclostrobin	Cabrio	11	6	0
azoxystrobin/ difenoconazole	Quadris Top	11 & 3	3*	1
difenoconazole/ benzovindiflupyr	Aprovia Top	3 & 7	4*	1
difenoconazole/ pydiflumetofen	Miravis Duo	3 & 7	2*	0
fludioxinil/cyprodinil	Switch	12 & 9	3	0

Table 1. Fungicides registered on field peppers for the 2022 field season for anthracnose.

** Note that captan is an Emergency Use Label for one year.

For more information on anthracnose and management strategies, check out our post from March 14, 2022, [Anthracnose Control in peppers – the old and the new](https://onvegetables.com/2022/03/14/anthracnose-management-in-peppers-the-old-and-the-new/) (<https://onvegetables.com/2022/03/14/anthracnose-management-in-peppers-the-old-and-the-new/>).

If you suspect anthracnose in your crop please reach out to [Amanda Tracey](mailto:Amanda.Tracey@ontario.ca) (519-350-7134) or [Katie Goldenhar](mailto:Katie.Goldenhar@ontario.ca) (519-835-5792) for confirmation and support.

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- ◆ Late blight spore trapping update: no evidence of *Phytophthora infestans* sporangia in Chatham-Kent yet this year
- ◆ VCR – Vegetable Crop Report – August 4th, 2022
- ◆ Things to consider before purchasing garlic planting stock

Late blight spore trapping update: no evidence of *Phytophthora infestans* sporangia in Chatham-Kent yet this year

Joseph Tomecek (Tomecek Agronomic Services/M.Sc. candidate, Dept. of Plant Agriculture, Univ. of Guelph); Amanda Tracey, Vegetable Crops Specialist, OMAFRA, Dr. Cheryl Trueman, Ridgeway Campus, University of Guelph



Since June 6 of this year, a project has been underway to assess Spornado and rotorod devices for the capture of *Phytophthora infestans*. At eight locations setup across the municipality of Chatham-Kent, there have been zero detections of *Phytophthora infestans* DNA that would indicate the presence of sporangia. The project will continue until the end of August.

For more information on this project, see our previous article(<https://onvegetables.com/2022/06/24/spore-traps-monitoring-for-causal-agents-of-tomato-late-blight-in-chatham-kent/>) posted on June 24.

If you suspect late blight in your tomato (or potato) crop, please reach out to Amanda Tracey (Amanda.tracey@ontario.ca, 519-350-7134) or Cheryl Trueman (ctrueman@uoguelph.ca, 226-971-0654) to confirm diagnosis.

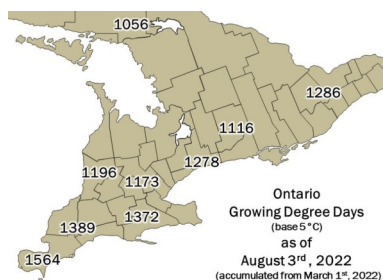
Late blight was confirmed(<https://onvegetables.com/2022/07/26/late-blight-update-july-26-2022/>) in eastern Ontario (Ottawa County) in late July this year.

Project collaborators: Yaima Arocha Rosete and Kristine White (Sporometrics), Hervé van der Heyden (Phytodata), and Genevieve Marchand (AAFC).

Funding acknowledgement: Ontario Tomato Research Institute, Fresh Vegetable Growers of Ontario, and the Ontario Agri-Food Innovation Alliance.

VCR – Vegetable Crop Report – August 4th, 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 – Most regions continue to match or surpass their 10 year average GDD with the exception of Peterborough which lags below but still follows the upward trend. Daytime temperature remain high in the mid-20s to low 30s over the next week, starting higher over the weekend before dropping slightly into the week. Nighttime temperatures are expected to range in the mid-teens to mid-20s across the province.

Precipitation – Many regions received at least some rain over the past week. Huron in particular received ~63mm yesterday and has now received almost its total cumulative precipitation for August just over the past 3 days. Rain with a chance of thunderstorms is

in the forecast over the weekend and into next week in most regions.

Crop Updates

Brassica Crops – The dry weather has led to lower levels of Alternaria and other fungal pathogens, but has led to smaller stunted plants in some fields and tip dieback in others. Nutrient disorders have been common with head brassicas. In areas that have received adequate levels of moisture, white mould has been observed and the chance of bacterial rot is higher. The second and third generation of cabbage maggot are active different regions. When scouting blocks, continue to dig up wilted plants and inspect the roots for maggots, clubroot or nematodes. After blocks are harvested, be sure to incorporate all crop residue in the soil to reduce the amount of inoculum available to infect later plantings.

Celery – Early plantings of celery are being harvested. Blackheart/calcium deficiencies have been observed in low levels and conditions have been conducive for celery leaf curl. Avoid working in fields when the humidity is high, and the leaves are wet as celery leaf curl spores will stick to clothes and equipment. Leaf hopper counts are moderate to high in some areas, but the amount of Aster yellows remains low. Continue to dig up stunted plants weekly to examine the roots for nematodes, the hearts for carrot weevil damage or blackheart.

VCR – Vegetable Crop Report – August 4th, 2022...con't

Garlic – Monitor humidity levels while you are curing the harvested crop. Curing / drying is often associated with an increase in temperature, however, when it comes to curing garlic, relative humidity should be the primary focus. Heating air increases the amount of moisture that the air can hold per cubic metre. A cubic meter of air can hold ~17 grams of water vapour at 20°C, while at 30°C it can hold ~30 grams. In most years, when the ambient air's relative humidity is low, increasing the temperature greatly increases the water holding capacity of the air. Keeping the relative humidity low and curing the crop quickly has shown to be the best way to avoid garlic mites (<https://onvegetables.com/2021/12/09/stored-garlic-might-have-mites/>), fusarium development, and improve storage longevity. Good air circulation through totes, pallet boxes or baskets that reach all bulbs evenly will help to reduce over-curing some bulbs or under-curing others. Curing is complete when the bulb wrappers are crispy, the middle of the cut stem is hard, and the base of the stem is dry when cloves are removed. After harvest, incorporate field debris to reduce the likelihood of leek moth completing its lifecycle.

The **Garlic Growers Association of Ontario (GGAO)** is taking orders from members for clean planting material from the SPUD unit at the New Liskeard Agricultural Research Station, University of Guelph. GGAO members should E-mail garlicgrowersofontario@gmail.com as soon as possible to place an order. Roundels are expected to ship in September. For more information, see the garlic clean seed program here: <https://onvegetables.com/2020/08/05/spud/>.

The next **garlic workshop** is **August 19th** from **9:30-4:30** near **Janetville, ON**. This workshop will focus on production and pest management of growing garlic in Ontario. Topics include clean seed production, cultivar selection, seeding spacing and density, crop insurance, weed control, pathogen and insect identification and management, crop rotation, scaping, upgrading equipment, cleaning, grading, curing and storage. Please register by contacting OMAFRA's Agricultural Information Contact Centre by calling 1-877-424-1300 or filling out this registration form online: <https://survey.clicktools.com/app/survey/go.jsp?iv=1y59n0qcz8rld>.

Onions – Some early transplanted fields are lodging. Tip dieback is becoming more prevalent with *Stemphylium*, purple blotch, and bacterial leaf spot being observed as well. Areas with cooler nights, higher humidity and prolonged leaf wetness, have had favourable conditions for downy mildew development (Figure 1). Research at the Ontario Crops Research Centre – Bradford (Muck Station) has shown that Orondis Ultra (groups 40/49), Zampro (groups 45/40) and Ridomil Gold MZ (groups 4/M3) are the most effective at preventing disease development. Products containing mancozeb have shown to be effective if they are applied prior to downy mildew infection. The level of thrips have been low to moderate in most areas.



Figure 1 – Onion downy mildew will start as a tan lesion with purple-grey, velvety growth. Diseased leaves turn pale-green, yellow, and then collapse. Usually starts as a small patch then quickly spreads throughout the field – August 22, 2019.

Pumpkin and Squash – Powdery mildew infections are starting to increase. Powdery mildew is usually the most significant disease in pumpkins and squash, not to be confused with downy mildew which is more prevalent in cucumbers and melons. The fungicide controls for the two diseases are quite different, downy mildew fungicides will provide little control of powdery mildew (and vice versa). Powdery mildew controls are most effective if applied at the first sign of disease. Look for lesions of white fungal hyphae on the lower leaf surface or the leaf petioles.

Sweet corn – With August comes increased insect pest pressure. Summer storms originating in the southwest often carry both corn earworm and fall armyworm moths into the Great Lakes basin. These 4th instar fall armyworm larvae were found in sweet corn near Ridgetown (Figures 2 and 3). Scout regularly for signs of feeding, frass or egg masses. For sweet corn in the pre-tassel stages, pyrethroid sprays offer control of fall armyworm and western bean cutworm. For corn earworm control during silking, either a group 28 insecticide (Coragen or Voliam Xpress) or Lannate (group 1A). There is widespread resistance to pyrethroids in the corn earworm population.

VCR – Vegetable Crop Report – August 4th, 2022...con't



Figure 2 – Fall armyworm larvae found recently on sweet corn in Ridgetown

Figure 3 – Fall armyworm damage and frass on sweet corn in Ridgetown



Pest Degree Day Forecasting

*NOTE: Data as of August 3rd, 2022

County	Carrot Rust Fly	Onion Maggot	Carrot Weevil	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*	1824	1693	1321	1101	808	1440	1693	999
Chatham-Kent*	1636	1510	1157	949	638	1271	1510	854
Norfolk**	1618	1493	1140	924	606	1255	1493	825
Huron***	1436	1316	974	768	469	1083	1316	673
Wellington**	1409	1290	950	746	451	1060	1290	656
Simcoe County***	1433	1313	977	772	478	1085	1313	680
Durham***	1522	1397	1050	841	529	1161	1397	743
Peterborough	1352	1232	894	695	408	1002	1232	603
Kemptville***	1535	1408	1062	858	546	1170	1408	761
Sudbury***	1258	1156	859	675	396	957	1156	589

*- 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](#)(

[Chatham-Kent County](#)(

[Norfolk County](#)(

[Huron County](#)(

[Wellington County](#)(

[Simcoe County](#)(

[Durham County](#)(

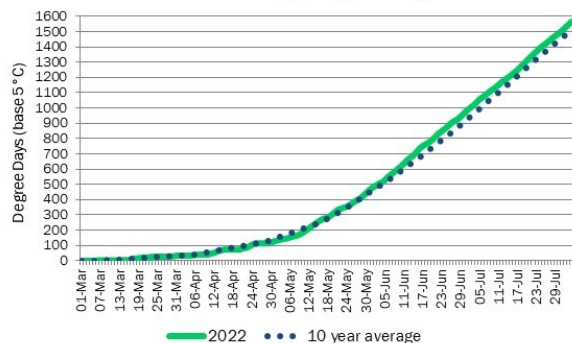
[Peterborough](#)(

[Kemptville](#)(

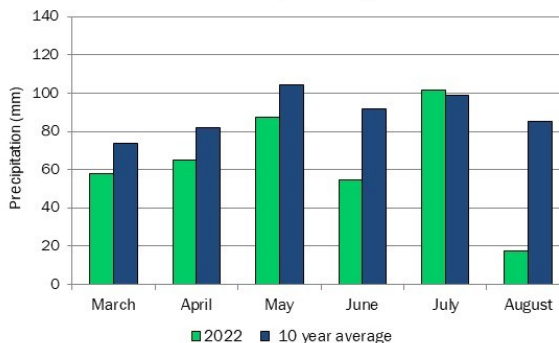
[Sudbury](#)(

Essex County

Essex Growing Degree Days



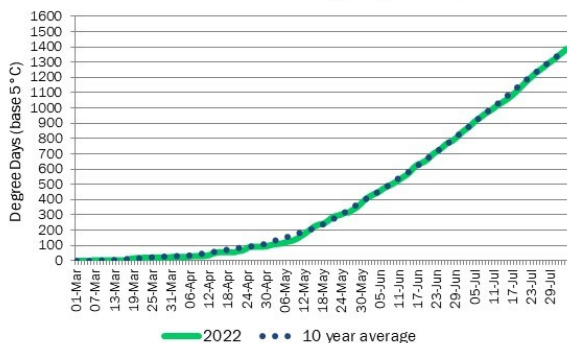
Essex Total Precipitation per Month



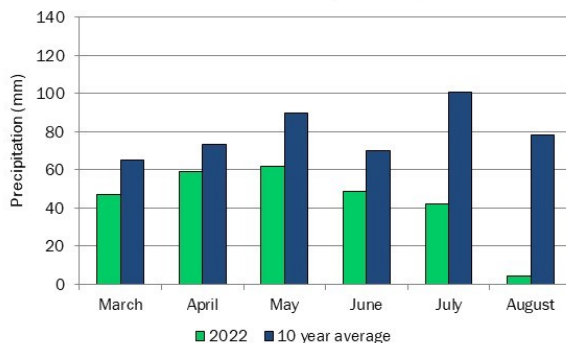
VCR – Vegetable Crop Report – August 4th, 2022...con't

Chatham-kent County

Chatham-Kent Growing Degree Days

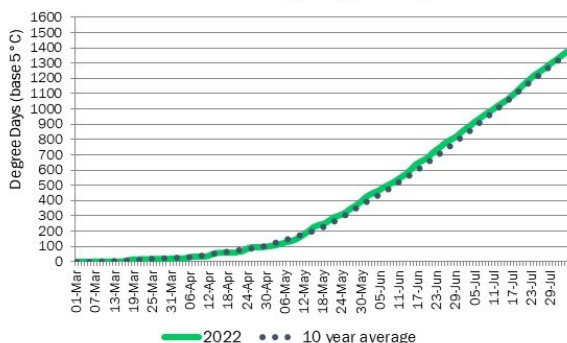


Chatham-Kent Total Precipitation per Month

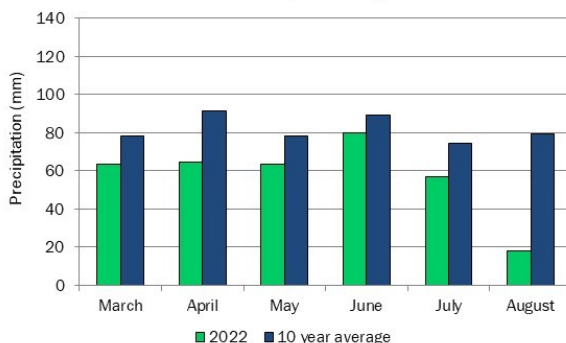


Norfolk County

Norfolk Growing Degree Days



Norfolk Total Precipitation per Month

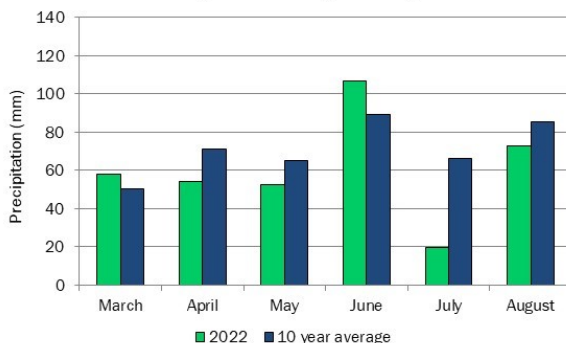


Huron County

Huron County Growing Degree Days



Huron County Total Precipitation per Month

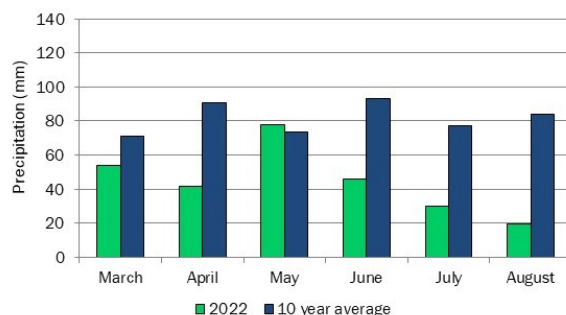


Wellington County

Wellington County Growing Degree Days



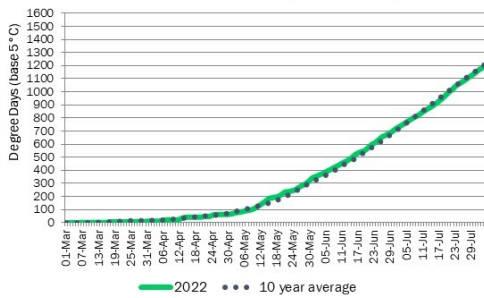
Wellington County Total Precipitation per Month



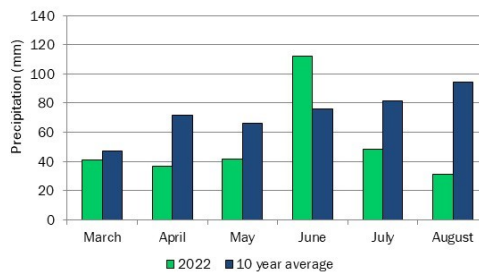
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Simcoe County

Simcoe County Growing Degree days

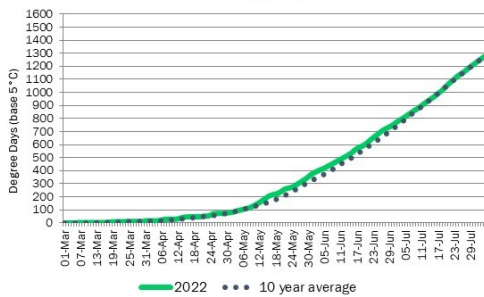


Simcoe County Total Precipitation per Month

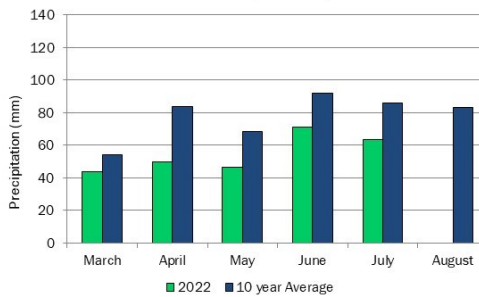


Durham County

Durham Growing Degree Days

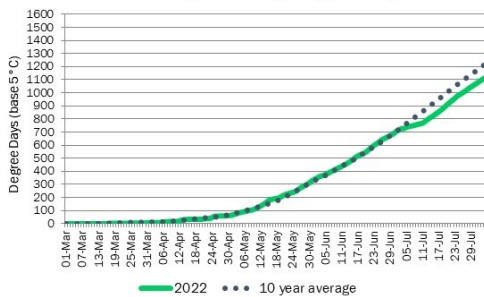


Durham Total Precipitation per Month

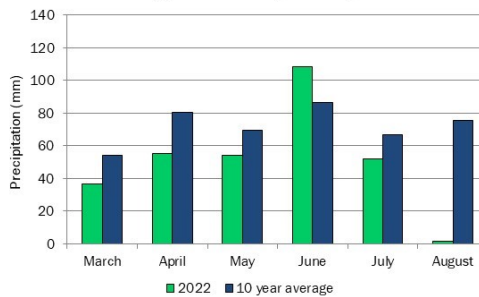


Peterborough

Peterborough Growing Degree Days

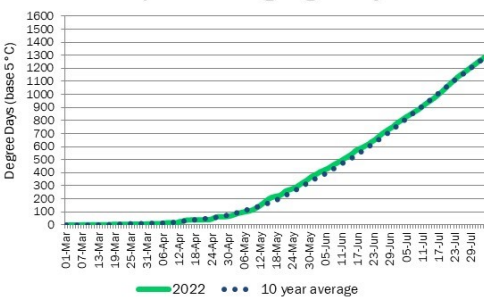


Peterborough Total Precipitation per Month

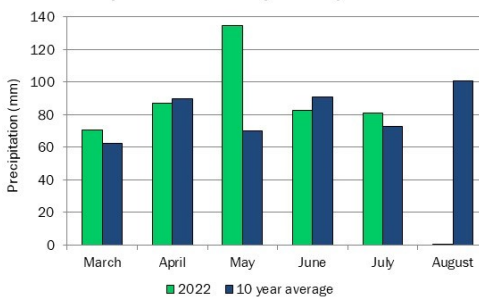


Kemptville

Kemptville Growing Degree Days

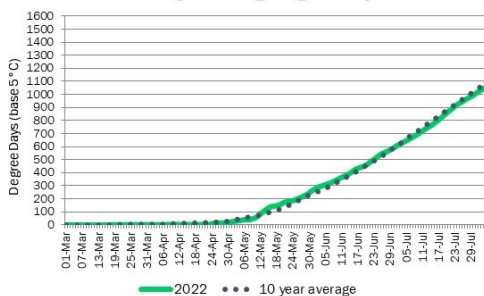


Kemptville Total Precipitation per Month

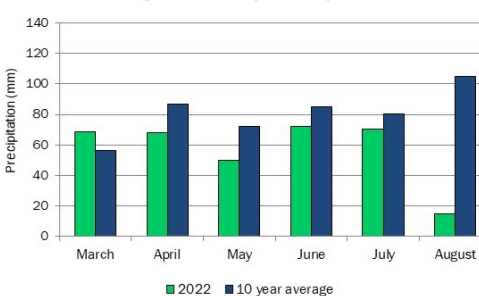


Sudbury

Sudbury Growing Degree Days



Sudbury Total Precipitation per Month



Things to consider before purchasing garlic planting stock

Travis Cranmer, Vegetable Crops Specialist, OMAFRA

There is a lot of enthusiasm around growing garlic in Ontario. There are a few things that should be considered before starting this crop to ensure years or even decades of successful production.

Garlic is an asexually-propagated crop, meaning that each generation is a genetic clone of the previous generation. Asexually propagated crops can also pass along diseases to the next generation; pathogens that were in the mother plant are planted as daughter cloves the following season.

Here are some things to consider before purchasing new planting stock or trying garlic as a new crop;

- Start small, go through the entire process of planting, growing, harvesting and selling a crop before investing in large equipment
- Test planting stock for stem and bulb nematode before planting; the nematode lives in the clove and often is not noticed until their populations reach high levels in the third or fourth year of growing; the ~\$50 test could save you from crop failure three to four years from now



Stem and bulb nematode causing rot above the basal plate

- Ask the planting stock seller if they have ever had white rot (*Sclerotium cepivorum*) on their farm; this pathogen very destructive and makes the plants unmarketable. **There are no pesticides or management strategies that can control white rot other than prevention; spores can persist in the soil for at least 40 years**



White mycelium growing on onion bulb with black sclerotia present – White rot also infects garlic and has been observed on garlic in 2022.

- Hardneck cultivars are the most common cultivar with ‘Music’ being the one that tends to be grown the most; see a list of Ontario planting stock providers here: <https://www.garlicgrowersofontario.com/market-place-buy-sell>
- Most growers plant in September-October; planting early could allow the plant to bolt and not overwinter, planting late limits adequate root growth before winter that is required for optimum yields
- Plant only cloves that appear in good condition; rogue out cloves with nicks, bruises, lesions or holes caused by insects
- Planting density depends on tractors/equipment/weed control methods and whether bulb size or yield is valued more; an average of 1200 lbs/acre of planting stock is required with rows being 18” apart and 6” between plants within the row
- Irrigation is key in dry years; a dry year could expect an average yield loss of 35% where an average year you could expect 10% loss
- Scapes in hard neck cultivars are best removed in early June by hand to increase bulb size
- Harvest when 40-60% of the leaves turn yellow (often 2nd-3rd week in July) and remove harvested bulbs from direct sun
- Cure by reducing humidity until the outer skins are dry and crispy, the center of the cut stem is hard, and the neck is constricted at the bulb
- Avoid planting garlic in the same area for at least 4 years to reduce the chance of pests and pathogens building in the soil

Things to consider before purchasing garlic planting stock...con't

Types of Garlic Planting Stock

Types of planting stock	Definition	Pros	Cons
Conventional planting stock	General planting stock sold in the marketplace	-Most economical option available	-May have nematodes or other pathogens present; always test samples before planting and keep separate from other plantings for three years
Nematode-free planting stock	Planting stock that in theory, has been tested for stem and bulb nematode and is from fields that do not have stem and bulb nematode present	-Free of stem and bulb nematode means no surprises / crop failure 2-3 years from now	-May be marketed as nematode-free when in fact it is not; test a sample of cloves prior to planting; relies on trust with the seller
Certified Organic planting stock	Planting stock from a field that is certified organic. Certified to meet the requirements of an organic certification body	-Can charge a premium if organic certification status is maintained going forward	-May have nematodes present; always test samples before planting and keep separate from other plantings for three years
Clean Seed / Roundels / Clean Planting Stock	-Roundels (0.3-2 gram planting stock) that are from a clean-seed program(https://onvegetables.com/2020/08/05/spud/) that are tested and known to be free of known garlic viruses, nematodes and all other garlic pathogens	-Free of viruses and nematodes can potentially increase yields by 25-50% compared to conventional planting stock once it is has been grown for 2-3 years	-Most expensive -Limited number of roundels available yearly for purchase by members of the Garlic Growers Association of Ontario (https://www.garlicgrowersofontario.com/)
Clean Seed / Successive generations of Clean Planting Stock	-Bulbs produced from roundels from a clean-seed program	-Increased vigour, and low levels of pathogens present depending on how each generation was grown from the roundel	-Limited amounts of 2+ generation planting stock available for purchase -Will not remain 'clean' if planted in fields with stem and bulb nematode or other pathogens present

Table 1. Types of Garlic Planting Stock. While '**garlic seed**' is a commonly used in place of 'planting stock', the term 'seed' is normally used to describe sexually-propagated plants with true seeds. Planting stock is a more accurate term to describe an asexually-propagated crop like garlic.

Interested in more information? Attend a garlic production and pest management workshop for a detailed breakdown about growing garlic Ontario. Topics include cultivar selection, seeding spacing and density, crop insurance, weed control, pathogen and insect identification and management, crop rotation, scaping, clean seed production, upgrading equipment, cleaning, grading, curing and storage. Subscribe to the ONvegetables.com blog for a notification when the next workshop is scheduled. Currently, the next workshop is scheduled for August 19th, 2022(<https://onvegetables.com/2022/05/27/garlic/>) in Janetville, ON.