Integrated Cranberry Crop Management for Wisconsin

Cranberry Crop Management Newsletter

Volume XX
Number 4
June 20, 2007

Contents:

More on Callisto 1
A Hot Topic 3
Resistance to Pesticides 4
Roundup Reminders 6

MORE ON CALLISTO® HERBICIDE

Based on questions asked at the recent Pest Management Update Meetings we offer these responses to common questions:

Where can I find information about Callisto application?
Before applying Callisto herbicide you should read and follow both the full package label and the Section 18 emergency exemption for Wisconsin.

Can I spray my entire marsh with Callisto?
Callisto is registered ONLY for the control of four weed species: Buttercup, Marsh St. Johnswort, Violet, and Birdsfoot trefoil. **IF AT LEAST ONE OF THESE WEEDS IS NOT PRESENT IN A BED IT CANNOT LEGALLY BE TREATED WITH CALLISTO.** The full Section 3 label will not have this limitation, but for this season the limitation applies.

What is the proper timing for Callisto Application?
The label allows application after bud break but before fruit set. The exact timing of both of these events is slightly different for each year and varies geographically. Fruit set would be when 2-3 pinheads are formed on most uprights.

The label requires a 45 day pre-harvest interval. Can I spray up to the 45 day pre-harvest interval even after fruit set?
No. The label only allows application after bud break but before fruit set. This seems contradictory, but the manufacturer has made it clear that the application window is between bud break and fruit set.

Experience suggests that crop oil can damage flowers. Do I have to include crop oil concentrate in my sprays during flowering?
No. The crop oil concentrate is a recommendation from the manufacturer, not a requirement. For post-emergent control of weeds research shows that better control is achieved when a sticker/spreader is included in the spray mix. In research trials, no differences in product performance were observed when Callisto was applied with crop oil concentrate compared to Callisto applied with non-ionic surfactant at 0.25% v/v surfactant rate. Previ-

ous grower experiences with adjuvants suggest that non-ionic surfactant may in some cases be less damaging to flowers.

Do I need to be concerned about spraying bees that are working on the marsh during bloom?
There is no evidence that Callisto is toxic to bees or other pollinators.

Can I use Callisto as a wiper application?
No. Callisto is not registered for use in a wiper application. Any drips or drops would be readily apparent on the vines.

Can I spray Callisto on newly planted beds later than fruit set on bearing beds?
Yes. On non-bearing beds Callisto can be applied up to 45 days prior to applying a fall or winter flood.

What rates should I use?
The maximum application rate is 8 oz/a per application. In research trials, rates ranged from 4 to 8 oz/a per application. Young weeds are controlled with lower application rates than older weeds. Preemergent application to new plantings is effective at the lower rate.

As long as I don't exceed the allowable 16 oz/a/season rate, can I make 3 or 4 applications per season?
No. Only two applications per season are allowed and these must be at least 14 days apart.

Will I get better activity if I mow off weeds prior to application?
No. Callisto is absorbed through the leaves of weeds. If most of the leaf area is removed prior to application the opportunity for absorption is also reduced.

When applying Callisto with a backpack sprayer should I spray to runoff?
No. If you have applied that much herbicide you will have exceeded the labeled rate on a per acre basis. Calibrate your backpack sprayer and only spray to lightly cover the foliage per the calibration.

The emergency exemption requires a 10 foot buffer strip between application and surface waters. Does this mean I cannot spray the outer 10 feet of each bed or along internal drainage ditches?
No. Conversations between WSCGA and WDATCP clarify that internal bed perimeter ditches are not considered surface waters. However, it is advisable to draw the water down in these ditches prior to application and then allow them to fill up again.

Will Callisto application affect the marketability of my crop for the export market?
We don't know. You'll have to make that inquiry of your handler.

Will I have to report my Callisto use?
Yes. Since this is a Section 18 emergency exemption and not a full label we are required to report Callisto use. Forms for reporting use will be sent to growers later this summer after fruit set.

Teryl Roper and Jed Colquhoun, UW-Madison, Dept. of Horticulture

---

Oh, the comfort, the inexpressible comfort, of feeling safe with a person, having neither to weigh thoughts, nor measure words—but pouring them all right out—just as they are—chaff and grain together--certain that a faithful hand will take and sift them—keep what is worth keeping—and with the breath of kindness blow the rest away.

Dinah Maria Mulock

A HOT TOPIC

One of the pleasant parts of farm work is the opportunity to work outside in beautiful surroundings. However, this opportunity comes with a concomitant risk. Government studies in western and southeastern states document a number of farm worker illnesses and deaths related to heat. Some of these states have implemented regulations requiring employers to provide water, shade, and rest periods to avoid heat related illnesses. Wisconsin has not yet enacted such legislation. However, it is good business to protect you and your employees from heat related problems.

Heat related illnesses begin when the body cannot dissipate heat as quickly as it is generated. About ¾ of the energy used when working is converted to heat, not motion and more strenuous activity generates more heat. The body has mechanisms to dissipate this heat. The first is vasodilation. When the body is hot capillaries near the skin open up to allow more blood to flow thus allowing heat to dissipate. The second is perspiration. As water is released from the body to the air the water evaporates leading to a reduction in body temperature. When vasodilation and sweating are still insufficient to cool the body heat related illness follows.

In our climate the hottest days are also frequently humid as well. High humidity reduces the effectiveness of sweating. Wind improves the body's ability to remove heat because it breaks up the natural boundary layer. Heat index shows the relationship between actual air temperature and humidity. A complete heat index chart is available here:
http://www.crh.noaa.gov/dvn/tools/heatindex.pdf

Heat exhaustion is characterized by moist clammy skin with a normal temperature. Heat exhaustion is treated by getting person in shade or a cool location and drinking ample amounts of water.

Heat stroke is characterized by dry, hot skin, high body temperature and confusion. Get the person to a cool shady location and spray them with water. Call a doctor promptly.

Prevention is the solution to heat related illnesses. Here are some things you can do to prevent heat related illnesses:

- Schedule the most strenuous physical work early in the day when temperatures should be coolest.
- Pay special attention to new workers since they typically won't be acclimated to working in hot conditions. 80% of heat illnesses occur within the first four days of employment.
- Have cold water readily accessible at all times. Provide one quart of water per person per hour. Drinking only when thirsty won't replenish water lost through sweating when you are working hard.
- Have a buddy system so that workers look out for one another.
- Teach workers the symptoms of heat related illnesses and how to respond to them.
- Wear loose fitting light colored clothing to assist the body in dissipating heat.

Preventing heat illness, like all other avoidable health problems, is simply good business. Protecting workers' health will pay off in the long-run with fewer lost days and overall better health.

Teryl Roper, UW-Madison Extension Horticulturist

The past is to learn from and not to live in.

Richard L. Evans

RESISTANCE TO PESTICIDES

Pesticide resistance is the inherited ability of a pest to tolerate the toxic effects of a particular pesticide. As resistance becomes more widespread in a population, you have to apply more pesticide more often to control the pest. Over time that pest may not be controlled with applications of that particular pesticide. Once that happens, that pesticide is no longer a useful tool. Hundreds of pest species, mostly insects, have become resistant to one or more pesticides.

Where does pesticide resistance come from? When organisms reproduce, the offspring receive copies of the parent genetic material. However, the copies are not always perfect. Mistakes appear. These are called mutations. Many times the mistakes are of no consequence or are lethal. Sometimes, however, a mutation benefits an organism. An example is a mutation that confers pesticide resistance. Because pest populations are large, it is likely that within a population there will be a small percentage that are resistant to a particular pesticide along with a small percentage that are extremely susceptible. Resistant individuals survive pesticide applications and are able to pass along this resistance to at least a portion of their offspring. Because the pesticide kills most of the non-resistant individuals, the resistant individuals begin to make up a larger percentage of the surviving population. As this continues, eventually most of the population is resistant.

In many cases, pest populations that become resistant to one pesticide in a group also become resistant to other related pesticides. This is called cross-resistance. Cross-resistance happens because closely related pesticides kill pests in the same way; (all organophosphates inhibit cholinesterase) if a pest can resist the toxic action of one pesticide, it can usually resist other pesticides that act in the same manner.

Given that pesticide resistance is an ever present threat, you need to understand what influences its development. In this way you can manage pests to minimize the chances for resistance to develop. The most important factors that influence the development of resistance are:

- The frequency of resistance in the pest population before using the pesticide of interest. Resistance may be entirely absent from a pest population, or it may be present in relatively few individuals. Obviously, no resistance is best.
- The chemical diversity of the pesticides used. If you always use the same pesticide or the same group or family of pesticides you won't be killing pests that are resistant to that pesticide or family of pesticide. When this happens the proportion of resistant individuals will increase more rapidly in the population.
- Persistence and frequency of use of a given pesticide. Resistance is more likely to develop against pesticides that have greater persistence ad that you apply often during a treatment season. These factors are less important for herbicides than for insecticides and fungicides. Even short lived herbicides can provide season-long weed control, and normally you apply the same herbicide only once per season.
- The proportion of the population exposed to the pesticide. Insect life cycles are generally very predictable, and you usually apply a pesticide when most of the insects are at the same susceptible stage. Thus, most non-resistant individuals are killed, which increases the

proportion of resistant individuals in the surviving population. On the other hand, insects that migrate in from non-treated areas dilute this population.

- The length of the pest's life cycle. As with any other inherited trait, pesticide resistance will increase more rapidly if the pest has a short life cycle and many generation in a single season. This largely explains why; insect populations become resistant faster than weed populations.

In the past we responded to resistance by switching to different chemistry. New products became available regularly. Unfortunately, this is no longer the case. Today's new pesticides are more complex, difficult to synthesize and more expensive to develop and use. Even these products are subject to development of resistance. Obviously, switching products is no longer enough.

In developing your pest management program you should assume that pests can (and will) develop resistance to any pesticide you use against them. This means placing greater emphasis on resistance management. This may be more work in the short run, but will pay dividends in the long run as effective chemistry can be maintained.

Resistance management includes reducing frequency of application of any material, utilizing non chemical approaches (BT's, nematodes), and population monitoring. This is part of the "integration" of integrated pest management.

Adapted from: Pest management principles for the commercial applicator: Fruit Crops, 3rd edition. UWEX, Madison.

If I am not happy with me, other people suffer.

Neal A. Maxwell

When There's Love at Home

There is beauty all around
When there's love at home;
There is joy in every sound
When there's love at home.
Peace and plenty here abide,
Smiling sweet on every side.
Time doth softly sweetly glide
When there's love at home.

In the cottage there is joy
When there's love at home;
Hate and envy ne'er annoy
When there's love at home.
Roses bloom beneath our feet;
All the earth's a garden sweet,
Making life a bliss complete
When there's love at home.

Kindly heaven smiles above
When there's love at home;
All the world is filled with love
When there's love at home.
Sweeter sings the brooklet by;
Brighter beams the azure sky;
Oh, there's One who smiles on high
When there's love at home.

Author Unknown

CRANBERRY FIELD DAY

The 2007 Wisconsin Cranberry Field Day will be held at Copper River Cranberry Company west of Merrill on Wednesday August 8. In addition to commercial exhibits and an opportunity to network with other growers, we'll have the opportunity to review research plots, to see tailwater recovery systems, and observe herbicide trial plots at the marsh.

Our hosts, marsh owners Ed and Rena Sabey and Tim and Deb Burton, invite all growers to come view their marsh and to enjoy a day together.

ROUNDUP REMINDERS

With cranberries in full bloom and fruit setting growers will once again be thinking about wiping weeds with Roundup. Be sure to read the product label before you begin an application. A few points warrant reminders:

- The label is the law. Read the label and have employees who will be applying Roundup read the label.
- Wear appropriate PPE. This includes a long sleeved shirt and long pants and shoes plus socks. Wat gloves are not required, but dent.
- Coverage is the most important variable. You must have good coverage of the weed's leaf surface in order to get enough material throughout the plant to kill it completely. Dyes added to the wiping solution help you tell where you have wiped. Add dye per the package instructions.
- Increasing concentration does not make Roundup more effective. Concentrations that are too high may be detrimental as they can kill the contacted tissue before enough is translocated to kill the roots. A 10 to 20% Roundup solution works for most people. Even a 5% solution may be sufficient. This is a case where less is more. I am sure that the lack of control some growers experience is a result of using too much herbicide, not too little.
- Cut stump applications are allowed for woody brush. Cut the plant off then treat the stump with a Roundup solution. Making an emulsion with lanolin and then applying to the stump will help keep the Roundup on the surface so it is absorbed for a longer period of time.
- Adding ammonium sulfate per the label specifications can help entry of the active ingredient and will improve performance.
- Regular Roundup requires a 6 hour rainfree period following application to get into the plant. Don't apply if rain is imminent.
- Remember the 30 day PHI.
- Keep the wiper surface clean. If dirt, weeds or other debris covers the wiper too little solution will accumulate on weed leaves.

Teryl Roper, UW-Madison Extension Horticulturist

WISCONSIN RAPIDS WI 54494-8803
120 COUNTY ROAD I
FARMLAND BIRON MARSH
MIKE BRETL
*****AUTO**MIXED AADC 530 3

Wisconsin Cranberry Crop Management Newsletter
Department of Horticulture
1575 Linden Drive
Madison, WI 53706

Nonprofit Org.
U.S. Postage
PAID
Madison, WI
Permit No. 658