MID-WEST NURSERY WEED CONTROL ADMINISTRATIVE STUDY: 1979 PROGRESS REPORT

Harvey A. Holt

The Mid-West nursery weed control program is presently conducting herbicide tests at five nurseries in four states. These include the Vallonia Nursery, Vallonia, Indiana, the Jasper-Pulaski Tree Nursery, Medaryville, Indiana, the Mason State Nursery, Topeka, Illinois, the State Forest Nursery, Ames, Iowa and the Southern Michigan Nursery, Howell, Michigan. This nursery weed control program is part of a coordinated national effort sponsored by State and Private Forestry and the states involved.

A primary objective of these studies is the development of effective herbicide practices to reduce nursery production costs. It is entirely realistic to suggest that a few dollars in herbicides can replace literally hundreds of dollars in hand labor. However, it is probably unrealistic to expect herbicides to totally replace hand weeding. They can be effectively utilized as valuable management tools.

The 1979 program for this Mid-West region deals mainly with herbicide tests on newly sown or newly germinated seedlings. The program involves conifers and hardwoods, and tree and shrub species. The program includes preemergent and postemergent applications and a limited test of preplanting applications.

The herbicide evaluation program for 1979 generally consisted of three distinct tests (Table 1). Past experience has shown napropamide to be safe on many species. Consequently, during 1979 a specific effort was made to evaluate the herbicide on as many species as possible, especially hardwood species. Test A, a single herbicide, napropamide, required a minimum of bed space and was particularly adaptable to many nursery species. All involved nurseries produce a number of species which are minor individually but, in aggregate, occupy substantial bed space and labor commitment.

Test B includes not only napropamide but also other soil active herbicides. These herbicides do not have postemergent activity but do provide residual weed control. Test B herbicides were applied to major hardwood species.

Test C includes the herbicides in Test B plus postemergent chemicals. Test C has been generally limited to 1-0 conifer species.

Associate Professor, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907.

Table 1. Herbicide tests applied in 1979 nursery weed control program.

Test	Herbicide	Product	Rate (lb/acre)
A	napropamide	Devrinol 50W	0, 1.5, 3
B	napropamide	Devrinol 50W	0, 1.5, 3
	oxadiazon	Ronstar 2G	1, 2
	oryzalin	Surflan 75W	1, 2
	DCPA	Dacthal 75W	10.5
	diphenamid	Enide 50W	4
C	napropamide	Devrinol 50W	0, 1.5, 3
	oxadiazon	Ronstar 2G	1, 2
	oryzalin	Surflan 75W	1, 2
	DCPA	Dacthal 75W	10.5
	diphenamide	Enide 50W	4
	acifluorfen	Blazer 2L	0.5, 1
	oxyfluorfen	Goal 2E	0.25, 0.50
	diclofop	Hoelon 3E	1.5, 3
	bifenox	Mowdown 50W	3, 6

The experimental design, plot layout and applications have generally been the same for all nursery tests. However the nursery manager has the final decision regarding treatments applied, degree of replication and species used. Usually the experimental design has been a complete randomized block with three replicates. On request replication has been reduced or eliminated or treatments omitted for particular species.

All treatments were applied by Purdue University personnel with a bicycle-type plot sprayer. Plots are the bed width and approximately 12 to 16 feet long depending on irrigation systems. Plot weeding has also generally been done by Purdue personnel.

The nature of the 1979 tests are defined in Table 2. The program includes 13 conifer species, 12 hardwood tree species, and 22 shrub species produced for wildlife and conservation plantings. Only about one-third of these species were treated at more than one nursery. This provided a reasonable degree of overlap or data bridging while also generating herbicide efficacy data for species unique to each nursery.

In late summer seedlings will be collected from all the plots for evaluation of herbicide effects on the crop species. This information coupled with weed response data will enable the selection of safe and effective herbicide treatments.

Table 2. Herbicide tests applied in 1979 nursery weed control programs by species, location and timing.

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
CONIFERS						
Cedar						
red (1-0) *Juniperus virginiana*			Topeka, IL	A		
white (1-0) *Thuja occidentalis*			Ames, IA	A		
Larch						
European (1-0) *Larix decidua*			Ames, IA	C		
Japanese (1-0) *L. leptolepis*	Medaryville, IN	A*				
Pine						
Austrian (2-0) *Pinus nigra*			Medaryville, IN	A		
jack (1-0) *P. banksiana*	Topeka, IL	B				
ponderosa (1-0) *P. ponderosa*			Ames, IA	C		
red (1-0) *P. resinosa*	Medaryville, IN	C*	Vallonia, IN Topeka, IL	C* C	Howell, MI	C

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Pine (cont'd)						
Scotch (1-0) *P. sylvestris*	Topeka, IL	C	Vallonia, IN	C*		
	Medaryville, IN	C*				
(2-0)			Vallonia, IN	C*		
Virginia (1-0) *P. virginiana*			Vallonia, IN	C*		
white (1-0) *P. strobus*	Medaryville, IN	A	Vallonia, IN	C*		
			Topeka, IL	C		
			Howell, MI	C*		
(2-0)			Vallonia, IN	B*		
(2-1)			Medaryville, IN	C*		
Spruce						
Norway (1-0) *Picea abies*	Medaryville, IN	A			Howell, MI	C
white (1-0) *P. glauca*			Howell, MI	C*		
HARDWOODS						
Alder						
European black *Alnus glutinosa*			Vallonia, IN	A		

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Ash						
green *Fraxinus pennsylvanica*			Vallonia, IN Ames, IA	A A		
white *F. americana*			Vallonia, IN Ames, IA	A A		
Cherry						
black *Prunus serotina*			Topeka, IL	A		
Hackberry *Celtis occidentalis*			Topeka, IL	A		
Maple						
silver *Acer saccharinum*	Vallonia, IN	A				
sugar *A. saccharum*			Ames, IA	B		
Oak						
white *Quercus alba*			Vallonia, IN	A		
Osage Orange *Maclura pomifera*			Ames, IA	A		
Sycamore *Platanus occidentalis*	Vallonia, IN	A				

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Tulip Poplar *Liriodendron tulipifera*			Vallonia, IN Medaryville, IN	C* B		
Walnut, black *Juglans nigra*			Vallonia, IN Medaryville, IN Topeka, IL Howell, MI	C B B B*		
SHRUBS						
Crabapple						
Malus sp.			Topeka, IL Medaryville, IN	B A		
Siberian *M. baccata*			Howell, MI	A		
Dogwood						
flowering *Cornus florida*	Vallonia, IN	A				
grey *C. racemosa*			Topeka, IL Ames, IA Howell, MI	A B A		
red-osier *C. stolonifera*			Ames, IA	A		
shrub *C. amomum*			Medaryville, IN Howell, MI Vallonia, IN	A B* A		

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Elderberry *Sambucus canadensis*	Medaryville	A				
Grape						
fox *Vitus labrusca*			Topeka, IL Howell, MI	A A		
Hawthorne						
Washington *Crataegus phaenopyrum*			Vallonia, IN Medaryville, IN Topeka, IL	A B B		
Honeysuckle						
Amur *Lonicera maackii*			Medaryville, IN Topeka, IL Ames, IA	A A B		
Tatarian *L. tatarica*			Ames, IA	A		
Magnolia						
star *Magnolia acuminata*	Topeka, IL	A				
Mulberry						
red *Morus rubra*	Topeka, IL	A				

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Ninebark *Physocarpus apulifolius*			Ames, IA	A		
Olive						
autumn *Elaeagnus umbellata*			Ames, IA Medaryville, IN Topeka, IL Vallonia, IN	A B B C*		
Russian *E. angustifolia*			Vallonia, IN	A		
Plum						
wild *Prunus americana*			Ames, IA	A		
Redbud *Cercis canadensis*	Vallonia, IN	A	Vallonia, IN	A*		
Rose						
multiflora *Rosa multiflora*			Howell, MI	A		
Skunkbush *Rhus trilobata*			Topeka, IL	A		
Sumac						
shining *Rhus copallina*	Medaryville, IN	A				

Table 2. (cont'd)

Species	Preemergent		Postemergent		Preplant	
	Location	Test	Location	Test	Location	Test
Sumac (cont'd)						
smooth *R. glabra*			Topeka, IL	A		

* - Tests modified in some manner, i.e., unreplicated or treatments added or deleted.