RESEARCH RESULTS FOR NURSERYMEN

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CONTENTS

Effect of Several Retardants on the Growth and Flowering of Forsythia intermedia Zabel

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Nature of work. Effects of 9 growth retardants, 5 applied as drenches in 1 experiment and 8 applied as sprays in another experiment, were studied on Forsythia intermedia Zabel.

Results and Discussion. Plants drenched with 23 ppm ancymidol had reduced height 5 weeks after treatment, dark green foliage which was retained late into winter, and delayed spring flowers (Table 1). After 11 months only ancymidol drenched plants differed in plant height from untreated plants. Sprays of NIA -10637 at 1,000 and 6,000 ppm yielded the shortest plants after 5 weeks. Severe distortion of leaves occurred on BAY -102613 and NIA -10637 treated plants. Very few flowers were observed on Nia -10637 sprayed plants. Ancymidol, ethephon, BAY -102613 and NIA -10637 sprays delayed flowering. After 11 months all sprayed plants had similar heights and resumed normal growth except plants receiving 6,000 ppm NIA -10637.

This research on forsythia shows that ancymidol can be a safe, effective and persistant retardant on a rapidly growing woody species and that BAY -102613 and NIA -10637, in addition to retardation, cause severe morphogenic effects on forsythia.

Publication. Sanderson, K. C. 1973. Screening chemicals for controlling growth and flowering of Forsythia intermedia Zabel. HortScience 8:477-479.

Table 1. Height, Plant Appearance and Flowering Response of Forsythia Intermedia Zabel After Chemical Treatment.

Chemical	Chemical	Rate	Height 5 wk.	Height 11 mo.	Plant appearance	Flowering response
	Drench experiment	mg per 2.5ℓ can				
Check	Check	- - - -	49.8[z]a	79.3 a	Normal	Normal
α-cyclopropyl-α-(4-methoxyphenyl)-5-pyrimidinemethanol	Ancymidol	3	19.1 c	59.3 b	Some branching, leaves dark	Delayed
2,4-dichlorobenzyl-tributylphosphonium chloride	CBBP	63	42.7 b	70.1 ab	Normal	Normal
(2-chloroethyl) trimethylammonium chloride	Chlormequat	2,951	49.0 a	81.5 a	Normal	Normal
Morton confidential chemical	EP-426	1	40.0 b	82.0 a	Normal	Normal
Morton confidential chemical	EP-374	1	43.4 b	77.8 a	Normal	Normal
	Spray experiment	ppm				
Check	Check	- - - -	40.2 a[z]	73.5 a	Normal	Normal
2-chlorofluorenecarbonicacid-(9)-methyl-ester	BAY-102613	10	31.1 ab	75.5 a	Considerable branching-off color, distorted	Normal
		50	26.0 bc	87.8 a	Branching leaves, off-color, distorted	Normal
Succinic acid-2,2-dimethylhydrazide	SADH	2,500	38.6 a	91.8 a	Normal	Normal
α-cyclopropropyl-α-(4-methoxyphenyl)-5-pyrimidinemethanol	Ancymidol	125	34.4 ab	84.6 a	Some branching, leaves dark green	Delayed
		250	36.7 a	89.8 a	Some branching, leaves dark green	Delayed
(2-chloroethyl)phosphonic acid	Ethephon	1,000	34.1 ab	79.6 a	Normal	Normal
Ethyl hydrogen 1-propylphosphonate	NIA-10637	1,000	17.6 cd	75.8 a	Severe witches-broom, leaves distorted, killed	Delayed, few flowers

Table 2. (Cont'd.)

Chemical	Chemical	Rate	Height 5 wk.	Height 11 mo.	Plant appearance	Flowering response
	Spray experiment					
Ethyl hydrogen 1-propylphosphonate	NIA-10637	6,000	15.2 d	33.0 b	Severe witches' broom, leaves distorted, killed	Delayed, few flowers

[z] Mean separation for experiment in columns, by Duncan's multiple range test, 5% level.

Green Control of Weeds and Ornamental Growth

Kenneth C. Sanderson

Nature of Work. The green control method will rely on new and better chemicals. The new type chemicals will retard and disrupt the growth of weeds instead of killing them. These chemicals may also control the size and shape of desirable landscape plants with little or no injurious effects. Potential chemicals for green control have been evaluated in greenhouse and field studies. Morningglory, radish and silktree seedlings, 4 cm high, were sprayed with 500 ppm Maintain CF 125, 500 ppm Maintain CF 125 plus 31,619 ppm MH-30, 31,619 ppm MH-30, 500 ppm Niagara 10637, 500 ppm Niagara 10656, 400 ppm ancymidol, 400 ppm ancymidol plus 1,000 ppm CEPA, and 5,000 ppm DPX 1840 in a greenhouse experiment. In April of 1971 and May of 1972, kudzu was sprayed with 1,000 ppm Maintain CF 125, 1,000 ppm Maintain CF 125 plus 3,077 ppm MH-30, 3,077 ppm MH-30, 2,000 ppm CEPA, 6,000 ppm Niagara 10637, 9,000 Niagara 10637, 4,800 ppm DPX 1840 and 9,600 ppm DPX 1840 in field experiments.

Results. Silktree was damaged by all sprays except Niagara 10656 and DPX 1840. Ancymidol, Maintain CF 125, Maintain CF 125 plus MH-30, and ancymidol plus CEPA damaged radish and morningglory. Maintain CF 125 alone, or in combination with MH-30, or CEPA, controlled kidzu growth for 6-8 weeks.

Publication. Sanderson, K. C. 1973. Green Control on the Way - To Control Weeds, Regulate Ornamental Growth. Highlights of Agr. Res. Agr. Exp. Sta. Auburn Univ. 20(2):10.

Effect of PBA on the Branching of Azalea cv. Kingfisher, Dwarf Burfordi Holly and Japanese Holly

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work. PBA (Shell Chemical Company's synthetic cytokinin SD 8339) has been reported to influence branching in some plants. The purpose of this work was to test PBA for branching effects on azalea cv. Kingfisher, dwarf Burfordi holly and Japanese holly. Recently established liners were sprayed with 0 ppm, 200 ppm, 400 ppm, 800 ppm, and 1,200 ppm PBA. Dupont's surfactant B 955 was added (4 ml/ℓ) to all sprays. Treatments were applied to plants until runoff on Feb. 21, 1973 and 2 weeks later, all plants were sheared. The azaleas, Burfordi hollies and Japanese hollies were grown in a lightly shaded, (5,000 ft-c maximum) fiberglass; polyethylene; and glass greenhouses, respectively. Normal cultural practices for container plant production were used on all plants. Total number of shoots per plant were determined on August 9, 1973.

Results and Discussion. Branching in Japanese holly was consistently increased by PBA spray concentration up to 800 ppm (Table 2). Sprays of 1,200 ppm PBA caused a reduction in shoot number, very short shoots and a witches-broom effect on the plants. Azalea responded erratically to PBA sprays. Sprays of 200 ppm and 800 ppm increased shoot number in azalea, whereas concentration of 400 ppm and 1,200 ppm PBA reduced shoot number. With Burfordi holly, all sprays increased branching except 800 ppm which reduced shoot number. PBA shows much promise as a chemical for increasing branching in woody ornamentals, however further research is warranted to explain some of the erratic responses observed in this experiment.

Table 2. Effect of PBA Sprays on Total Number of Shoots Per Plant of Three Woody Ornamentals

PBA concentration	Number of shoots per plant[z]		
	Azalea	Burfordi Holly	Japanese Holly
Check	15.1	4.4	56.3
200 ppm	17.7	4.6	67.6
400 ppm	12.3	4.8	92.7
800 ppm	15.3	3.7	101.9
1,200 ppm	14.3	4.8	95.3

[z] Means for 7 azaleas cv. Kingfisher, 40 Burfordi hollies and 10 Japanese hollies, respectively.

Publications: None

Use of Municipal Compost as a Micronutrient Additive on *Forsythia intermedia* Zabel.

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work. Research at Auburn has revealed that municipal compost contains Cu, Mn, Fe, Zn, and Mo, therefore municipal compost might be used as a micronutrient source. Two municipal composts, Alive (a quick, digester over, compost produced by Lone Star Organics Co., Houston, Texas) and Mobile-Aid (a slow, windrow method, compost produced by the City of Mobile, Alabama), were compared with the micronutrient sources listed in Table 3. Established liners of *Forsythia intermedia* Zabel grown in 2.5ℓ cans containing 1:1:1 (v/v/v) soil, peat, and perlite, received micronutrient treatment on August 19, 1970. No attempt was made to balance elements or amounts of elements applied. Standard cultural methods for field grown containers were used. Flowering and plant condition was observed 8 months after treatment and plant height was recorded 1 year after treatment.

Results and Discussion. Most plants flowered normally and did not exhibit any phytotoxicities. Plants receiving FTE, Mobile-Aid or Rayplex mixture were delayed in flowering in some replications. Treatment with Green-Garde micronized iron resulted in the tallest plants, however S.T.E.M. treated plants were just 3.3 cm shorter than Green Garde plants. Rayplex mixture plants yielded the shortest plants, followed by Mobile-Aid and Alive compost plants. These results may indicate a response to iron since Green Garde micronized iron, STEM and iron chelate supply considerable iron. Also, previous work at Auburn revealed Mobile-Aid to have low available iron and a high pH. The application of 240 ml of municipal compost may have influence soil aeration in addition to nutrient and pH effects.

Table 3. Effect of Various Micronutrient Additives on the Height of Forsythia intermedia Zabel

Additive	Element Analysis (%)						Rate (ml/2.5ℓ)	Height (cm)
	B	Cu	Fe	Mn	Mo	Zn		
Alive Compost	Trace	0.07	1.03	0.06	0.001	0.23	240.0	69.1
Fritted Trace Elements No. 504	3.80	7.00	14.00	7.00	0.07	7.00	1.2	72.6
Green Garde Micronized Iron	-	-	-	32.6	-	-	4.8	81.6
Iron Chelate No. 330	-	-	10.0	-	-	-	150 (0.29/ℓ)	72.3
Mobile Aid Compost	0.005	0.05	0.51	0.05	-	0.10	240.0	66.0
Rayplex Granular Mixture	-	0.76	3.84	1.74	-	3.15	1.2	58.4
Soluble Trace Element Mixture	4.64	3.20	7.50	8.15	0.046	4.50	150.0(0.89g/ℓ)	78.3
Check	0	0	0	0	0	0	-	70.4

Publications: None.

Comparison of Various Dry Fertilizers on the Growth of Flowering Azaleas

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work. Red American Beauty and Chimes azalea plants growing in 12.5 cm pots were shifted to 15 cm pots using sphagnum peat moss as a transplanting material. The medium was amended with 56 g of dolomitic limestone and 56 g of gypsum per bushel. Fertilizer treatments were added as shown in Table 4. Plants were grown in an evaporative cooled greenhouse from July 14 to November 10. From November 10 to December 15 the plants were stored in a lighted refrigerator at 45° F. Following storage, the plants were placed in a 60° F. MNT greenhouse for flowering. Dry weight was obtained at flowering on 5 Red American Beauty plants and 3 Chimes plants in each fertilizer treatment.

Results and Discussion. Flowering occurred on January 31 for Red American Beauty plants and on February 16 for Chimes plants. Fertilizer treatments did not seem to influence the time of flowering. Sulfur-coated urea and Osmocote 18-6-12 produced the heaviest plants for the two cultivars (Table 4). A mixture of Osmocote 18-6-12 and Osmocote 14-14-14 was the third best treatment for Chimes plants whereas untreated Red American Beauty plants ranked third best. When the dry weights of the cultivars were averaged the 3 best treatments (in order) were sulfur coated urea, Osmocote 18-6-12 and Mag-Amp.

Table 4. Dry Weight (g) of Chimes and Red American Beauty Azaleas Grown on Various Fertilizer Regimes

Fertilizer treatment	Cultivars		Mean
	Chimes	Red American Beauty	
Check	235.4	218.7	227.1
12g Agriform tablet	266.2	174.5	220.4
Sta-Green 12-6-6, 198g/bu.	255.2	155.0	205.1
Sulfur-coated urea 38-0-0, 66g/bu.	284.4	274.3	279.4
Nitroform urea 38-0-0, 66g/bu.	230.2	176.7	204.5
Mag-Amp 6-44-7, 254g/bu.	253.2	228.3	240.8
Osmocote 18-6-12, 205g/bu.	301.6	249.2	275.5
Osmocote, 14-14-14, 264g/bu.	264.4	191.7	228.1
Osmocote mixture 18-6-12, 153g/bu.	283.4	160.0	221.7
8-8-8 254g/bu.	247.8	201.3	224.6
Mean	262.2	203.2	232.7

Use of Various Herbicides Mulches for Weed Control in Container-Grown Ornamentals

Kenneth C. Sanderson and Willis C. Martin, Jr.

Nature of Work. Processed municipal compost and sawdust were combined with dichobenil (Carsoron™, Thompson Hayward) or UC 22463 (Sirmate™, United Carbide) and used as mulches on Pfitzer Juniper, Shore Juniper, and Pittosporum (Table 5). Plants (liners) were established in 2.5ℓ containers on May 15 using a steam pasteurized medium of (1:1:1, v/v/v) soil, peat and perlite. On August 1, mulch treatments were applied to the soil surface of each container to a depth of 2.5 cm. A sheet of tar paper was placed under the containers at the beginning of the experiment to control weeds between the containers; however weeds were allowed to grow in the walks on the edge of the paper. Natural weed infestation occurred from the weeds growing in the walks and surrounding areas. Normal container production practices for field grown plants were followed. A randomized block design consisting of 5 plants per treatment and 4 replications was used with each species. On November 20, the containers were rated for the number of weeds per container as follows: 0 = no weeds, 1 = 1-3 weeds, 2 = 4-6 weeds, 3 = 7-9 weeds, 4 = 10 or more.

Results and Discussion. No phytotoxic injury was observed on any of the plants treated with dichlobenil or Sirmate mulches. Natural weed infestation was not a serious problem in this experiment; therefore weed control benefits were not great. Generally sawdust plus Sirmate, sawdust, municipal compost plus Sirmate gave the best weed control (Table 5). With Pfitzer Juniper plants, mulches of sawdust plus Sirmate reduced the weed control rating by more than 50 percent over the no mulch treatment. Sawdust mulch provided the best weed control on Shore Juniper plants. Pittosporum containers had the fewest weeds when mulched with sawdust plus dichlobenil.

Table 5. Weed Control Rating of Various Mulch Treatments Applied to Three Container Ornamentals

Mulch treatment (2.5 cm depth)	Weed control rating[z]			
	Pfitzer Juniper	Shore Juniper	Pittosporum	Mean
Check	1.1	1.1	1.9	1.4
Municipal Compost	0.7	1.3	1.5	1.2
Municipal Compost, plus dichlobenil 114g/6 cu. ft.	1.0	0.9	1.6	1.1
Municipal Compost, plus Sirmate 114g/6 cu. ft.	0.8	0.9	1.2	1.0
Sawdust	0.9	0.7	1.4	1.0
Sawdust plus dichlobenil 114g/6 cu. ft.	0.9	1.3	0.7	1.3
Sawdust plus Sirmate 114g/6 cu. ft.	0.5	0.9	1.3	0.9

[z] Weed control rating (means for 20 plants per species): 0 = no weeds, 1 - 1-3 weeds per container, 2 = 4-6 weeds, 3 = 7-9 weeds, 4 = 10 or more.

Publications: None