January 2007

Cranberry Winter Workshop

Saint Lawrence Catholic Church, Raymond, Saturday 1:00 to 4:00 pm, March 10, 2007.
Three pesticide credits will be given. Topics include: Cranberry pest management research, new variety trials research, fruit keeping quality, new pesticides for 2007, surface water quality, BMP/EQIP implementation, first-aid for pesticide poisoning and pesticide application compliance problems.

The 2006 Crop

Speculations abound as to the causes of our below average crop. In all likelihood it was due to a series of "perfect storm" events rather than a single cause. Here are of my top four reasons, listed in what I think are least to most important. First, winter kill occurred on the very large buds during the cold temperatures we had last February. Based on the buds I examined, this was mostly on very large swollen buds of Pilgrims. Buds that were not killed outright could have had sub-lethal damage that resulted in reduced set. I suspect the production of nectar might have been impaired and thus reduced the attractiveness to bees during pollination. Many growers noted very poor bee visitation to beds in full bloom during the days when we did have good pollination weather. This later theory is speculative and difficult to prove.

Second, the cool spring temperatures delayed bud development and consequently bloom was several weeks late. This in turn, caused problems with pollination and fruit size. If you compare our growing degree days (GDD) for the spring of 2006 with previous years, it ranks as one of lowest in the past 20 years. We compared GDD using all sorts of combinations of months and the results were always the same, one of the lowest in recent history.

Third, pollination weather wasn't the greatest. We had no days with a high above 65 F in June in 2006. This is a common problem for us and is frequently blamed for poor crops. Normally, however, this mainly affects the more pollination-challenged varieties like McFarlin, while Pilgrims and Stevens are able to set a good crop with only a few good pollination days. I was only able to find out about a few Stevens beds in Washington that had respectable yields. These were young beds in their prime. Another problem related to pollination was that bees arrived too early, two to four weeks before full bloom. This is probably not a concern on most years, but was extreme this year and could have caused minor shifts in their foraging habits. We have data from our previous pollination studies that clearly indicate that colonies have very different pollen collection patterns. For example, some colonies on some farms will have most of their pollen coming from cranberries, while other colonies will have almost none. Bees are very intelligent in terms of energetics and aim to achieve the greatest return for the least amount of work. If they get conditioned to other resource-rich plants they are less likely to work on cranberries. In addition, it is not really ideal for a bee colony

primed for pollination to sit around for several weeks waiting for the weather to clear before foraging.

Lastly, our size was down this year. On beds that I have been tracking, average fruit size for the past 10 years (grams/fruit) was 25% smaller this year than previous averages. Small fruit size was more than just the result of late blooming flowers failing to size; even early bloom flowers had smaller than average size. Fruit size is mostly driven by photosynthate resources, and not fertilizer or other nutrients. When the photosynthetic process is hindered by low temperatures during the growing season, fruits are not going to be as big they would under ideal conditions. The weather during fruit growth time-period this year was poor. The number of days when we got above 65^{o} F for June, July, August and September were 0, 7, 0 and 13, respectively. Normally we range between 15 to 22 days/month above 65 for July, August and September, and between 5 and 10 for June.

What can be done to avoid this problem next year? Not too much, but here are some thoughts. On the bright side, because of crop cycling effects we can expect a larger than average crop next year. If a really serious cold snap hits us again and you have the capability to protect your Pilgrim beds by flooding, I would do so. Lastly, it would be beneficial to try to better synchronize bee hive arrival with full bloom.

Research Highlights from 2006

Callisto. We had numerous research projects on ways to improve efficacy and reduce crop damage. The effects of surfactants were too subtle to make general conclusions. Some were better than others, but not enough to warrant recommendations. We didn't see any problems from tank mixing with Select. The early timing of the first application was really important for perennial weed control. All of our silverleaf plots had 95% season-long control with two applications – one during first growth flush (April) and the second in June. As long as you are diligent on timing, I recommend switching from Casoron to Callisto for silverleaf management. After two years of treatments comparisons, the benefits in terms of both weed control and crop health are significant. I also liked the results we were seeing with ultra-low spray volume applications for the more difficult to control weeds, but it is too early to make recommendations.

Weevil and girdler control. We had several research plots out in 2006 for weevil and girdler control. None of our girdler treatment worked and there is still no silver bullet to kill weevils. Admire was still so-so as a larvicide. It required two applications – one mid-summer and one post-harvest to get the 75 to 80% control. Actara worked OK as an adulticide, but it took two applications for really good control. Timing of Actara is still problematic as it relates to application when the bees are out. Our best single weevil treatment was an August timing of a new nematode (Nemasys L - *Steinernema kraussei*). The nematodes are able to work at low soil temperatures (40^{o} F) and thus can be used either in the spring when larvae are active (March to early May), or in summer for new larvae (August to November). We don't have data, however, for a spring application on weevil, nor on how effective a summer application would be for girdler control.

Fruit rot control. We have two years of trials on early and mid-bloom fungicide application under our belts and I am not ready to make any recommendations yet. The good news is that, across the ten beds we worked on, early applications of fungicides (several types) never resulted in yield decline or smaller fruit size. Unfortunately, these last two years were not ideal for conducting research on fruit rot. The level of fruit rot was not high enough to allow for clear conclusions about treatment effects. Overall we see a slight decrease in fruit rot

from a mid-bloom spray but not enough to warrant an extra application.

Pest Management

Winter weed management. I still like Stinger for winter weed management. There is no risk to the crop and it does provide excellent control for suppression of false dandelions, lotus and clover. Because of their low ground profile now, it takes numerous trips across the beds to find and treat these weeds this time of the year. Winter Stinger will also suppress "sour grass" aka "sheep sorrel." I also like to clean up beds with grass herbicides like Select once you begin seeing activity in the early spring or late winter. Just for your information, Callisto can not be used until we have a Section 18.

Weevil. There is still time for winter Admire application for weevil larvae. On peat soil, this time of year expect approximately 50 to 75% control. You can also try Nemasys L nematode in April. Let me know if they work.

Sanding for girdler and weevil damage. Beds damaged by these pests can be helped out in their recovery by sanding the weak spots.

Miscellaneous

Pesticide news for 2007. Although not official, we should expect to receive a Section 18 for Callisto for next year. The package has already been submitted and I don't see any problems. We also have a new fungicide with a Section 3 registration - Indar. This fungicide is supposedly highly effective in reducing cottonball and fruit rot. Our research data from 2006 didn't clearly show it was better than our current fungicides, but good fruit rot data is difficult to obtain unless all the conditions are just right. I would encourage growers to start getting experience using Indar. It will be a great fungicide to have in the toolbox.

Vine purity. Dr. Nahla Bassil, a molecular geneticist from USDA/OSU in Corvallis has done some interesting work on cranberries. She is about one year away from being able to provide growers a service on identifying vines for their potential productivity or lack thereof.

Protect liquid pesticides from freezing. Some pesticides (particularly liquid formulations) will break down or separate, making mixing difficult or impossible if allowed to freeze. If you can, it is a good idea to separate these products out and provide enough heat to prevent freezing.

Weather. We finally have our weather station fully functional. If you have not used it yet, you should try accessing the WSU Long Beach Research and Extension Unit Weather Station. Go to http://agweathernet.com. The user name is cranberries and the password is wsulongbeach. Find Pacific County and check our box. There is a wealth of data there.

Research plans for 2007. I am already licking my chops waiting for next season. It should turn out to be a pivotal research year for several reasons. There are several new OP replacement chemistries that should work well with chemigation application methods for most of our insect pests. I am in desperate need of research sites for tipworm, fireworm, girdler and weevil. Grower compensation will be available. Please give me a call if you have a site with a lot of activity. I feel really confident we are really close to an easy fix on lily. Our fruit rot experiments should really start to separate out treatment differences. Lastly the 2003 variety trials planting will be in full production and differences should really begin to show.

Need lots more pesticide credits? WSU Long Beach is having a Burrowing Shrimp Control Workshop on January 18th and 19th that should be worth 6 to 8 hours worth of credit. You are welcome to attend. Let me know if you need more information. The hours will be from 1 to 5 p.m. January 18th and 8 a.m. to 3 p.m. on January 19th.