

LITERATURE CITED

Gouveia, R. J. 1984. Rooting cuttings in outdoor mist beds. *Proc. Inter. Plant Prop. Soc.* 34:537-539.

RALPH SHUGERT: Bob, what is your hormone treatment?

BOB GOUVEIA: For *Taxus* we use Wood's rooting hormone, diluted 5:1 (v/v); with more difficult-to-root species, 3:1 (v/v), and for softwood types a 20:1 (v/v).

CLAYTON FULLER: You need to watch slow-release fertilizers use because you can get a salt build-up with some formulations.

Tuesday Afternoon, December 8, 1987

The afternoon session was convened at 1:50 p.m. with Bruce Macdonald serving as moderator.

MODERN FERTILCIDE IN THE NURSERY

CLAYTON W. FULLER

Bigelow Nurseries, Inc.

Northboro, Massachusetts 01532

What is fertilicide? It is the process in which the manufacturer uses a blended fertilizer (in this report it will be 10-10-10) and coats it with a herbicide. In this paper we will only refer to herbicides by their common trade names. The herbicides being used at present for the process and which we will discuss are Dual, Goal, Kerb, Simizine, and Surflan. The blending of these products is covered by EPA Form 3540-16, "Pesticides Report for Pesticide-Producing Establishments". You should secure from your manufacturer a copy of this form and have it on file if you use any of these products.

Although the use of these blended products is not new to agribusiness (the amended EPA Form is dated 1980), they have not been in common use in the nursery industry—maybe due to unavailability.

When we first looked at this program in 1983 we were intrigued with the possibility of applying fertilizer and herbicide in one application. However, being a new program we were not sure it would work. At Bigelow Nurseries we interplant shrubs between rows of shade and ornamental trees and this raised a number of questions about the program. Would it be possible to apply this

material without damaging a sensitive plant in the middle of the block? Would we be able to control grasses and other weeds currently established? Working with the manufacturer and the company's herbicide consultant the answer seemed to be no, we could not expect to control all weeds without some damage to our crop, but we could control approximately 90% by using herbicides that would not be detrimental to the growth of the crop. The decision was made to go for the 90% control on a trial basis in selected fields. The trial results looked very promising so the program was expanded each year. We have not extended this program into fields in which the crop is within one or two years of market; there we are still using our old methods of control. The area in which the program has expanded is in new production fields. Following is the method by which we have implemented this program.

As in any good program, careful attention must be taken in the preparation of the land. The first step is applying 3 qt/A Round-Up plus a surfactant (your choice), to eradicate all vegetation thus eliminating future problems with hard-to-control weeds. Lime and fertilizer are applied and plowing and harrowing operations are completed. After the crop has been planted a cultivator is used to level the land between the rows. Then stones, if you have them (we are blessed with many), are removed and the fertilicide is applied at the rate of 400 lb/A.

METHOD OF APPLICATION

Application is made with a tractor and a three-point hitch spreader. Our spreader has an effective throw of 30 ft. Therefore care must be taken in lining out a field if it is interplanted, i.e., planning ahead so that the row you want to use for application isn't planted.

INCORPORATION

Follow the manufacturer's recommendations when applying herbicides.

1) Irrigation—Always is the best, if available
2) Rainfall—Watch the weather patterns, still a very good alternative, as many acres can be covered in a very short time with this method of application.

3) Cultivation—Shallow cultivation of 1 to 2 in. is still a good proven method of incorporation, although with some herbicides it is not recommended, i.e. Goal. We have not experienced any problems with incorporation. The only problem we have had with this method is if we are in a dry spell. Where we have cultivated there was excellent control, but in the plant row the control was less than desirable, thus requiring a spot spraying of an herbicide such as Round-Up for complete control.

TIMING OF APPLICATION

Spring. It is critical to follow the manufacturer's recommendation at this time of year. Applications ideally should be made before bud break, although some materials appear not to harm emerging growth and none we have used seem to harm mature growth. Goal is the only material that we have used that has damaged leaves in the formative stages to the extent the plant was defoliated. A June 6th application of Goal-Simazine was applied with rain predicted that evening. The day was cool and humid, turning to cold and snow by late afternoon. It is our understanding from the manufacturer that the active ingredient in Goal was not the culprit, but rather it is the carrier they use that has a very high volatility rate in cool or cold, high humidity, rain or snow conditions. It therefore should be applied 12 hr. before any of these conditions exist. We have not quite figured this all out yet. With more experience and proper timing we should eliminate this factor. Refoliation did occur and although no plants were killed because of this, die-back was observed on some of the new growing tips and growth for the season was about one third less than normal.

Fall. Application can be made after the plants are in complete dormancy, but before the ground has frozen. Incorporation methods are the same, although in our region at this time of year (November) we seem to have enough cloudy and rainy periods to complete the application and let rainfall do our incorporation. It has been our experience that some frost in the ground is not detrimental. Freezing and thawing tends to help incorporate the material.

Summer No applications have been made as we feel that with pruning there always is new bud break and varying stages of leaf growth.

Controlling the vagrants. Much has been said and written, we suppose, about having a completely weed-free nursery; but knowing this to be more fiction than fact a good program must be in hand to control any weeds from entering our fields and destroying our fertilicide program. This program can be implemented as we have with knapsack sprayers and a tractor-mounted sprayer using Paraquat for annuals or Round-Up for perennials with very little labor and expense. Hairy vetch is the only problem weed we have and it can be controlled by the above-mentioned method.

Check Plot. A check plot was left to observe the results. The untreated area after a fall application was found to have a 100% population and the treated area a 1% population of grasses and other weeds.

Band treatment and ground covers. Being good shepards of the land and realizing we do not want to destroy our land so it won't grow our next crop, we were interested to see if the rate of herbicide

we are applying would inhibit our winter ground cover. We have planted oats and winter rye between our rows with much success. Because of increasing interest in finding the ideal ground cover for use between tree rows for soil and erosion control, we are looking at methods of applying the herbicide as a band treatment. While banding will increase the cost of application, the increased cost may be offset by the lower cost of material purchased.

Cost of application. In preparing the costs per acre of purchasing and applying these materials, consideration has been given to the fact that we have fields in many locations (Table 1). Therefore costs include equipment, moving, tractors, and travel time to and from these locations are included in the application cost.

Table 1. Costs for application of selected fertilizer and herbicide combinations.

Treatment	Cost (\$)
400 lbs 10-10-10—1.25 lb Simizine-2 lb Surflan Tech per acre:	\$114.50
400 lbs 10-10-10—1.25 lb Goal-2 lb Simizine Tech per acre:	\$134.50
400 lbs 10-10-10—1.25 lb Goal-3 lb Dual Tech per acre:	\$124.50
400 lbs 10-10-10—1.25 lb Goal Tech per acre:	\$119.50
Round-Up of Vagrants—per year	\$ 46.00

Combinations of herbicides were used in all but one application for good control of grasses and other weeds. Goal was used as a single herbicide where we had a sensitive plant, i. e. *Tsuga*, and they had been previously treated with a combination herbicide. **Please read carefully.** These blended materials do not have a long storage life. According to our manufacturer they should be used within 4 to 6 weeks of blending for maximum effectiveness. If possible we try not to use the same combinations in the same fields with each application, thus eliminating the possibility of a single herbicide buildup. Our experience at present indicates that with this program we will be able to completely skip a season of herbicides in some and maybe all fields. We have a 12 acre field under trial this year treated only with controlling the vagrant method and the results are very promising.

CONCLUSIONS

Why did we consider fertilicides? Economics and labor are certainly a prime factor. Within our organization one man and one tractor with spreader can apply the entire fertilization and herbicide program in most fields in a single effort, thus eliminating the need for any other equipment or personnel for this all-important job in the hectic spring and fall seasons. Delegating this program to one person should almost assure the project will be completed on time rather than having to steal people from one job or another to get the job done. Eliminating grasses and other weeds from our fields means no host plants for diseases and pests, cuts the cost and

applications of pesticides allowing us to go to an IPM spraying program, eliminates trash for rodents to live and breed in, cuts our cost for rodenticides, lessens competition for available water, lessens the pressure of irrigation, and last—but first—a non-competitive environment for our plants to grow and flourish in and maybe make the market one year earlier and possibly increasing our profit.

In the spring of 1988 we are going to test a small area of our container operation for this type of program.

RALPH SHUGERT: In Western Michigan Dual has not knocked out yellow nutsedge as you have reported.

SOLVING DRAINAGE PROBLEMS ASSOCIATED WITH AUTOMATIC IRRIGATION SYSTEMS

CHARLES A. HILDEBRANT

*Hildebrant Nurseries
Oldwick, New Jersey 08858*

The modern nursery has faced cost controls in many ways. One of these has been to install automatic irrigation systems in areas used for container production. Whether the automatic system is drip, or overhead spray there is, in varying degrees, waste in the form of run-off. Without a doubt the worst offenders are the various overhead spray systems. They put as much water on the area between the containers as they put in the containers. No great amount of time need be spent around a nursery to see that serious drainage problems quickly build up near irrigation systems.

There are, it turns out, two related problems with this waste water. The first problem is most readily apparent in the form of the surplus water running across the surface of the ground or puddling in the low spots. Through proper grading of the surface the puddling can be eliminated, and the flow can be channeled into areas where its presence can be more easily accepted. The second problem is much more difficult to solve. As the waste water lands on the ground from the sprinklers, or emerges from a pot, it proceeds to run off, following the natural grading of the bed surface. During the process a fair amount is absorbed by the soil itself, or whatever material is being used as the growing surface. Absorption occurs to even a greater degree in the areas where the water has been channeled after it leaves the bed area. The very obvious and, unfor-