

Weed Control Strategies For Liner Production[©]

Leslie Shenberger

Spring Meadow Nursery, 12601 120th Ave., Grand Haven, Michigan 49417-9621 U.S.A.

INTRODUCTION

Weed control in container production is often a demanding, time-consuming challenge. Liners present a greater challenge because of their young age, small size, and many chemical use label restrictions. One must be willing to take a few risks, design and implement experiments, and spend time comparing data to really get control of a weed situation.

METHODS AND TECHNIQUES

Hairy bittercress (*Cardamine hirsuta* L.), common groundsel (*Senecio vulgaris* L.), annual bluegrass (*Poa annua* L.), and liverworts (*Marchantia polymorpha* L.) are the main weed concerns at Spring Meadow Nursery. I experimented with five various methods over the past year:

- Improved sanitation,
- A vinegar solution,
- The herbicides Scythe[®], Rout[®], And Gallery[®],
- Mulches Wulpak[®] and ProScape[®].

Each contributed to a great reduction in the weed problem.

Sanitation was greatly improved simply by assigning different colored buckets to different departments. Five gallon buckets are used for cuttings and hand-pulled weeds. In previous years, these buckets were used interchangeably between departments. Although the buckets were washed and sanitized before used for cutting wood, weed seeds were still transported into propagation. This spring, the growing and propagation departments segregated the buckets based on color. Cuttings are no longer placed in buckets which quite possibly were contaminated with weed seeds. The difference in the amount of weed germination during propagation is astounding and different colored buckets make it easy for workers to know which one to use.

The herbicide Scythe[®] is also good for sanitation inside propagation and growing houses. Scythe[®] is a contact, non-selective herbicide made from fatty acids which can be used as a burndown. However, because Scythe[®] does not volatilize, it can be used safely under plastic to control weeds along sidewalks, walls, and water valves. Using Scythe[®] eliminated another weedseed source and reduced the amount of hand weeding in nonproduction areas.

Scythe[®] was also used as an over-the-top spray on dormant liners. Because Round-Up is used often in fields around desired plants during the winter months, it seemed logical to try Scythe[®] under plastic. Treatments were applied in January when the plants were completely dormant. Sites were treated, labeled, and compared after the spring flush. While no difference was noted in plant health between the treated and nontreated areas, it provided good weed control for bittercress and other weeds. Caution is advised for plants in which the stem remains green such as *Hydrangea macrophylla* and *Euonymus alatus* 'Compactus'. Although Scythe[®] is not translocated, it can cause injury to green tissue.

A vinegar solution during winter months was used for control of liverworts. Food-grade vinegar (100 grain) was used at a rate of 15 gal vinegar to 35 gal water. The solution was sprayed while the plants were dormant but the liverworts were actively growing. The vinegar had great control on liverworts and also killed bittercress and annual bluegrass.

Vinegar can be applied anytime after plants are dormant. However, caution is advised on sunny days. Foliar burn was observed on some plants such as *Buxus* and *Buddleja* (plants with larger, fleshy leaves). *Buxus* did not recover but buddleias flushed as normal in spring months. Vinegar will also affect the pH of your media. If spraying large amounts of vinegar on concentrated areas of liverworts, be sure to test your pH weekly. Steps may need to be taken to keep the media from getting too acidic.

Another experiment with two mulches — Wulpak[®] and ProScape[®] — was conducted during the winter months. Mulch is used in the landscape to prevent weed germination so I thought it was worth looking at in a container system. Unfortunately, the Wulpak[®] we received was contaminated with high levels of boron and all test plants died from boron toxicity. Michigan State University is doing more research with nontoxic Wulpak[®]. In the ProScape[®] test plot, weed germination was considerably lower than the control and plants were healthy.

The mulch experiment (ProScape[®] only) was repeated during June. However, application is easier and distribution more even while the plants are dormant. Also note that it is important to keep surrounding area free from weeds because weed seeds will germinate on top of the mulch.

Another key component of our successful weed control was the use of two herbicides, Gallery[®] and Rout[®]. Because neither chemical is labeled for use on liners, I went through the IR-4 program. This program allows off-label use for specialty plants or situations. All liability is on the grower or nursery when you use chemicals under IR-4.

Rout[®] and Gallery[®] gave excellent control of bittercress and groundsel and were easy to use. The labeled rates for container production were used. Rout[®] did cause more leaf burn than Gallery[®] but has been an excellent choice for *Buddleja* and *Euonymus alatus* 'Compactus'. As with all chemicals, plants not listed on the label, or new cultivars, should be tested on trial basis before spraying entire crop. Neither product can be used under plastic; therefore it is important to finish applying around the end of September.

CONCLUSION

Although weed control will always be a challenge, I hope these ideas will help and spawn many other ideas. As mentioned earlier, one must be willing to take a few risks and deal with the pressure of experimenting. To quote our great friend Ralph Shuggert, "To become a good grower, one must kill a lot of plants." Implementing new ways for weed control may be detrimental to some plants but the information gained is worth it.

Question Box General Session Monday, October 2, 2000[®]

MODERATED BY TIM BROTZMAN

TIM BROTZMAN: Question for Kurt Bresko. Could you describe your GA₃ treatment process?

What was the length of time for warm stratification of *Stewartia* seeds?

KURT BRESKO: We used 1000 ppm GA₃ dissolved in distilled water in a flask connected to an air hose; the duration was 3 days. In a series of experiments, Japanese stewartia seeds were identified as recalcitrant, that the optimum warm stratification temperature was 50°F for at least 3 months and long (at least 150 days) cold stratification at 45°F.

VOICE: Did the seedlings abnormally stretch?

JURT BRESKO: No they did not.

TIM BROTZMAN: Question for Jim Johnson from Jacob Yost. With regard to your beetle control, have you used Merit to control your beetles since it is cheaper and essentially the same product?

JIM JOHNSON: No. It is a labeling problem that depends on the chemical companies; Marathon is the ornamental product and we are not going to change that.

TIM BROTZMAN: Brian Maynard, you have a number of questions. When doing propagation using subirrigation, what temperature is maintained in the greenhouse?

BRIAN MAYNARD: 62°F

TIM BROTZMAN: Did you use shading?

BRIAN MAYNARD: At that time of year no. If you are going to root softwood cuttings you would need shade. We use 50% shading in the summer with good results.

TIM BROTZMAN: Did you try to maintain a certain humidity level?

BRIAN MAYNARD: No.

TIM BROTZMAN: Do you think the pH of the medium may be most important during a "window" of time such as root initiation or root elongation? Are you considering this?

BRIAN MAYNARD: Certainly research has shown that pH can affect the uptake of auxin at the base of the cutting. Therefore during the first week or so it would be most important. I don't think any research on the effect of pH has been done on root emergence over the time it takes for roots to emerge.

TIM BROTZMAN: Based on Dr. Hess' research on peat moss, do you feel that some of your positive observations are based on organic compounds found in peat moss

since it is not a chemically inert material? Suggestion, try rooting in a hydroponic system where you adjust the water pH. Your treatment variables will be fewer.

BRIAN MAYNARD: That is a good criticism of the work. However, we were trying to develop a system that was practical for nursery operators.

TIM BROTZMAN: Question for Brent McCown. Recently BT corn was shown to knock down monarch butterfly populations. What is your response to this research with regards to future research in this area?

BRENT MCCOWN: This is a fascinating issue, I actually have a whole lecture on this subject. It was interesting to follow this issue through the press from the time it was announced. The first release was a press release in a letter to the editor. It did not appear in a peer reviewed article. As each press agency picks it up it adds a little more hype to it. Until the final one which is 2 days after it was announced when the Discovery Channel labeled it killer corn. There is a lot of evidence that has come out in the last few months that the dosage needed to impact butterflies in the field is not there. The final lesson is, how much of that information has gotten out to the public?

TIM BROTZMAN: There have been two talks on the propagation of *Berberis* and *Vinca*. In several states the Nature Conservancy has supported publications that list *Berberis* and *Vinca* as invasive exotic species. How should the green industry remain the good guy with this type of pressure?

DICK BIR: All *Berberis* species in some place have been listed as invasive exotic weeds. In other places it is just *B. thunbergii*. These results are observational work with political overtones. It is a keg of dynamite waiting to go off. We need research work. I went through this in North Carolina, and except for an isolated plant or two we found few. In the east we destroyed our native barberry because it was an alternate host of a disease of wheat. When you check where the exotic barberries are growing you find them in the locations that the native grew. With *Vinca*, I have not seen a site in which it was not easily eradicated if you wanted to do that. *Vinca* is found mostly on old home sites and it can be remove easily with standard techniques. With *Vinca* it is a red herring.

TOM MCCLLOUD: I was just involved with this in Pennsylvania. The publication came from Rodale Institute with Pennsylvania Department of Agriculture approval. We knew nothing about this publication until it was out and circulating in the nursery industry. Through a series of meetings we were able to get a stop order on this publication. Later, through a series of meetings, we were able to negotiate a more friendly publication on this issue. The bottom line is you have to be more proactive with this issue or other groups with their agenda will just run over you.