

RESEARCH RESULTS FOR NURSERYMEN

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Horticulture Series No. 7

AGRICULTURAL EXPERIMENT STATION

OF

AUBURN UNIVERSITY

E. V. Smith, Director

August 1966

Auburn, Alabama

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1966

I. SURVIVAL GROWTH WOODY ORNAMENTALS ALONG ROADSIDES

The Horticulture Department, Auburn University Agriculture Experiment Station in conjunction with the Alabama Highway Department and the Bureau of Public Roads, United States Department of Commerce, initiated a study in April 1963 to determine the method of establishing and adaptability of woody plants on roadsides. Detailed results giving all plants and procedures used are reported in the Alabama Highway Research HPR Report No. 13, 1965.

Plantings were made on undisturbed right-of-way, on large cuts, on small cuts, and on fills. The plantings were made in January, February, and March 1964.

Sixty species of shrubs and small trees were planted on undisturbed right-of-ways at three locations. Per cent survival and rate of growth were recorded for each species. The data indicate that Abelia grandiflora (Glossy Abelia), Elaeagnus pungens (Thorny Elaeagnus), Forsythia intermedia (Border Forsythia), Forsythia suspensa (Weeping Forsythia), Forsythia viridissima (Greenstem Forsythia), Ligustrum lucidum (Glossy Privet), Lonicera maacki (Amur Honeysuckle), Photinia fraseri (Birmingham Fraser Photinia), Photinia glabra (Japanese Photinia), Photinia villosa (Oriental Photinia), Pyracantha crenata-serrata (Yunnan Chinese Pyracantha), Robinia pseudoacacia (Black Locust), Rosa hugonis (Father Hugo Rose) and Vitex agnuscastus (Lilac Chastetree) are excellent plants for roadside usage. The per cent survival for these species ranged from 85 to 100 per cent.

Twenty species of woody and herbaceous ornamentals were evaluated for use on large cuts. A total of 240 plants of each species was planted in January and February of 1964. The outstanding plants in this study are Juniperus chinensis sargentii (Sargent Chinese Juniper), Juniperus conferta (Shore Juniper), Juniperus sabina lusitanica (Vonehron Portuguese Savin Juniper), Lonicera japonica halliana (Halls Japanese Honeysuckle), Lonicera heckrottii (Everblooming Honeysuckle), Robinia hispida (Roseacacia Locust), Rosa hugonis (Father Hugo Rose), and Rosa wichuraiana (Wichura Rose). Survival of these plants was excellent (85 - 100 per cent) with the exception of Robinia hispida which had a survival of 66 per cent. This plant did not survive in excessively wet areas at bottom of the cut, but it was very vigorous and suckered freely at the top of cut.

Twenty-eight species of woody and herbaceous ornamentals were evaluated for use on fills. A total of 160 plants of each species was used in this test. The better species in this test are: Juniperus chinensis sargentii (Sargent Chinese Juniper), Juniperus conferta (Shore Juniper), Juniperus horizontalis plumosa (Andorra Creeping Juniper), Juniperus sabina lusitanica (Vonehron Portuguese Savin Juniper), Juniperus procumbens (Japarden Juniper), Lonicera heckrottii (Everblooming Honeysuckle), Robinia hispida (Roseacacia Locust), Rosa hugonis (Father Hugo Rose) and Rosa wichuraiana (Wichura Rose). Even though weed competition and erosion were major problems in this test, survival ranged from 75 to 98 per cent.

Seventeen species of vines, ground covers, and herbaceous perennials were evaluated for use on small cuts. Survival, vigor, and rate of growth of these species were excellent. The outstanding species were Celastrus orbiculata (Oriental Bittersweet), Lonicera japonica halliana (Halls Japanese Honeysuckle), Lonicera heckrottii (Everblooming Honeysuckle), Lonicera sempervirens (Trumpet Honeysuckle), Euonymus radicans coloratus (Purpleleaf Wintercreeper Euonymus), and Hemerocallis sp. (Daylily). Survival percentages of these species ranged from 95 to 100 per cent.

Five species, selected from 1964 observations, (Celastrus orbiculata, Juniperus conferta, Juniperus horizontalis plumosa, Rosa hugonis, and Rosa rugosa) were planted along a fill in February 1965. Ninety-six per cent of these plants (120 of each species) survived. Their vigor and rate of cover were excellent. Celastrus orbiculata was the best plant in this test, and it appears to be quite adaptable to roadside conditions.

The choice of shrubs, vines, and small trees included a few native species. Most of the species chosen were introduced plants that had landscape characteristics that would be valuable in roadside landscape and for erosion control. Much is already known about the use and value of adaptable woody plants native to Alabama. Cornus florida (Flowering Dogwood), Cercis canadensis (Eastern Redbud), Hydrangea quercifolia (Oak-leaf Hydrangea), Rhus sp. (Sumacs), Gelsemium sempervirens (Carolina Jessamine), Myrica cerifera (Southern Waxmyrtle), and many other natives have been used widely. Others, less known, but more specific to the flora of Alabama, such as Croton alabamensis, (Alabama Croton), Neviusia alabamensis (Snowwreath), Symphoricarpus orbiculatus (Indian Currant Coralberry), and Diervilla sessilifolia (Southern Bush Honeysuckle), will be used in later studies as stock is multiplied.

Control of weeds around the plantings is one of the major problems encountered. Hand hoeing is too costly and mowing is practically impossible. Use of selective herbicides soon after planting seems to be the most practical solution. Four herbicides - Azak, Casoron, Dacthal, and Herban - were evaluated for use in July 1965. Of these four, Herban 6 lb./A., Casoron 8 lb./A., and 4 lb./A. were effective in controlling a broad spectrum of weeds. Dacthal at 10 lb./A. was also effective in controlling weeds, but it was not as effective as Herban and Casoron. Azak 20 lb./A. controlled crabgrass but it did not control any other weeds.

This 3-year project terminate June 30, 1966. The following conclusions have been drawn from this project.

1. Abelia grandiflora, Elaeagnus pungens, Forsythia intermedia, Forsythia suspensa, Forsythia viridissima, Malus sp. 'Almey', Malus sp. 'Hopa', Ligustrum lucidum, Lonicera maacki, Photinia fraseri, Photinia glabra, Photinia villosa, Pyracantha crenata-serrata, Robinia pseudoacacia, Rosa hugonis, and Vitex agnuscastus are suitable for planting on undisturbed rights-of-way. The per cent survival of these species range from 85 to 100 per cent, and they remained relatively free of insects and diseases.
2. Of the 20 species of plants tested on the large cut, Euonymus fortunei coloratus, Hemerocallis sp., Juniperus chinensis sargentii, Juniperus conferta, Juniperus sabina lusitanica 'Vonehron', Lonicera japonica halliana, Lonicera heckrottii, Robinia hispida, Rosa hugonis, and Rosa wichuraiana are suitable for planting on cuts. Survival of these species is excellent (85 to 100 per cent) with the exception of Robinia hispida.
3. Juniperus conferta, Juniperus sabina lusitanica 'Vonehron', Robinia hispida, and Rosa wichuraiana are excellent for erosion control.
4. Jasminum floridum, Jasminum nudiflorum, Robinia hispida, Rosa rugosa, and Vinca major performed poorly in excessively wet areas; therefore, their use in such areas should be avoided.
5. Of the 27 species planted along the fill, Juniperus chinensis sargentii, Juniperus conferta, Juniperus horizontalis plumosa, Juniperus sabina lusitanica 'Vonehron', Lonicera heckrottii, Rosa hugonis, Rosa rugosa, and Rosa wichuraiana are suitable for planting along the fill. Survival of those species range from 75 to 98 per cent.
6. Lonicera heckrottii, Rosa hugonis, Rosa rugosa, and Rosa wichuraiana performed better on the fill than on the large cut.
7. The shallow rooted ground covers and vines were not suitable for planting on the large cut or fill because they could not compete with grass or weeds for nutrients and moisture.
8. Of the 18 species of vines and ground covers tested on the small cut, Celastrus orbiculata, Lonicera heckrottii, Lonicera japonica halliana, Lonicera sempervirens, Euonymus fortunei coloratus, and Hemerocallis sp. are most adaptable to the cut. The survival of these plants range from 95 to 100 per cent.
9. Plantings of Celastrus orbiculata, Juniperus conferta, Juniperus horizontalis plumosa, Rosa hugonis, and Rosa rugosa made along a fill in February 1965 were in excellent shape from the standpoint of survival, growth and rate of cover. All five species are suitable for planting along fills.
10. Hardwood cuttings of Celastrus scandens, Celastrus orbiculata, and Rosa wichuraiana were established by sticking the cuttings, but hoeing in the cuttings was not successful. Establishment by seed or root clippings was not successful.

11. Herban 6 lb./A. actual, and Casoron at 4 and 8 lb./A. controlled a broad spectrum of broadleaf and narrowleaf weeds without any phytotoxicity to the ornamental plants.

12. Mowing or bush hogging ground covers and woody vines did not effect plant survival, but did significantly reduce amount and rate of cover.

13. Grasshoppers that feed on crimson clover in early spring attack ornamental plants after the clover dies in mid-May. Therefore, at least one insecticide application should be made to minimize damage.

II. GARDEN CHRYSANTHEMUMS

Twenty-eight varieties were planted as rooted cuttings, one per 4-inch pot, on June 3 and transplanted in beds in the garden on July 2. Records were taken on date of full flower, height, spread. The following varieties (height x spread) were most outstanding: Raggedy Ann (24" x 16"), Golden Fantasy (17" x 15"), Pinknificent (23" x 16"), Millionaire (22" x 20"), Rosey Nook (19" x 18"), Sleigh Ride (14" x 16"), Newgo (13" x 16"), Dan Foley (18" x 22"), Mango (18" x 17"), Marbletop (16" x 22"), Sparkling (24" x 20").

The following is a listing of choice varieties selected from a 5-year study:

<u>Choice Garden Chrysanthemums</u>				
<u>Variety</u>	<u>Color</u>	<u>Average height inches</u>	<u>Average spread inches</u>	<u>Date full flower</u>
Corsage Cushion	White	12"	15"	Oct. 16
Sleigh Ride	White	15"	20"	Oct. 16
Marbletop	White	16"	22"	Oct. 16
Chris Columbus	White	17"	16"	Oct. 12
Kings Ransom	Yellow	22"	15"	Oct. 16
Golden Fantasy	Yellow	17"	16"	Oct. 16
Yellow Chris Columbus	Yellow	16"	16"	Oct. 12
Peking	Yellow	19"	19"	Oct. 16
Tranquility	Yellow	15"	20"	Oct. 8
Newgo	Golden Bronze	15"	19"	Oct. 8
Spunky	Golden Bronze	16"	17"	Oct. 12
Dolli-ette	Bronze	17"	18"	Oct. 16
Cochise	Bronze	15"	17"	Oct. 8
Rambler	Bronze	19"	25"	Oct. 12
Falcon	Bronze	15"	18"	Oct. 16
Champion Cushion	Bronze	17"	20"	Oct. 26
Ruby Mound	Deep Red	12"	14"	Oct. 16
Red Mischief	Red	12"	16"	Oct. 26
Ann Ladygo	Light Pink	18"	18"	Oct. 16
Comet	Light Pink	18"	19"	Oct. 20
Minn Pink	Pink	14"	16"	Oct. 16
Mischief	Deep Pink	15"	18"	Oct. 26
#2 Fuschia Fairy	Deep Pink	18"	20"	Oct. 20
Mango	Deep Pink	17"	17"	Oct. 12
Purple Waters	Deep Purple	15"	15"	Oct. 16

III. HERBICIDAL STUDIES

Efforts were concentrated on weed control under container-grown stock, weed control of field-grown plants.

Container stock Casoron at 1 x (10 lb./A actual), 2 x, 4 x and 8 x rates under Hetz Japanese Holly container-grown stock gave very good control of crabgrass and nutgrass. At the lower rate, some broadleaf weeds did persist as well as some bermudagrass from stolons. All rates of Casoron gave complete control of broadleaf weeds, annual and perennial grasses when used under sawdust. There was no plant damage of the container stock from this herbicide.

Field-grown plants Three rates each of Azak, 80 per cent W.P., Casoron, 50 per cent W.P., Eptam, 6 lb./gal. E.C., Herban, 80 per cent W.P., X14421-38C, Simazine, 80 per cent W.P., and Vernam, 6 lb./gal. E.C., were used in the nursery row of Common Boxwood, Shore Juniper, Roundleaf Japanese Holly, Poinsettia stock plants, and Chrysanthemums. The high rates of X14421-38C, 16 lb./100 sq. ft., caused some damage of Boxwoods, although very good pusley and nutgrass control was obtained. Good control of nutgrass and pusley was obtained by Casoron 8 lb. and 16 lb./A. and Vernam at 8 lb. and 16 lb./A.

IV. MARKETING

A preliminary nursery survey was conducted in Alabama that established pertinent facts about the industry in the State. The nurseries contacted were listed by the Division of Plant Industry, State Department of Agriculture and Industries. Businesses producing crops other than woody ornamentals were omitted.

There were 116 nurseries responding to the first card survey. The nurseries were divided into two groups: those who were wholesale and/or retail and those who were retail only.

The wholesale - retail firms made up the majority of nurseries, reporting \$4,154,497 gross sales. This amount represents 5,210 combined acres of nursery or 73.7 per cent of the nursery acres in Alabama.

Type of nursery stock grown and wholesale value:

<u>Plant Type</u>	<u>Value</u>	<u>Per cent of Total</u>
Broadleaf evergreen shrubs	\$2,519,542	63
Narrowleaf evergreen shrubs	548,088	15
Deciduous shrubs	591,879	16
Ornamental trees	239,565	6

<u>Types of Stock</u>	<u>Per cent of nurseries Producing</u>
Broadleaf evergreen shrubs	98.28
Narrowleaf evergreen shrubs	84.48
Deciduous shrubs	72.41
Ornamental trees	55.17

Per cent of nursery operators by age.

0 - 40	41 - 50	51 - 60	Over 60
29	21	21	29

V. AZALEA - CHEMICAL SPRAYS

Results show that Cycocel and B-9 growth regulator cover sprays on azaleas are just as effective applied to the upper leaf surface only as applied to the low surface or whole leaf surface. Cloudy, dark conditions at time of application is not a factor if rain does not wash off treatments soon after they are made. A dry period of 8 to 12 hours is desirable after applications are made. Coral Bells azaleas treated with Cycocel bloomed 3 to 4 days earlier than those treated with B-9.

