

Integrated
Cranberry Crop
Management
for Wisconsin

Cranberry

Crop Management Newsletter

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AN INTEGRATED APPROACH TO CRANBERRY GIRDLER MANAGEMENT IN WISCONSIN

Biology & Life History

Cranberry girdler can be a serious soil insect pest for growers in Wisconsin. It is one of the few cranberry insect pests that occur in every growing region. Although this particular species is located throughout the state, girdler is not necessarily a pest on all cranberry acreage therefore carefully monitoring your marsh to detect any potential problems is of the utmost importance. Cranberry girdler belongs to the Pyralidae family, also known as pyralid, grass, wax or snout moths of the order Lepidoptera (moths and butterflies). This complex of moths is also referred to as sod webworms and is widely known to be pests of cultivated and wild grasses. Girdler overwinters as full-grown larvae in a cocoon buried in the leaf litter on the beds. In the spring, larvae complete their development, pupate and start to fly as adult moths in June. Adult activity periods generally

occur from early June to mid-August with peak flight normally occurring during the last week in June or first week in July. Fortunately, there is only one generation per year. Cranberry girdler larvae damage the vines by attacking the roots and chew through the bark of the underground stems and runners sometimes completely severing the vine. More often, larvae will gnaw or 'girdle' the bark completely around the runners or stems. Depending on the severity of attack, larval feeding can weaken and reduce the vigor of the vine limiting production. Above ground foliage eventually becomes red or brown and under severe infestations, may eventually kill the vines beyond the point of attack. Damage from larvae can often times go undetected but usually can be found in August and continuing into September. The most notable damage is generally found the following spring after the winter flood has been removed and the plants start to grow out. Often times, the foliage drops off leaving areas or patches of dead vines where weed species can soon takeover. Injury from girdler is easily diagnosed by looking for the presence of larvae and chewing on the underground horizontal stems and runners during the summer months.

Contents:

An Integrated Approach to Cranberry Girdler Management in Wisconsin	1
Flash Back	4
Cranberry Flea Beetle	4
Rethinking the Corporation	5
WSCGA Summer Mtg	6

Scouting for Girdler and Economic Thresholds

Pheromone baits specific to capturing girdler moths are commercially available to growers and should be used to help monitor seasonal adult flight activity. Traps should be placed out in early June in suspected hot spots or areas that have had a history of girdler. In addition to using pheromone traps the sweep net can also serve as a monitoring tool however, adult moth activity can best be gauged by walking the fields and observing the amount of girdler moths that you “kick up”. If you determine that indeed they are girdler (fruitworm moths may look similar), carefully monitor your weekly trap counts. Currently, no economic thresholds have been established for girdler adults however based on experience, if average counts exceed 50 moths/trap (particularly if peak flight is sustained), keep a close eye out for any potential, subsequent larval activity. Remember too that trap counts can be greatly influenced by the weather. If the vines begin to show stress, become discolored or exhibit signs of dieback during the months of June-August, carefully check the underground portion of the plants for girdling or chewing of the bark. The best way to accomplish this is by following the upright(s) in question back to the runner portion of the plant to determine if there’s any damage and/or presence of larvae. Girdler larvae are generally clear or white to cream-colored with a brownish head and may reach a little over ½” in length. Food waste, excrement or “frass” (little tan to brown pellets) from the larvae is often times found in association with feeding.

Control Strategies

Viable management tools for girdler control are limited. However, by employing the use of multiple control tactics we’ll hopefully be able to keep this pest in check. The use and

practice of the following cultural practices and control options should help suppress girdler populations and hopefully reduce or prevent them from causing economic plant injury.

- **Cultural practices** such as sanding will help bury over wintering pupae in the soil and hinder the adult moths from emerging the following year. Routine sanding every three to five years should help prevent girdler from becoming established as a major pest problem. Another relatively new cultural practice that may have a positive influence on reducing larval infestations is grass control. Recent studies suggest that “newly hatched cranberry girdler larvae (neonates) need and prefer soft, succulent plant tissue at or below ground level to feed on to enhance their survival rate. In the cranberry bed, grasses are probably crucial for their survival. Newly hatched larvae become established on grass crowns or roots then move to cranberry at a later stage when their mandibles can better process woody substrate. If grasses can be prevented from growing in a bed, particularly during July and August when the eggs are laid, then the girdlers will also be prevented from establishing themselves in great numbers” (Fitzpatrick, 2005). Apart from grasses that are generally the preferred host plants, girdler is also known to attack cranberry, Sheep Sorrel, Three-square sedge and Douglas fir plantings.
- **Cultural controls** like flooding have proven to be very effective against girdler. A deep flood over the top of the vines for a period of 24-48 hours in late August and early September will drown the larvae. Water temperature and the amount of dissolved oxygen contained

within the water at the time of flooding can also influence larval mortality. Try to choose a period of time that will generally be cool, cloudy or even rainy versus sunny, warm weather to help protect the fruit from scald conditions. Experience has also shown that fruit that is still very green in color will break down more readily versus those with at least some red blush (and perhaps more wax layers) under flooded conditions.

- **Biological controls** such as the use of nematodes have also offered decent suppression of girdler larvae. Commercially available insect parasitic nematodes, though expensive, are effective in controlling girdler. Some growers routinely use nematodes each year more as a preventative measure at rates lower than the maximum recommended while others may use the maximum 3 billion/acre rate given severe larval pressure. Timing used for nematode applications should be the same as with Diazinon G-14/14G. Other biological controls such as spiders and ground beetles are naturally occurring and can aid in suppressing larval infestations although, the use of broad spectrum organophosphate insecticides can disrupt or hinder these beneficial populations.
- **Chemical controls** Diazinon G-14 or 14G granular insecticide is currently our only proven product labeled for the suppression of cranberry girdler. Granular applications of diazinon should primarily be applied only when you have had a history of a problem or where there's a current existing infestation and possibly the adjacent beds. Spot treat as warranted as broadcast applications on entire marsh acreage generally isn't necessary. Timing of applications

is made approximately 2-3 weeks following peak flight as first signs of girdler larvae appear, normally between July 21 and August 10. A degree-day model developed by the University of Wisconsin is also available to assist with the timing of this application. Be sure to have the current 24(c) label on hand and abide by all the directions and prohibitions outlined.

Most importantly, remember to contact the Department of Agriculture at least 24 hours prior to application, do not apply to any ditch, open water or within 10 feet of perimeter or center ditches, do not apply to bare ground, do not apply by aerial means, impound water for 7 days following the application and use only once per growing season. **Note:** The current 24(c) label is set to expire on cranberry in Wisconsin as of 12/31/2008 and renewal is unlikely at this time.

Tim Dittl, Agricultural Scientist - Ocean Spray Cranberries, Inc.

References

- Fitzpatrick, S. M., 2005 NACREW presentation and personal communication.
- Fitzpatrick, S. M., 2007, Survival of submerged larvae of cranberry girdler, *Chrysoteuchia topiaria*, in the laboratory. ScienceDirect, Crop Protection 26 (2007) 1810-1816.
- Mahr, D. L., 2005 Wisconsin Cranberry Crop Management Library CD.

One thing that becomes clear to the enlightened mind is that there are laws that keep life and living things in balance. Discovering the laws of physics and complying with them brings progress, enabling man to rise to higher levels of attainment than would otherwise be possible.

I believe that this premise also applies to ethical standards and moral values. It is, therefore, our responsibility to safeguard the home as a center of learning where these virtues can be instilled in an atmosphere of love and through the power of example.

Kenneth Johnson

FLASH BACK

At Cranberry School this past winter, Tim Dittl and I presented a handout entitled: "What else may be lurking in our cranberry beds!?"

At this time, I would like to refresh your mind on two of those pests. One the Cranberry Leafminer and the other is the Rose Chafer.

Cranberry leafminer larvae are light brown and legless measuring about 1/8" when full grown. Only one larva survives in most infested leaves even when multiple eggs are laid within a single leaf. When mining larvae meet, one normally kills the other. Larvae undergo five larval stages but feed only in the first four stages starting in May. In June, larvae begin to construct an elliptical case by sewing the upper and lower leaf surfaces together with silk except for an emergence slit. The oblong, elliptical cases where larvae pupate measure about 1/8" long. The pupal cases fall out of the leaf leaving an elliptical hole. Infested leaves eventually turn brown around the hole where feeding occurs then drop to the ground. Numerous leaves with single oblong holes in them and/or silken pupal cases may be picked up in the sweep net. Pupation occurs in mid-June to early July.

Moth flight is generally very short-lived. Moths begin to emerge in late June with peak flight occurring during full bloom, primarily the first two weeks in July. Adult moths measure about 1/8" in length and are sometimes found in baited sticky traps placed in the field (pictured above with *Sparganothis*). Severe infestations can cause significant leaf drop similar to "winter injury". Eggs are laid in July where they overwinter and spend most of their lives. Only one generation occurs per year in Wisconsin.

An adult **Rose Chafer** is a type of beetle measuring between 5/16" to almost 1/2" in length. It's described as being slender, plate-green to tan in color with reddish-brown to orangish long, spiny legs. It also has short, but noticeable lamellate (layered or page-like), segmented antennae. Adults begin to emerge from the ground in late May and early June. They prefer light, sandy soils to lay eggs. Adult beetles feed on plants for three to four weeks, generally until late June. Females mate, lay eggs in the soil, then die shortly afterwards.

Adult Rose Chafers are known to feed on flower blossoms and foliage of plants especially roses, peonies, grapes, fruit trees, raspberries as well as many other flowering plants. Adults damage the plants by skeletonizing the leaf tissue, typically in between the large veins.

In our observations this spring both of these pests have surfaced. I was shocked at just what the Cranberry Leafminer can do. In a short period of time the leafminer feeds on leaves and leaves behind some definite signs of its presence. It is the weirdest thing to see leaves with a circular to oval hole right through the leaf. On one marsh in Wood County we observed a huge area feed upon. Discoloration and leafless uprights in circular patterns was our 1st sign of trouble.

Rose Chafer: We have known of the rose chafers presence but not until this season could we honestly say that they are truly feeding in cranberry beds. We have observed them feeding on leaves and flowers. One specific area was heavily infested and you would be shocked to see the feeding that was going on. Special thanks to a dedicated conscientious grower, our eyes have been opened to just what this pest can do during the three weeks of flight. This pioneer from the Warrens area is willing to try Mass trapping the adult rose chafer. I witnessed the 45 minute trap counts of over 50 in one

single spot! Because this is so new to us, we will continue to search for a better understanding. Stay tuned as the saga continues in Cranberry Land.

It IS simply amazingWHAT ELSE IS LURKING OUT THERE?

Jayne Sojka, Lady Bug IPM, LLC

CRANBERRY FLEA BEETLE & REDHEADED FLEA BEETLE

Typically we start to see Cranberry Flea Beetle (Redheaded flea beetle) Adults the later part of July.

Things to look for are skeletonizing to the leaf – The leaves will turn brown wherever there is a larger population of beetles. We have observed some chewing on berries as well, but typically we see leaf damage first. Our economic thresholds vary depending upon weed pressure and if we observe any damage. Sometimes we sweep only 5 to 6 and see damage, then again we have swept 18 to 22 in a real weedy section of a bed and we saw no vine damage at all. One has to weigh all the pros and cons in treating these pests as they will continue right up until harvest or a frost night.

With the pesticides we have today it seems that we have more Flea beetle than 10 years ago. I have seen this pest become the #1 PEST for some growers here in Wisconsin Cranberry Land.

Dan Mahr wrote a very informative article for the Wisconsin Cranberry Crop Management Library which Teryl Roper has shared with each and every one of us in 2005. I will highlight just a few items to refresh your memories right now.

I quote Dan, "Cranberry flea beetle over winters in the egg stage in the soil. Eggs hatch in June and the larvae begin to feed

on the roots. They are found just below the trash layer down to 10". It is not known exactly when the pupal period occurs or how long it lasts, but the adults become active in July. The adults feed on cranberry foliage and the berries until mid-September. During this time, eggs are deposited in the soil where they will remain until the following year. There is only one generation of cranberry flea beetle per year"

Dan further explains what the larvae feed on, "The feed on the roots and underground runners of the cranberry. This can result in girdler roots and vine death if the infestations are severe. Damage is similar to that of Cranberry Girdler, but occurs earlier in the growing season. Damaged roots attempt to callous and also frequently send up weak upright growth; these symptoms are diagnostic for flea beetle but not for girdler. The adult is what we target in controlling this pest."

*Jayne and the Bug Patrol
Lady Bug IPM, LLC*

RETHINKING THE CORPORATION

(Excerpts by Forler Massnick)

- Science and technology are advancing so rapidly, that it tends to overwhelm businesses stuck in the rut of fear of change.
- Much of what passes for change today, is simply tinkering. When you get done tinkering with a jalopy, you still have a jalopy!
- There are obstacles standing in the way of business change. One of those, hard-wired into the make-up of humans, is defined as the "fear of change"!
- Fifteen percent of all the people who have lived on this earth are alive today. Fewer than five percent are in the United States. Is this "Business as usual?" I don't think so!

WSCGA SUMMER MEETING

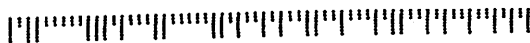
The 120th WSCGA Summer Meeting, Field day & Trade Show, are set for August 13, 2008 and hosted by the Wisconsin Cranberry Discovery Center, Warrens Cranberry Festival, and Spring Valley Cranberry LLC located in Warrens WI.

This annual event is often the highlight of the summer as production continues and harvest is yet a few weeks off! The event certainly has something for everyone. With the Tradeshow, growers and friends have the opportunity to see what's new in the industry and talk business with the many associate members of the association.

Marsh observations are part of the trip in to the grounds and growers are encouraged to see what's active at the host marsh, as well as attending the mini-clinics to learn what's new in technology. On site, the discovery center has much to offer as well as getting to know what cranberry products are new this year.

Completing the day, the WSCGA will hold the Annual Business Meeting starting at 1:15 p.m. You will have an opportunity to meet with your board and see what activities and programs are planned for the up-coming year. Growers are reminded to contact WSCGA for lunch arrangements as the deadline for that is August 1, 2008.

MIKE BRETEL
FARMLAND BIRON MARSH
120 COUNTY ROAD U
WISCONSIN RAPIDS WI 54494-8803



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Department of Horticulture
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