Cornell University
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Eastern New York Commercial Horticulture

Vegetable News

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Vine Crops Update

Charles Bornt–ENYCHP

I knew that we would be seeing *Phytophthora capsici* or Phytophthora blight showing up in vine crops sooner or later and the later is now! Late last week I saw both fruit (Figure 1) and foliage symptoms (Figure 2) on pumpkins. Phytophthora blight (Pcap) is a water loving pathogen that can affect all parts of the plant, especially the fruit. To complicate the matter, fruit can be infected but show no symptoms until you place it in a bin or out for display and they literally melt. The first symptom you will see is a dark circular, sunken, water logged spot on the fruit, particularly on the side contacting the soil. From there, a white, yeast-like growth will form. It can take very little time at all for the pathogen to breakdown a fruit. Pcap fruit symptoms can also be easily confused with Pythium Cottony Leak (Figure 3), but the difference is that Cottony Leak is much "fluffier" compared to Pcap.

Figure 1: Phytophthora capsici infected fruit – note the white yeasty growth.

Figure 2: Phytophthora capsici foliar symptom. Note the lighter green area around the darker lesion.

Management of this pathogen is hard if not near impossible. It survives for years in soils (7 – 10 or more) and has a pretty wide host range. The best control is to avoid it, but as more and more fields seem to be flooding recently, this is also hard to do. The best plan of action is to have a preventative fungicide program in place. There is a little bit of good news here as many of the fungicides labeled for Cucurbit Downy Mildew are also labeled

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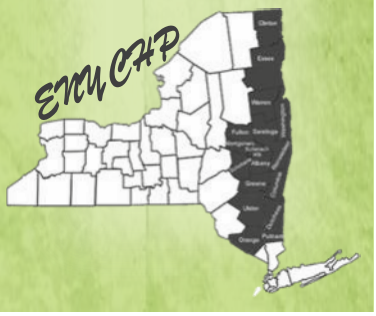

and effective for Pcap. According to our Plant Pathologist Meg McGrath, they include Ranman (6 applications, no more than 3 sequential), Omega (4-7 depending on rate), Presidio (2, none sequential; this is a recent label change), Gavel (8), Forum (5, 2 sequential) or Revus (4, none sequential), and Tanos (4, none sequential). A phosphorous acid fungicide is recommended included with these; there are no limits to their use. See the full chart on the next page for more details on fungicide options.

Figure 3: Cottony Leak sporulation on a cucumber fruit – note the light fluffiness compared to the yeasty/powdery spores of Pcap. Photo: M. Morningstar

You can also help by removing or destroying affected plants by disking the infected area plus a buffer area if feasible. Before that, I would recommend making sure that you have a specific Pcap fungicide applied before doing any disking. If you have Pcap infested fruit on your farm, do not just throw them in a compost pile or spread them in a field that is not infected. Either dig a hole somewhere away from your production areas and bury them or put in a dumpster and get rid of them. If you have nowhere else to dispose of them, put them back in the infected field they came from. Minimize the amount of traffic in and out of the infected production area. The disease is not only spread by water, but can also be spread through the moving of soil from one field to another by equipment. Once you have harvested the field and it dries up enough, plow down and incorporate the residue as soon as possible to reduce the number of overwintering spores the pathogen can produce.

Pumpkin and Winter Squash Storage Reminders

I thought it might be worth putting this note in this week as we near the first week of September and many of you are or will shortly be getting orders for pumpkins and winter squash. I want you to also think about this for a second – you spend 4 -5 months to grow and nurture this crop to harvest – you spray it, you fertilize it and the last thing you want to do is handle it improperly when it now starts to pay you back!

· Handle squash and pumpkins as gently as possible to avoid bruising or cutting the skin. Wounds will allow soft rot bacteria and other disease such as Black rot to invade and reduce the storage life of your fruit.

· Avoid picking up pumpkins and squash that is wet with dews or recent rain. This increases the risk of pressure bruise and breakdown, especially if they will need to sit in any kind of bin for any length of period.

· If possible, try curing your squash to encourage cuts or bruises to heal over. Place in windrows in the field (this also allows the stem ooze to dry up) especially if the weather is going to be warm and dry for several days or by placing squash in a warm, dry atmosphere (70-80°F) with good air movement such as a well ventilated garage or barn if temperatures can be maintained. Greenhouses or high tunnels with fans turned on also work nicely.

· Be sure not to pile fruit too high in the bins especially if they will be stacked on top of one another. Pressure bruise is another way to decrease fruit quality and storage potential.

· Try to avoid as much chilling injury as possible and it is very important to try and remove fruit from the field before a frost. Chilling injury occurs when squash is exposed to temperatures below 50°F in the field or in storage and is cumulative over time so the more they are exposed the more chilling injury will occur. This is more important for squash that will be stored long term than for pumpkins, but still impacts pumpkin quality and storage as well.

· After curing, move squash or pumpkins to a dry, well ventilated storage area. Store squash at 55-60°F with a relative humidity of 50-70%. If humidity levels are lower than that, moisture is removed from the fruit resulting in "pithiness" or shriveling. Humidity higher than that results in conditions that favor decay organisms.

Lastly, and I know many of you have heard me say this before – when moving bins around either in the field or in the yard, take your time. I've been on many of your farm roads and fruit can really get tossed around in those bins if you are driving fast on those bumpy roads. Same with forklifts and jostling fruit around – take your time and do it right.

Mobile Fungicides for Managing Powdery Mildew, Downy Mildew, and Phytophthora Blight in Cucurbits

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Fungicide	FRAC Code	Diseases	Recommended Rate/A (labeled)	REI	PHI	Seasonal Limits	Approx.$/ A/spray
Vivando	U6	Powdery mildew	15 fl oz	12 h	0 d	3 sprays	$33.15
Torino [a]	U8	Powdery mildew	3.4 oz	4 h	0 d	2 sprays	$24.00
Quintec [b, c]	13	Powdery mildew (melon, pumpkin, w. squash, gourd)	6 fl oz (4-6)	12 h	3 d	24 fl oz	$23.60
Proline [c]	3	Powdery mildew	5.7 fl oz	12 h	7 d	2 sprays	
Procure [c]	3	Powdery mildew [c]	8 fl oz (4-8)	12 h	0 d	40 fl oz	$36.84
Merivon [c]	7 + 11	Powdery mildew	5.5 fl oz (4-5.5)	12 h	0 d	3 sprays	
Pristine [c]	7 + 11	Powdery mildew [c]	18.5 oz (12.5-18.5)	12 h	0 d	4 sprays (74 oz)	$70.85
Ranman [a, d]	21	Blight, Downy mildew	2.75 fl oz (2.1-2.75)	12 h	0 d	6 sprays	$25.24
Zampro	40 + 45	Blight, Downy mildew	14 fl oz	12 h	0 d	3 sprays	
Forum	40	Blight, Downy mildew	6 fl oz	12 h	0 d	5 sprays	$17.86
Revus [a, c]	40	Blight, Downy mildew (low efficacy DM cucumber)	8 fl oz	12 h	0 d	4 sprays (32 fl oz)	$30.31
Phostrol, etc.[f]	33	Blight, Downy mildew	2.5 – 5 pt	4 h	0 d	7 sprays	$11.44 – $22.88
Presidio [g]	43	Blight, (Not recommended now for DM due to resistance) [c]	4 fl oz (3 – 4)	12 h	2 d	3-4 sprays (12 fl oz)	$44.94
Tanos [e]	27 + 11	Blight, Downy mildew	8 oz	12 h	3 d	4 sprays	$25.02
Zing!	22 + M	Downy mildew	36 fl oz	12 h	0 d	8 sprays	$17.72
Curzate [e]	27	Downy mildew	3.2 oz	12 h	3 d	9 sprays	$13.26
Previcur Flex[c]	28	Downy mildew [c]	1.2 pt	12 h	2 d	6 pints	$18.32

[a] Organosilicone and/or non-ionic surfactant required (Revus) or recommended.
[b] Quintec is not labeled for use on edible-peel cucurbits. 10-14 day spray interval.
[c] Limited use recommended because resistance suspected of affecting efficacy especially when applied often.
[d] Rate range applies for downy mildew; high rate for blight. [e] Short residual; apply another fungicide within 5 days.
[f] Other phosphorous acid fungicides include ProPhyt and Fosphite. Rate and seasonal limits vary a little among products. Recommended tank mixed with other fungicides. Note that there are also phosphate fertilizers, which are not fungicides.
[g] Plant-back restriction for most non-labeled crops is 18-month for Presidio.

Tank-mix each of these fungicides with a protectant, with the exception of Zing! (or Gavel), which are formulated with chlorothalonil or mancozeb. Need to tank-mix is specified in use directions on many labels.

Sulfur is a very effective, inexpensive product for powdery mildew, no efficacy for other diseases.
Oils (several botanical and mineral oils available) are also a good choice for powdery mildew only.
Chlorothalonil and copper have broad-spectrum activity. Copper also effective for bacterial diseases.
Mancozeb is recommended when only downy mildew is occurring.

Apply fungicides for a particular disease in alternation to manage resistance (in the use directions on many labels; typically 1 or 2 consecutive spray maximum) and to ensure effective control if resistance develops.

QoI* and Ridomil fungicides are not recommended due to resistance. (*Amistar, Cabrio, Quadris, Flint).

Managing Bacterial Diseases in Onions

Crystal Stewart—ENYCHP

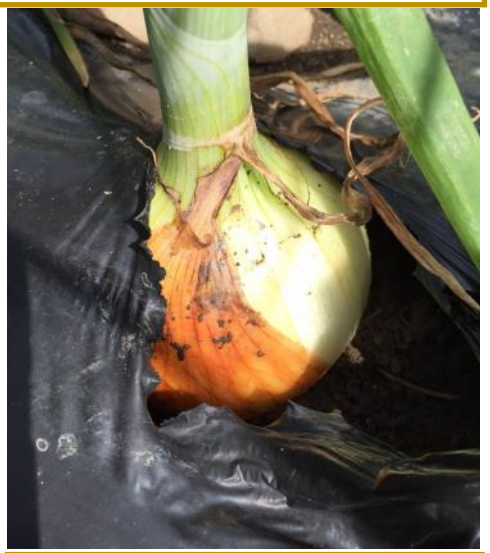
There are pockets of higher-than average bacterial rot throughout the region, which is not great news for growers hoping to have storage onions. Bacterial issues can be detected during the growing season often by looking for just one or two flagging leaves, often more towards the center of the plant. These leaves will die right into the bulb, either leaving one scale dead or spreading and causing soft rot of the bulb. Christy Hoepting and Dr. Steve Beer wrote a nice article a few years ago detailing the IPM strategies for combatting bacterial diseases and reducing their spread:

An onion with dead center leaves (left) and internal decay (right). This plant was also being restricted at the neck by tight plastic. cls

1. Choose less susceptible cultivars.
2. Limit amount of pre-plant applied nitrogen fertilizer. Many feel that 100 pounds or less N per acre is appropriate.
3. Use water free of bacterial pathogens for spraying or sprinkler irrigation.
4. Avoid sprinkler irrigation, especially late in the season.
5. Maintain effective control of thrips, especially late in the season.
6. **Pull/undercut onions when at least 50% of the leaves are down and during dry weather.**
7. Do not top onions until neck tissue is completely dry (not green).
8. Harvest during dry conditions.
9. Harvest and handle bulbs gently
10. Maintain dry conditions during curing.
11. Pre-grade suspect lots of onions to eliminate rotten bulbs prior to storage.
12. Store bulbs at 32 °F to 37 °F (0 °C to 2 °C) after dry.
13. Avoid condensation forming on onions by circulating warm air over cold onions.

Open the plastic around your onions

If growing onions on plastic and the plastic becomes tight around onions due to small planting holes (which were of course a great weed control strategy earlier), it may be necessary to slice the plastic and increase air movement around the bulbs. The hot, moist environment under the plastic is perfect for bacterial growth, and the plastic directly contacting bulbs can cause physical damage, allowing another entry point for pathogens. Cut slits along each side of the rows, avoiding the drip, as the onions size. Another solid strategy for future years is to use biodegradable mulch on onions. It will start to break down as the onions size, automatically providing the needed ventilation.



This onion had grown up tight with the plastic, creating a very warm little tent around it. This environment strongly contributes to rot.

Source: Update on Bacterial Diseases of Onion: Detecting Bacterial Pathogens, Bacteria in Soil and Water, Suppressive Soil, Varietal Susceptibility and the Effect of Actigard® on Bacterial Decay Steven Beer, Jo Ann Asselin, and Jean Bonasera, Plant Pathology and Plant-Microbe Biology, Cornell University and Christy Hoepting, CCE Cornell Vegetable Program

Spider Mites in Tunnels

Amy Ivy, ENYCHP

Spider mites, specifically two-spotted spider mites (TSSM), have been on the rise in high tunnels this month especially on tomatoes, cucumbers and eggplants. They are tiny and quite difficult to see, but the damage they do is distinctive. Look for a 'salt and pepper' kind of stippling on the leaves then turn the leaves over to look for the tiny mites, their golden spherical eggs, or in cases of extreme infestation their very fine webbing. A hand lens can be helpful in confirming your suspicions.

Both conventional and organic growers can use biological controls (predators) in the earliest stages of infestation, but once the population explodes, as in the photo of a tomato leaf above, the predators will not be able to suppress the mites. Our colleague from the Cornell Vegetable Program, Judson Reid has these comments:

Releases of predators must begin very early. Phytoseiulus persimilis can be effective, but requires high relative humidity to survive, so may require repeat releases. Other beneficials to control TSSM include Feltiella acarisuga and Amblyseius californicus. Also, P. persimilis doesn't navigate the trichomes (hairs) of tomato leaves very well so they should be applied to hot spots and/or combined with A. californicus. Biocontrol is suitable for both conventional and organic farmers. The spray options for organic control are limited to oils that encapsulate the mite when applied at high pressure to the underside of foliage. Two-spotted spider mites overwinter in NYS in the soil or crop debris. Controlling weeds and reducing dust (with mulch) are the first preventative steps.

For conventional growers Judson prepared the following table listing spray options for inside tunnels that have broad labels, short PHI's and rotating modes of action.:

Material	PHI (days)	Comments
Acramite (bifenazate)	3	Limited to one application per season
Portal XLO (fenpyroximate)	1-cucumber, beans, tomato 3-melon	Toxic to fish and aquatic life.
Capture EC (bifenthrin)	1-Sweet Corn, 3-Cucurbits, Eggplant-9, Pepper-7, Tomato-1	Toxic to fish and aquatic life.
Danitol 2.4 EC (fenpropathrin)	Tomato-3	Also labeled for Whitefly control when mixed with Belay insecticide

FYI

Uihlein Potato Farm in Lake Placid Seeks Land Use Input

The Uihlein Potato Farm of Cornell University in Lake Placid continues to produce disease-tested, high-value seed potatoes as a service to NY growers and the State of New York. The New York State Foundation Seed Potato Program is focusing efforts on greenhouse and laboratory production, and beginning in 2018 will no longer be engaged in field production. As such, they are soliciting suggestions for land use from Cornell Faculty, Cooperative Extension educators, and private growers.

The significant ongoing costs for this facility include land maintenance, and mowing and preservation of terraces and fields. In order to cover these costs, the NYS Foundation Seed Potato Program is interested in exchanging land use for land maintenance services and welcome any suggestions or proposals. For more information contact Chris Nobles (cmn5@cornell.edu), Farm Manager, or Keith Perry (klp3@cornell.edu), Director, New York State Foundation Seed Potato Program.

Sun Scald on Peppers and Tomatoes

Ethan Grundberg, ENYCHP

The numerous foliar diseases affecting tomatoes and peppers (bacterial spot and speck, septoria, early blight, bacterial canker, and more!) are causing a secondary abiotic issue in those crops: sun scald. As plants lose their leaves in the battle against bacterial and fungal pathogens, developing fruit are directly exposed to sun rays. During stretches of hot, dry, sunny weather, this direct exposure can destroy the fruit tissue and cause large tannish white lesions. The areas affected by sun scald are very susceptible to secondary infection by fungal pathogens, especially black mold, as seen in the tomato picture above.

Options to mitigate sun scald on fruit are limited at this point in the season. Some research has been done in Delaware showing great efficacy from hanging 50% shade cloth directly on tomato trellises in the field to reduce sun scald and improve quality. For indeterminate tomatoes, especially later successions that are still pushing significant vegetative growth, adding some extra nitrogen to either a foliar feed or fertigation plan to encourage lush leaf development can help save future fruit from damage (though sun scald incidence also declines later in the season as day lengths shorten and the angle of the sun rays also decreases). Sun scalded fruit should be picked and discarded as soon as possible to avoid more energy investment in their development and take away that source of secondary pathogen food.

Growers who battle sun scald every year might need to go back to the drawing board this winter to make some tweaks in the production system. First, selecting varieties bred for broad leaves, especially for sweet peppers, can certainly help. Second, reviewing fertility management plans to ensure adequate N is provided during the growing season to promote full leaf development is a must. Third, staking and trellising peppers to maintain an upright orientation that minimizes direct exposure of fruit to sun rays can be effective, but always needs to be weighed against the cost of labor required to maintain them (and whether your tractor has enough clearance to travel over stakes for mechanical cultivation and foliar feeding). Finally, assessing the primary foliar diseases on your crop should inform the development of a preventative spray program to help avoid defoliation.

For the Birds!

Maire Ullrich, ENYCHP

Some of the bird populations I have seen in sweet corn fields these past couple of weeks would have Alfred Hitchcock himself concerned. For some fields, it is too late to un-do the damage. But, for the future, here are some good resources on keeping populations from totally decimating your crops:

Recent article comparing air cannons, air dancer (those inflatable car dealership guys) and Avian Control:
http://www.hort.cornell.edu/expo/proceedings/2016/Sweetcorn.Evaluating%20novel%20techniques%20for%20bird%20management%20in%20sweet%20corn.Telenko.pdf

Cornell Mammal Control Guidelines:
https://nysipm.cornell.edu/agriculture/vegetables/vegetable-ipm-practices/chapter-5

Wildlife Management for Vegetables:
http://www.hort.cornell.edu/expo/proceedings/2017/WildlifeMGMT.Vegetable%20Crop.Curtis.pdf

Sweet Corn Update

Charles Bornt, ENYCHP

Over the last several weeks, I have been watching aphid populations in sweet corn and other crops slowly build. This week they have seem to really come on and I think it's time to think about a treatment if you have not been spraying for the other pests like Corn Earworm or Western Bean cutworm. Some buyers have a very low threshold for aphids on corn, so it's important to make sure you're paying attention. In high populations they can also cause indirect damage with their honeydew (a sugary substance that they secrete) which allows diseases like Sooty mold to get started on flag leaves and plant leaves. Usually control is obtained because we are using products such as Warrior II, Grizzly, Artic, Mustang Max or Lannate. But with more Coragen being applied and less of the above materials, we could be missing aphids. If you have not been using any Warrior II or other pyrethroids, consider adding them into your next worm spray or consider a specific aphid material such as Assail (1 DTH). **Coverage is essential for good aphid control!**

We are also seeing a spike in Corn Earworm (CEW) numbers this week in the Capital region, enough to trigger a 4-5 day spray schedule. Remember that fresh silking corn is the most susceptible to CEW, so be sure you are maintaining coverage on those plantings. The heat and fronts moving through this week will also probably increase the likelihood of CEW pressure in the region. We also saw a sharp increase in the number of Fall Armyworms (FAW) trapped this week and it is not hard to find damage in corn. Unlike CEW, FAW likes younger corn and can really do a fair amount of damage on young corn. Treating for European Corn borer and Western Bean Cutworm at the time of tasseling should control most of these worms.

Sweet Corn Pheromone Trapping Network 8/16 - 8/22

County	Corn Earworm	European Corn Borer-Z (Iowa)	European Corn Borer-E (NY)	Fall Armyworm	Western Bean Cutworm
Orange	3	0	0	29	9
S. Ulster	0	0	0	0	5
N. Ulster	2	1	2	na	na
N. Dutchess	1	0	1	na	na
Columbia	10	0	3	57	27
Greene	8	0	0	4	10
Albany					
Schoharie	0	0	0	0	0
Fulton	0	0	0	0	0
Saratoga	0	0	0	4	7
S. Washington	1	0	1	0	5
N. Rensselaer	0	0	0	0	2
S. Clinton	0	0	0	4	89
C. Clinton	1	0	2	2	61

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Please be advised that the table entitled "Fungicides labeled for use in POTATO for early and late blight disease management, 2017" found in last week's Vegetable News, Volume 5, Issue 17 contained incorrect Pre-harvest intervals for a number of the products listed. Below is a corrected version of the potato fungicides. The fungicides with incorrect information are in RED lettering. Please note that the "Fungicides labeled for use in TOMATO for early and late blight disease management, 2017" found on the same page were correct. Remember that you as the applicator are always responsible for reading the label and recording the information from the label. These tables are only meant to be a guide for quick reference. Please be sure to review all labels of the pesticides you apply prior to using.

Fungicides labeled for use in TOMATO for early and late blight disease management, 2017.

Name	Diseases	FRAC Group	REI	PHI	Rate/A
Curzate 60 DF	Late blight	27	12 h	3 d	3.2-5 oz
Forum	Late blight	40	12 h	4 d	6.0 fl oz
ProPhyt or OLP	Late blight	33	4 h	0 d	4 pt
Presidio	Late blight	43	12 h	2 d	3-4 fl oz
Ranman 400 SC	Late blight	21	12 h	0 d	2.1-2.75 fl oz
Ridomil Gold Bravo SC	Late blight	4	48 h	5 d	2.5 pt
Zampro	Late blight	45 + 40	12 h	4 d	14 fl oz
Zing!	Late blight	22 + M3	12 h	5 d	36 fl oz
Ariston	Late blight, Early blight	27 + M3	12 h	3 d	1.9-3.0 pt
Cabrio	Late blight, early blight	11	12 h	0 d	8-16 oz
Catamaran	Late blight, Early blight	M5 + 33	12 h	0 d	5-7 pt
Flint	Late blight, early blight	11	12 h	3 d	2-4 oz
Gavel 75 DF	Late blight, early blight	22 + M3	48 h	5 d	1.5-2 lb
Previcur Flex	Late blight, early blight	28	12 h	5 d	0.7-1.5 pt
Quadris F or OLP	Late blight, early blight	11	4 h	0 d	6.2 fl oz
Quadris Opti	Late blight, early blight	11 + M5	12 h	0 d	1.6 pt
Reason 500 SC	Late blight, early blight	11	12 h	14 d	4.0- 8.2 fl oz
Revus Top	Late blight, early blight	40 + 3	12 h	1 d	5.5-7 fl oz
Tanos 50 DF	Late blight, late blight	11 +27	12 h	3 d	6-8 oz
Bravo Weather Stik or OLP	Late blight, early blight	M5	12 h	0 d	1 3/8 – 2 ¾ pt
Champ or OLP	Late blight, early blight	M1	48 h	0 d	1.3 pt
ManKocide	Late blight, early blight	M3 + M1	48 h	5 d	1-3 lb
Dithane DF Rainshield	Late blight, early blight	M3	24 h	5 d	1.5 lb
Endura 70 WDG	Early blight	7	12 h	0 d	2.5-3.5 oz
Inspire Super	Early blight	3 + 9	12 h	0 d	16-20 oz
Priaxor	Early blight	7 + 11	12 h	0 d	4-8 fl oz
Quadris Top	Early blight	11 + 3	12 h	0 d	8 fl oz
Rhyme 2.08 SC	Early blight	3	12 h	0 d	3.5-7 fl oz
Scala SC	Early blight	9	12 h	1 d	7 fl oz
Serenade Opti	Early blight	44	4 h	0 d	14-20 oz
Sonata	Early blight	44	4 h	0 d	2-4 qt
Switch 62.5 WG	Early blight	9 + 12	12 h	0 d	11-14 oz
Ziram	Early blight	M3	48 h	7 d	3-4 lb

Fungicides labeled for use in POTATO for early and late blight disease management, 2017.

Name	Diseases	FRAC Group	REI	PHI	Rate/A
Curzate 60 DF	Late blight	27	12 h	14 d	3.2-5 oz
Forum	Late blight	40	12 h	4 d	6.0 fl oz
Omega	Late blight	29	12 h	14 d	5.5 fl oz
ProPhyt or OLP	Late blight	33	4 h	0 d	4 pt
Ranman 400 SC	Late blight	21	12 h	7 d	2.1-2.75 fl oz
Ridomil Gold Bravo SC	Late blight	4	48 h	14 d	2.5 pt
Zampro	Late blight	45 + 40	12 h	4 d	14 fl oz
Zing!	Late blight	22 + M3	12 h	7 d	36 fl oz
Ariston	Late blight, early blight	27 + M3	12 h	14 d	1.9-3.0 pt
Cabrio Plus	Late blight, early blight	11 + M3	24 h	3 d	2.9 lb
Catamaran	Late blight, early blight	M5 + 33	12 h	7 d	5-7 pt
Gavel 75 DF	Late blight, early blight	22 + M3	48 h	3 d	1.5-2 lb
Gem	Late blight, early blight	11	12 h	7 d	3.8 fl oz
Headline SC	Late blight, early blight	11	12 h	3 d	6-12 fl oz
Previcur Flex	Late blight, early blight	28	12 h	14 d	0.7-1.5 pt
Quadris Opti	Late blight, early blight	11 + M5	12 h	14 d	1.6 pt
Reason 500 SC	Late blight, early blight	11	12 h	14 d	4.0- 8.2 fl oz
Revus Top	Late blight, early blight	40 + 3	12 h	14 d	5.5-7 fl oz
Super Tin 80 WP or OLP	Late blight, early blight	30	48 h	7 d	1.87 oz
Tanos 50 DF	Late blight, late blight	11 +27	12 h	14 d	6-8 oz
Bravo Weather Stik or OLP	Late blight, early blight	M5	12 h	7 d	1 3/8 – 2 ¾ pt
Champ or OLP	Late blight, early blight	M1	48 h	0 d	1.3 pt
Elixir	Late blight, early blight	M5 + M3	24 h	7 d	1.2-2 lb
ManKocide	Late blight, early blight	M3 + M1	48 h	3 d	1-3 lb
Polyram	Late blight, early blight	M3	24 h	3 d	2 lb
Dithane DF Rainshield	Late blight, early blight	M3	24 h	3 d	1.5 lb
Endura 70 WDG	Early blight	7	12 h	10 d	2.5-3.5 oz
Quash	Early blight	3	12 h	1 d	2.5-4.0 oz
Polyram 80 DF	Early blight	M3	24 h	3 d	2.5-4.0 oz
Priaxor	Early blight	7 + 11	12 h	7 d	4-8 fl oz
Quadris Top	Early blight	11 + 3	12 h	14 d	8 fl oz
Rovral 4F or OLP	Early blight	2	24 h	14 d	1-2 pt
Scala SC	Early blight	9	12 h	7 d	7 fl oz