CALLISTO USE IN MASSACHUSETTS, 2008: RESULTS OF A GROWER SURVEY

UMass Cranberry Station, East Wareham, MA 02538

A survey was mailed out to 350 MA cranberry growers in November 2008 to gather your experiences and opinions about the use of Callisto for weed management. 133 growers returned their surveys (38% response rate) and 66% of the survey respondents used Callisto in 2008. Applications were made by backpack sprayers (60%), boom sprayers (21%) hand-held sprayers (17%), and mist blowers (1%).

We asked about weed management with Callisto 1) on new plantings; 2) for specific or general weed control; and 3) for dodder management. We asked for rates used, target species and dates of application and how your experiences in 2008 would affect your use of Callisto in 2009. We also asked general demographic and outreach questions.

Callisto use on new plantings. Twenty-five growers reported using Callisto on new plantings, which included the varieties: Stevens (N=17), Ben Lear (N=4), Howes, Mullica Queen, Crimson Queen (N=3), Early Black (N=2), and Grygleski (N=1). At the time of application, most vines were less than 3 months old (N=15), with two and six reports of vines between 4-6 months and 1-3 yrs, respectively. 64% used 4 oz/A; 16% used 6 oz/A and 20% used 8 oz/A. Growers reported one treatment that started in May, four treatments started in June, 13 started in July and six started in August. Many new plantings (60%) also received applications of Devrinol; about 20% were treated with Roundup or Poast. Three-quarters of the growers rated weed control as good to excellent; no growers reported poor control. In general, control with earlier applications was rated higher than control with applications made in late July or August.

Reports on control were mixed. Growers expressed mixed views on the weeds that Callisto controlled on new plantings. Grasses, clover, cinquefoil, crabgrass, narrowleaved goldenrod (NLGR), dodder, and nutsedge were reported as controlled by half of the growers. The other half listed all of these weeds as <u>not</u> being controlled on the new plantings. In addition, you also mentioned no control of maples and sedges. Injury to cranberry was only reported by four growers (three instances on Stevens and once on Ben Lear); the symptoms were very minor and the vines grew out of the injury.

Dodder control with Callisto. 36 growers reported targeting 313 acres for dodder control with Callisto, with treated areas ranging in size from 0.25 to 50 acres. Treated infestations were characterized as patchy (42%), moderate (35%), or widespread (20%). 70% of the responders made two applications to control dodder. For the first application date, about half were applied in June, about half in July, and a few were made in August. The second application was typically made 3-4 weeks later except for the applications that started in August; these growers used a 2-week interval (the minimum required). The 4 oz/A rate was used most often (60%), followed by the 8 oz/A rate (18%) and the 6 oz/A rate (11%).

Control was variable and reported to be good to excellent (29%), moderate (50%) or poor (21%). Most who reported good to excellent control made only one application

and applied it before the end of June (but one application made as late as mid-August gave good results). You commented that dodder stems turned white, but seemed to recover. 40% observed a reduction in seed production (an important management criteria), but 25% were not sure if seed production was affected, either positively or negatively. When questioned about the appearance of the seed, 28% reported that the seed looked dead, injured, or weak; 11% said the seed looked healthy, and nearly half could not provide information on the seed appearance. 78% indicated that Callisto would be used for dodder management in 2009. You planned to use Callisto in higher rates and/or more applications and would make applications earlier in the year.

General weed control. When asked which weeds you were targeting (in general) with Callisto, NLGR, dodder and poison ivy were mentioned most often (Table 1). Dewberry, yellow loosestrife and nutsedge were also primary targets. Less frequently listed as targeted were asters, sawbrier, and rushes; grasses, clover, chokeberry, hardhack, wild bean and sedges.

When reporting on weed control of a mixed stand of weeds, 110 acres of patchy (42%), moderate (38%) and widespread (20%) infestations were treated using 4 oz/A rate of Callisto, applied in July by backpack sprayer (proportions very similar to those mentioned above). Almost half (45%) reported moderate control; 29% reported good to excellent control and 18% said control was poor. Again, most of you (88%) said you would treat earlier with more material and/or multiple applications in 2009.

Results on specific weeds. When you provided information on specific weeds, Callisto rates, timings, and application methods were similar as mentioned above. Cinquefoil was well controlled by two 4 oz/A Callisto applications as was nutsedge, wild bean, NLGR, false barnyard grass, and cutgrass. The first application in most of these reports was made mid-June. Two growers reported excellent control of fall panicum (corngrass) with 2 applications of 6 oz/A in late July (backpack) or one application of 4 oz/A in early August (mist blower). Two growers reported excellent control of dewberry when they used two applications of 8 oz/A. Four growers reported poor control of dewberry with Callisto but only one application was made or low rates were used. Moderate to good control of clover was reported with one or two 4 oz/A backpack applications, starting in early August.

Table 1. Number of MA cranberry growers who identified various weed species that they were targeting for control with Callisto in 2008.

Weed	Number
NLGR	54
dodder	54
poison ivy	52
dewberry	47
nutsedge	42
yellow loosestrife	42
asters	36
sawbrier	34
rushes	31
cutgrass	30
cinquefoil	29
clover	27
other grasses	27
chokeberry	21
panicgrass	18
other sedges	17
hardhack	15
Joe Pye weed	13

Control of asters was better when treated twice with 4 or 6 oz/A (starting in mid-June) but several growers reported only moderate control. Control of yellow loosestrife was very variable, but mostly moderate to poor.

The best control was reported when treatments were started in early-mid June. Control of poison ivy was variable but was best when treated twice with 8 oz/A, with treatment (backpack) starting by mid-June. Two reports were made of moderate control of sawbrier with two backpack applications of 4 oz/A, starting mid-June.

Single reports on specific weeds. One report each of the following was given (all by backpack unless otherwise noted): excellent control of pussy willow (no details provided), red maple with two applications of 4 oz/A starting in early August, and white violets with two ground rig applications of 6 oz/A starting in mid-June; good control of rushes with one application of 8 oz/A made in early July, pitchfork with one ground rig application of 6 oz/A made in mid-June, chokeberry with one application of 4 oz/A made in mid-June.

Other comments and observations. *Nitrogen fixers act as green manure*. Overgrowth of cranberry vines in an established bed was associated with the control of clover with Callisto. The grower had side-by-side treated and untreated areas for observation. It was concluded that the clover killed by Callisto acted as a green manure, released readily available nitrogen, and caused excessive runner production in the treated area. The excess vegetative growth occurred at the expense of fruit production and almost complete yield losses occurred in the treated areas. Growers should bear this in mind when controlling nitrogen-fixing weeds such as clover and wild bean.

Dodder control better on affected weeds. A comment made during a roundtable discussion in December 2008 was that dodder control was better (e.g., less seed production) when the dodder was attached to weed hosts that were affected by Callisto. Dodder seemed to be less affected by the herbicide application when it was using cranberry as a host. This makes sense since the herbicide would be present in affected weed species and since the parasite is absorbing compounds from the xylem and phloem of the host, it would uptake the herbicide. Cranberry is not affected by Callisto and dodder that is attached to cranberry is probably not absorbing active herbicide.

Chemigation. Many growers commented that having the ability to chemigate would help their dodder and general weed management. A Special Local Needs label was granted for Massachusetts in April 2009 permitting the application of Callisto through the irrigation system.

General demographic, computer use, and outreach information. Similar to other surveys, our data indicated that in general, cranberry growers in MA were late middle-aged (77% were 50 years or older), had a lot of farming experience (60% had 20-50 years of experience; 25% had 10-20 years), owned fairly small farms (half owned 12 acres or less; 80% owned 25 acres or less), and produced cranberries using conventional production practices. The responders represented about 5,300 acres of cranberry in MA. Most (93%) of the acreage was grown with conventional practices; 280 acres (8 growers) were in transition to organic farming and 76 acres (7 growers) were currently being farmed as organic. We also asked you to rate the importance of various outreach sources for obtaining weed management information. These results are summarized in Table 2.

Two-thirds of you reported having a computer at home and 27% had a computer at work. 18% of growers did not own a computer in 2008 compared to 24% in 2005. 71 growers used computers for e-mail, 59 visited the UMass Cranberry Station web site, 47 did word processing, and 36 and 30 used computers for recording farm expenses and pesticide applications, respectively. Very few (<12) used the computer to calculate spray rates or to submit forms to state agencies.

Conclusions. Based on the results of this initial year of use and grower feedback, Callisto will be an important weed management tool for cranberry growers. The herbicide can be applied by chemigation in MA (via 24c) or by other ground applicators. Reported weed control was variable for many weed species, so future efforts should focus on defining timing, rates, and weed growth stage to fine-tune management recommendations. Callisto should be an excellent option for weed management on newly planted vines; management may be improved when used in conjunction with other herbicides. Weed control seems to be best when weeds are treated early; established weeds, such as dewberry, may likely require repeated annual treatments of two applications to obtain adequate control.

Table 2. Relative importance of various information sources for MA cranberry growers to obtain weed management information. Numbers of responses are in parenthesis after the source.

	Responses (%)		
Source	**Very**	**Somewhat**	**Not**
Update meeting (81)	80	16	4
Bogside workshops (67)	45	34	21
Chart book (88)	91	8	1
Newsletter (88)	77	20	1
Web site (70)	30	44	26
Weed specialist (79)	73	20	6
IPM message web (64)	25	36	38
IPM message phone (67)	24	37	37
Grower organizations (65)	23	46	29
Other growers (78)	40	53	6
Internet (55)	11	38	47

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May 2009