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2005 Grower Survey: Obstacles to Dodder Control

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**Management practices and obstacles for control of dodder in commercial cranberry
in Southeastern Massachusetts-A 2005 grower survey.**

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Dodder (*Cuscuta gronovii*) is a shoot parasite of many plants including commercial cranberry. Dodder can twine around its host and embed specialized structures into the stem and withdraw water and nutrients. It is a destructive pest and can cause yield losses as high as 80 to 100% in cranberry. To successfully manage this pest, growers must use an integrated approach. Preemergence herbicides are typically employed to control dodder in the early spring and nonchemical options are used to manage any escapes. Prior to this survey, we could not quantify the extent of the use of integrated approaches to control dodder. The objectives of the survey were to assess the usefulness of various practices and define what growers saw as significant influences and obstacles for managing dodder.

A 25-question survey was mailed out during the week of March 21, 2005 and a follow-up mailing was sent out during the week of April 11, 2005. To maximize our chances to reach the appropriate audience, we engaged the assistance of National Agricultural Statistics Service (NASS) for distribution of the survey. A total of 432 surveys were mailed out to cranberry growers in Southeastern Massachusetts. Approximately 49% (210) of the surveys were returned and included in the tabulation.



Infestation of MA commercial cranberry farm edges by swamp dodder.

Growers were asked to circle appropriate responses, fill in blanks, rank factors in order of importance or to describe various herbicide uses. Completion rate of questions using the first three answer options was quite high. However, the completion rate for questions asking growers to explain, in written form, herbicide use patterns was not as successful. When data are presented as response percentages, the number of respondents (N) is noted either in the text or in the figure. Readers should be aware that questions involving descriptions of preemergence herbicide use rates and use patterns may have had lower response rates compared to other questions.

General Demographics and Computer Use.

The majority of cranberry growers were at least 50 years of age; 38% were between 50-59 years old and 34% were more than 60 years old (N=208). Only 4% were in the 30-39 age bracket. Fifty-five percent of the respondents were full-time growers (N=206); 59% had between 20-50 years work experience and 24% had between 10-20 years of work experience. Approximately 10,440 acres of production were owned, managed or leased (~72% of the total commercial acreage in Massachusetts) by 204 respondents, with 312 acres in transition to organic production and 70 acres currently in organic production. Three-quarters of respondents reported that all of their acreage was 3 years old or more; only 9% reported all of their acreage as being less than 1 year old. Almost 40% reported that none of their acreage was new plantings.

Approximately three-quarters of the respondents owned a computer, though primary use was divided between home use only (34%) and those who used the computer for home and business (39%); 23% of the respondents did not own a computer. Growers were asked to select from a list of activities for which they used the computer. Permitted to select more than one response, 114 growers used computers for email, 108 respondents said they used computers for the web and 85 selected word processing. Fewer reported using the computer for farm activities (61) or pesticide record keeping (53).

Status of Dodder in the Industry.

Almost half of respondents said dodder was at least a moderate problem for them; 12% classified it as a severe problem and 9% reported that dodder was not a problem (N=207). The amount of acreage consistently infested with dodder varied widely (Figure 1). Twenty-six percent of respondents said <5% of their acreage was infested while 12% reported that 75% or more was typically infested. Older farms were more likely to have dodder infestations than farms less than 6 years old (92% vs. 8%; N=192).

Figure 1. Percentage of MA cranberry acreage reported to be typically infested with dodder (N=198).

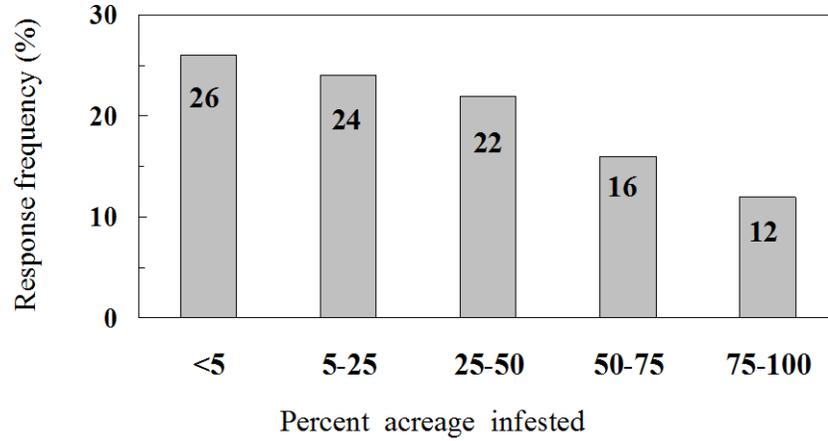


Figure 2. Number of MA cranberry growers who used various practices to manage dodder.

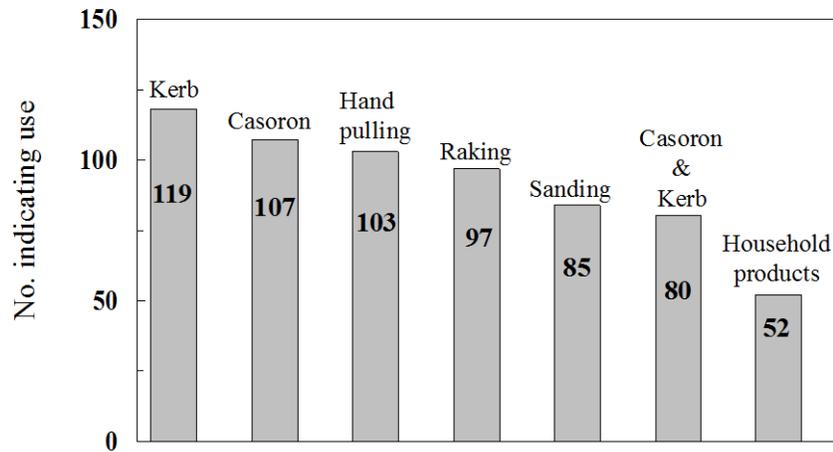
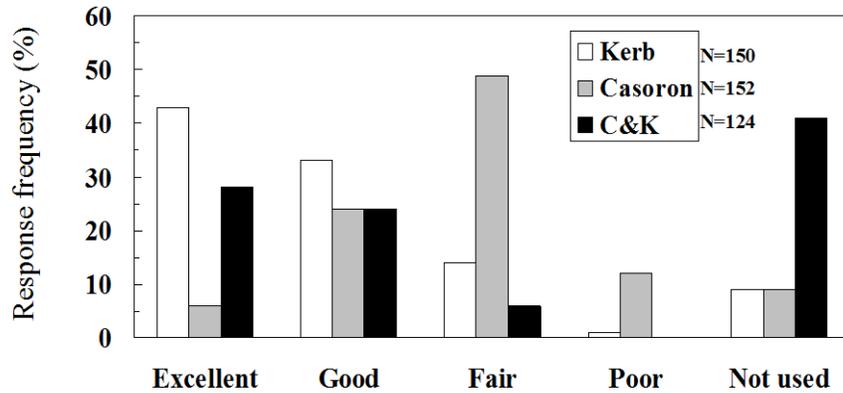


Figure 3. Ratings of three herbicide options used by MA cranberry growers to control dodder.



Herbicide Options to Manage Dodder.

Casoron (dichlobenil), Kerb (pronamide), and sequential applications of Casoron and Kerb were the herbicide choices that growers were asked to evaluate (Figures 2 and 3). The use of Kerb is currently available only through the granting of annual emergency exemption permits (Section 18). Seventy-six percent said Kerb gave good (33%) to excellent (43%) control, while control with Casoron was mostly rated as fair (49%) or good (24%). Kerb was less expensive to use (76% spent \$75/acre or less, N=113) when compared to Casoron (40% spent \$75-125/acre and 30% spent \$125-200/acre, N=104). Fifty-three percent (N=73) used one application of Kerb at 1 lb/acre; 27% used 1.5 lb/acre (maximum label rate) and only 4% used the reduced rate of 0.75 lb/acre. Use rates for Casoron were equally distributed among the 30-40, 40-50 and 50-60 lb/acre categories (~26% each; N=35); 5 growers from this small group reported using less than 30 lb/acre. Fifty-two percent reported good to excellent control with a combination of these two herbicides (N=124).

Non-chemical Control Options for Dodder.

Nonchemical options are used primarily as postemergence treatments and include removal of dodder mats with a hand-held rake, manually removing dodder and infected hosts by hand, application of a 0.5-1 inch sand layer on the vines during the dormant season (thus, preemergence use), and the use of spot sprays of diluted solutions of household products such as soap or vinegar (Figure 2).

Figure 4. Rating of several nonchemical options for controlling dodder by MA cranberry growers.

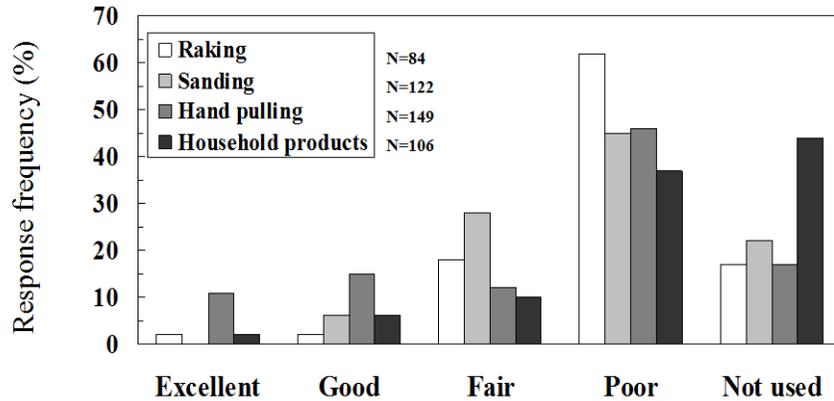
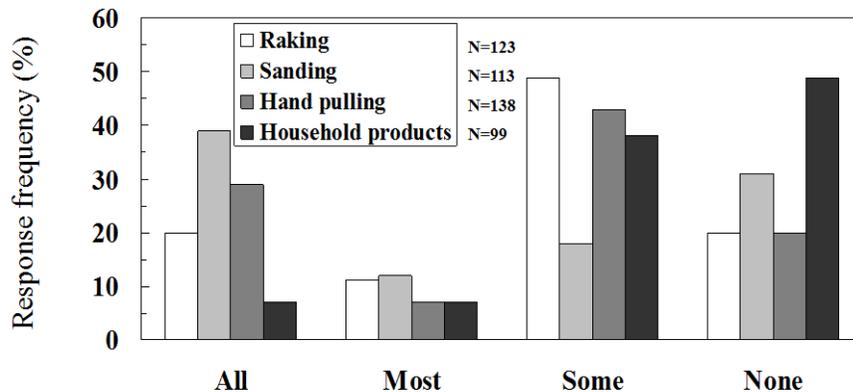


Figure 5. Portions of MA commercial cranberry acreage treated with various nonchemical options for dodder control.



Many growers (62%) felt raking gave poor control, approximately 45% felt hand-pulling and sanding gave poor control, and 37% had poor control with household products such as soap or vinegar solutions (Figure 4). Despite the acknowledgement of fair to poor performance, 31% did raking on most or all of their acreage, 36% did hand-pulling on most or all of their acreage (Figure 5). Fifty-one percent said they applied sand on most or all of their acreage, however it is likely that this practice was done mostly for other horticultural reasons, such as anchoring runners

and burying fallen leaves. Household products, while inexpensive, were only used by 38% on some of their acreage (N=99).

Cost estimates for raking and hand pulling were either quite low or quite high (that is, 30% and 33% reported costs <\$40/acre, respectively, and 26% and 30% reported cost >\$200 per acre, respectively) with the remainder relatively equally distributed among the 3 middle categories (\$40-75, \$75-125, \$125-200/acre). The variation in costs was likely due to whether growers did the tasks themselves or hired expensive manual labor.

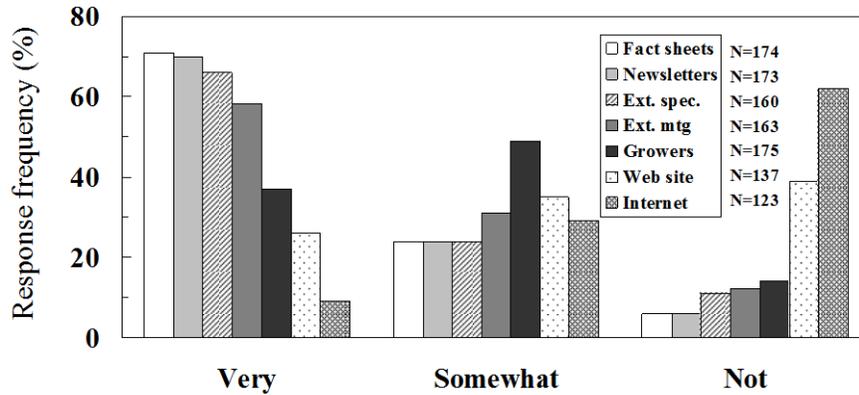
Flooding to Manage Dodder.

The use of short spring floods is a new nonchemical dodder management technique whose effectiveness is currently being evaluated by the author and several growers. Only 15% of the growers surveyed said that they had used flooding for dodder control (N=198). Of the 27 growers who have tried flooding, the number of hours the floods were held ranged from <11 hours to 1 week. Most growers felt flooding gave fair (11 responses) to poor (10 responses) dodder control. The cost of flooding was less than \$40/acre (11 growers) and 11 reported spending between \$40-75/acre; notably however, 5 growers said they spent \$125-200/acre.

Information Sources for Dodder Management.

Fact sheets, newsletters, and weed specialist advice (Extension sources) were cited by approximately 70% of respondents as being very important resources for obtaining information about dodder management (Figure 6). Getting information from other growers was very important for 37% of the respondents. The UMass Cranberry Station web site was very important for 26% and the internet was very important for only 9%.

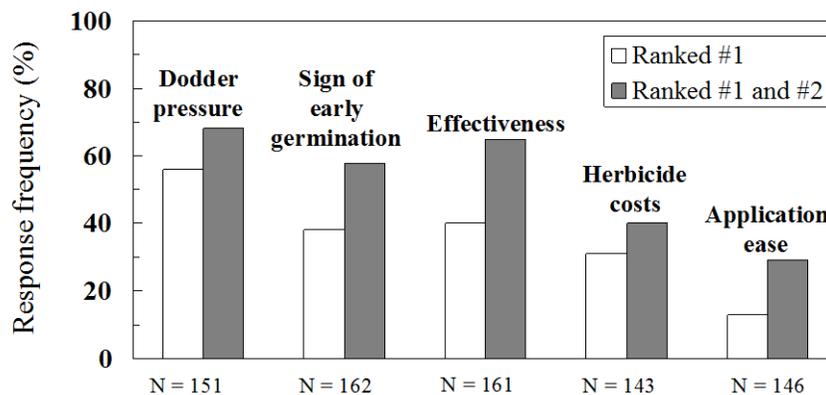
Figure 6. Importance of various resources for obtaining information about dodder control in MA cranberry production.



Factors Influencing Management Decisions.

Growers were asked to rank 10 factors, in order of importance, for influencing their decisions on how to manage dodder. Factors that were ranked most often as either #1 or #2 included farm history of dodder pressure (68%), herbicide effectiveness (65%), and signs of early seedling germination (58%) (Figure 7). Herbicide costs (40%) and ease of application (29%) were ranked as #1 or #2 less often, but were still considered important influences on management decisions. Other factors listed less often as influential included weather conditions, soil temperature, and Zone 2 (regulation of chemicals used near or in public drinking water supplies) concerns.

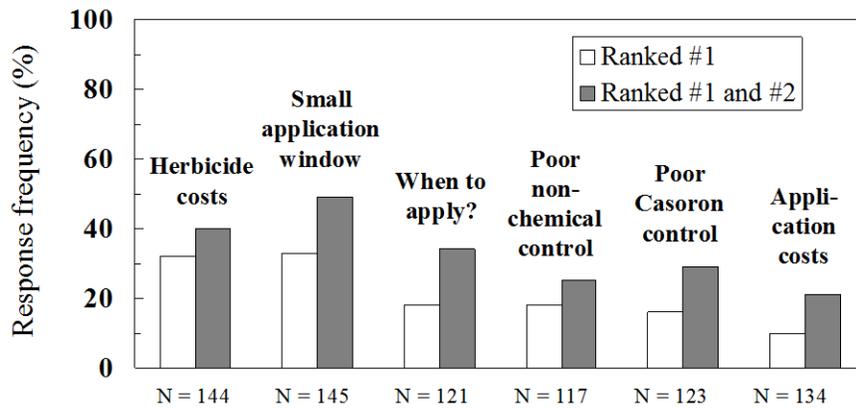
Figure 7. Factors ranked first and second as important influences on decisions for dodder control in MA cranberry production.



Obstacles to Control.

In a similar fashion, growers were asked to rank a list of 12 items, in order of importance, as obstacles to obtaining control of dodder. Small window of application (49%) and cost of herbicides (40%) were ranked most often as either #1 or #2 (Figure 8). Knowing when to apply the herbicides was also frequently ranked high as being an important obstacle (34%). Poor control with a current herbicide (29%) and nonchemical options (25%) were ranked slightly less often as #1 or #2, but were still considered important obstacles.

Figure 8. Factors ranked as first and second as important obstacles for control of dodder in MA cranberry production.



Growers expressed concern about finding ways to reduce the seed bank of dodder, suggesting more research on options that target control prior to flowering. Notable comments for long-term management were minimizing infestations from outside sources by obtaining seed-free vines for replanting, cleaning rented or borrowed equipment prior to farm use, avoiding the use of contaminated harvest boxes, and scheduling water harvest schedules to minimize the distribution of dodder seed capsules from infested to noninfested locations. Growers were also concerned about the reliance on the very effective preemergence herbicide, Kerb, for control of dodder. Currently the herbicide is only available through annual Section 18 permits as full label registration is pending. Cost and availability of manual labor were seen as minor obstacles.

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