



**UMASS
EXTENSION**

Cranberry Station Newsletter

AUGUST 2007

UMASS CRANBERRY STATION

1 STATE BOG ROAD

P.O. BOX 569

EAST WAREHAM, MA 02538

<http://www.umass.edu/cranberry>

YELLOW VINES SHOWING UP AS A PROBLEM THIS SUMMER

It's that time of the year when the reports of yellow vine (YV) start to roll in. YV shows up as a yellowing along the leaf margins (edges) with the areas along the leaf veins remaining green. Usually the symptoms show up first in the old leaves and then move up the stem into the new growth. The most common time for the symptoms to become severe is around fruit set when demand for resources in the plants is high and dependence on sprinkler irrigation is greatest.

What causes YV? The YV symptoms are most likely due to nutritional imbalances in the cranberry plants. BUT fertilizer management is not the cause of the problem. Instead, we believe that the nutrient imbalance is secondary to root problems caused by stress. The stress involved is most often water stress (too much OR too little) but may also involve herbicide stress on some bogs. These stress conditions lead to poor root development. This past spring, many bogs stayed wet due to late ice out and frost protection. This can lead to shallow rooting. Casoron use can aggravate the problem.

We have previously visited bogs with patches of YV and have found that the soil water content in the YV areas is either much higher or much lower than that in the surrounding green areas. The consistent finding has been that the rooting depth in YV areas is shallower than that in unaffected areas. In drought conditions, common most years during July and August, uneven distribution of water occurs due to reliance on sprinkler irrigation and varying distance to the underlying water table. Put this together with the high nutrient demand during early fruit development and nutritional problems may be the result. Fertilizer tends to be washed away from the roots during irrigation and areas with poor

rooting may not be able to move enough minerals and water to meet the demands of both shoots and fruit. This sets up a competition for resources in which the developing fruit and the youngest leaves (at the top of the shoot) are the best competitors, leaving the older leaves showing symptoms of nutrient stress, in this case, YV.

Treating YV — short term fixes. YV plants are not doing well at taking in nutrients from the roots. For this reason, adding more fertilizer to the soil most likely will do little to arrest or reverse YV. Instead, foliar feeding should be considered. Providing nutrients through the leaves (bypassing the roots) can help to bring the plants back into nutritional balance. Based on tissue testing in YV bogs over a period of years, and based on field research and grower experiences, the most likely foliar feeds to be helpful are magnesium (Mg) and urea. These should be used separately. If you have had success with Mg in the past, try it first, otherwise try the urea first. Apply at dawn or dusk (preferred) as you would a pesticide (minimize wash-off). The aim is to have the plant stay wet for several hours after the material is applied so that it can penetrate into the leaves. Use urea at 2-4 lb/A (to give approximately 1-2 lb/A nitrogen). For Mg applications, use a commercial foliar feed (3% Mg) at 1-2 qt/A or apply up to 5 lb/A Epsom Salts (magnesium sulfate). Urea and Epsom Salts should be dissolved in water prior to application as a foliar feed.

Treating YV — long term solutions. In the long term, changes in water management may be needed. In most cases, YV appears in areas that were too wet early in the season. This leads to limited root development and these same areas are then the most

susceptible to YV and water stress later in the season. Rooting depth can be improved by keeping the bed well drained early in the season. This is particularly important in years with frequent frost nights requiring sprinkler operation or in years with heavy rainfall. When the water table is closer than about 6 inches below the surface, root development and root function is impaired.

A float device, designed by Bruce Lampinen, mounted in a perforated pipe (directions for constructing and installing these are available from the Station) is useful to monitor the depth to the water table and to minimize times when the water table is too close to the root zone. Water can move up from a water table at a depth of up to about 15 inches by the process of 'capillary rise'. With a water table below 15 inches, capillary rise may be unable to keep up with plant water demands, particularly at midday under stressful conditions (hot, dry, windy).

A tensiometer can also be used to monitor moisture in the root zone. A water table varying from 6 to 15 inches in depth (as recommended above) will result in tensiometer readings between 1.5 cbar (at 6" water table depth) to about 4 cbar (at 15" water table depth). Therefore, tensiometer readings can be used to assess water status and irrigation can be scheduled based on an early morning reading of the tensiometer. Morning readings:

0 - 1.5 cbar	soil is too wet
1.5 - 4.0 cbar	adequate water is available
4.0 - 7.0 cbar	adequate water for mild conditions, but if hot and/or dry conditions are forecast, irrigation should be applied
>8.0 cbar	irrigation is needed, regardless of weather conditions

Ideally, irrigation water should be applied as a combination of subirrigation (manipulation of the water table) and overhead sprinkler irrigation.

CAROLYN DeMORANVILLE

Carolyn DeMoranville, Director

ANNUAL PRUNING AND FERTILIZER APPLICATION

A SARE grower grant project was initiated in 2003 to study pruning, sanding, and fertilizer rates. Growers and researchers alike have asked, "Can mechanical pruning replace or reduce the need for sanding?" "Is the addition of fertilizer to pruned vines needed to maintain vine vigor and yield production?" This study aimed to determine if pruning could be an adequate substitution for the traditional practice of sanding on a whole-farm demonstration-style basis. The goal was to compare annual mechanical pruning, with and without fertilizer, to the traditional cultural practice of sanding. We wanted to see if annual pruning has any negative impacts on yield or general plant health and to evaluate interaction of pruning and various nitrogen management plans on cranberry productivity.

What we did. Six study beds were selected at one farm in Rochester (RCH- Howes) and one in South Carver (CVR- Early Black). The study was designed as a demonstration-style experiment and was not replicated. When data were collected, four subsamples (vines or fruit) were taken from each section. Six treatments were initially proposed:

- pruning + 0, 20, 40, or 60 lb/A nitrogen
- sanding + 30 lb/A nitrogen
- no pruning + 30 lb/A nitrogen

Both sites received annual pruning and nitrogen treatments as proposed. A motorized mechanical pruner with a 6-foot rotating head that was fitted with small, evenly spaced knives was used at both sites. Unfortunately, due to weather and other issues, (we tried but) we could not get the sanding done within the 4-year period of the grant. Although not intended as such, we ended up looking at our data in the context of annual pruning with various nitrogen rates (we had to eliminate the sanding treatment).

What we measured. The weight of prunings generated each spring was recorded. Upright samples (for vine density and biomass) were collected from RCH in 2003-2005 and from CVR in 2004-2005. The number of vegetative and flowering uprights and runners were separated into groups, counted, and weighed. Fruit were harvested in September of each year from each

treatment area and evaluated for fruit number and weight.

What we found out. The weight of vines collected from the spring pruning varied from 0.04 to 0.16 tons per acre; all N treatments yielded equivalent amounts of vines at each site in each year. Except for the occasional statistical difference, nitrogen rate plus pruning did not affect vine biomass or yield components, including flowering and vegetative upright density and biomass, runner biomass, total biomass, weight per berry, and marketable yield. All pruning treatments, even with high N rates added, had a loss of total biomass (which would be expected since they were pruned) compared to baseline data. Annual pruning with up to 60 lb N per acre did not adversely affect typical cranberry yield components. Since cranberries are biennial bearing, three years may not have been long enough to truly evaluate the impact of fertilizer rate and pruning.

Take-Home Message. The biggest take-home message from this study comes from the fact that during the 4 years of the study, we could not make an application of sand to either study site for a variety of reasons (weather, labor, other tasks, etc.). This underscores the importance of identifying alternatives (such as mechanical pruning) that will allow the interval between sand applications to be lengthened without incurring loss of vine vigor or production.

I am appreciative of SARE (Sustainable Agriculture Research and Education) for their funding and support of Project ONE03-013. Many thanks to the Gilmore Cranberry Company for donating their time, machinery, and property to the project. As an aside, there are seven data tables that go along with the data from this project and the report submitted to SARE. Any interested parties can contact me for a copy of these tables.

HILARY SANDLER

THE IPM CODE A PHONE MESSAGE
IN UP AND RUNNING
508-295-2212 EXT. 60
OR
WWW.UMASS.EDU/CRANBERRY

POLLINATION UPDATE

Whew! Pollination appeared strong this season. Many cranberry growers observed good activity and our Entomology Lab's quantitative surveys on 12 cranberry beds showed that honey bee and bumble bee numbers were surprisingly high. One beekeeper said that a good nectar flow added to bee activity.

Regarding honey bee services, anyone paying attention to the media is aware that large bee losses were attributed to 'Colony Collapse Disorder' (CCD), causing great concern for all of us. However, beekeepers were able to restock hives and some charged higher prices and invested in better feeding and hive conditions. Growers scrambled to assure hive availability. Now, USDA warns that beekeepers could still face a serious problem next year and beyond. On the positive side, a well-funded, long-term federal research push is ongoing by honey bee specialists. A 'Colony Collapse Disorder Action Plan' was issued in June by USDA. Several factors are probably at work causing CCD, the most likely are pathogens, parasites, chemicals (including pesticides), nutritional/environmental stress, and lack of genetic diversity. We need to keep an eye on the insecticide studies — some of the new cranberry compounds (Actara for cranberry weevil and Admire for soil grubs) are in the neonicotinoid class and may have sublethal effects on pollinators. For example, bees may survive exposure to these compounds but get lost after leaving the hive (learning and memory as well as other essential brain and motor functions could be impaired in the foraging worker bees).

For the future in cranberry, while honey bee researchers figure out the causes of CCD, the 2007 CCD alarm should prompt a 1) review of current cranberry best management practices during pollination, 2) a critical review of practices that may impact honey bee pollination services, and 3) establishment of guidelines for maintaining populations of native bees such as wild bumble bees.

ANNE AVERILL

AVAUNT LABELED FOR CRANBERRIES

Avaunt (indoxacarb) insecticide has finally received a full registration for use in cranberries. This news is most relevant for your Spring 2008 management plan. Avaunt is a super alternative to Lorsban and Diazinon for certain insect problems. Avaunt is highly effective against **cranberry weevil**, *BUT* only in spring (May) when used against the adult weevils that have overwintered. It is *NOT* labeled for use against the summer (July-August) population of cranberry weevil (currently emerging on some beds)—because it is not effective. It is labeled and works well for **black-headed fireworm** and **spanworms**; Avaunt also will hit **cutworms** such as **blossomworm** and **false armyworm** if they are present on the bed. It is not a good tool for cranberry fruitworm or Sparganothis fruitworm.

The application rate is 6 oz. per acre, with no more than 24 oz. applied per season. For weevil, no more than two applications can be made against the spring population. The worker re-entry interval (REI) is 12 hours, the pre-harvest interval is 30 days, no flow-through bogs can be treated, and water must be held for 1 day following application.

Avaunt has a novel mode of action and works in a specific manner against the proper functioning of the insect nerve. It must be ingested for greatest effectiveness, so coverage is key. It is toxic to pollinators exposed to direct treatment but is said to have a low impact on honeybees after the spray has dried.

ANNE AVERILL & MARTY SYLVIA

UMASS EXTENSION
UNIVERSITY OF MASSACHUSETTS
CRANBERRY STATION
P.O. BOX 569
EAST WAREHAM, MA 02538