Response of Woody Ornamentals to a Fatty Acid Pinching Agent[1]

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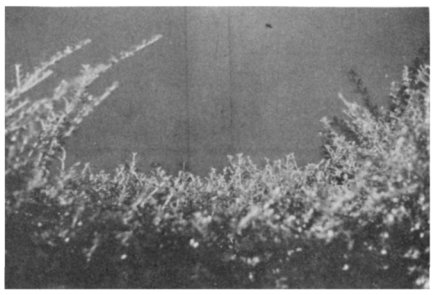

Fig. 2. Section of *Cotoneaster divaricata* hedge maintained with Off-Shoot-O. Sections either side were not pruned.

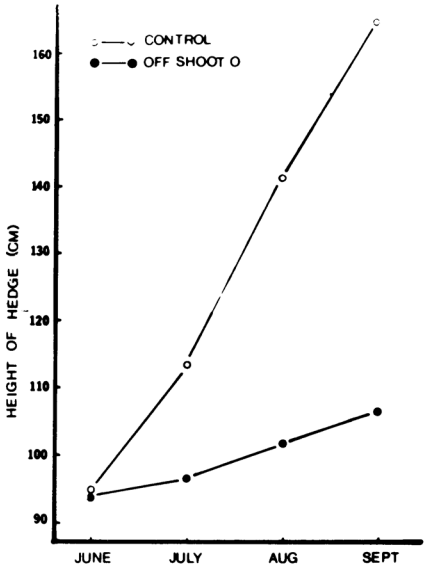

Fig. 3. Height of chemically pruned and unpruned sections of *Cotoneaster divaricata* hedge.

Abstract. **Sprays of 4% Off-Shoot-O (45% methyl esters of fatty acids, 4% C6, 56% C8, 38% C10, 2% C12) to container-grown** *Cotoneaster divaricata* **Rehd. & Wils.,** *Pyracantha coccinea* **Roem. cv. Lalandi and** *Rhododendron carolinianum* **Rehd. at the beginning of each of 2 growing seasons increased shoots over unpruned plants but reduced fruit clusters of pyracantha. Sprays maintained hedge height of cotoneaster but not** *Forsythia* × *intermedia* **Zobel or privet (*Ligustrum ovalifolium* Hassk).**

Chemical pruning and growth retardants offer the possibility of reduced pruning labor in the production and maintenace of woody ornamentals. Methyl esters of fatty acids have been found to kill and inhibit bud growth of many plants (1, 2, 3, 6, 8) and are commercially used in azalea production (4, 7). Kozel (5) has reported that *Cotoneaster, Ligustrum* and *Rhamnus* can be chemically pruned by these materials. In this study, Off-Shoot-O was evaluated on container-grown plants and on hedges of a number of woody ornamentals.

Thirty plants of 3 species (Table 1) were grown in 3.8 liter polyethylene containers for 2 growing seasons. Three treatments (unpruned control, hand-pruned and 4% Off-Shoot-O sprayed to run off) were applied to 10 plants of each species at the beginning of each season when new growth was approx 4 cm long.

At the end of the 2nd season Off-Shoot-O treatments had more shoots per plant than the unpruned controls and about as many as the hand-pruned rhododendron and pyracantha but fewer than the hand-pruned cotoneaster. Chemically-pruned plants were similar in height to hand-pruned plants, but appeared denser (Fig. 1). These results indicate that commercially acceptable plants of rhododendron and cotoneaster can be produced using Off-Shoot-O. This material is unsuitable for pyracantha because it reduced fruit clusters.

In order to determine if Off-Shoot-O could maintain hedges, 3 species (cotoneaster, forsythia and privet) were shaped in the winter by hand pruning and maintained with 4% Off-Shoot-O sprayed at monthly intervals beginning in May, when new growth was approx. 4 cm long, and ending in August.

Cotoneaster hedge sections were maintained successfully for 1 growing season by the monthly treatment (Fig. 2, 3) but it was not possible to maintain forsythia and privet without some hand pruning. The interior shoots not covered by the spray grew more rapidly than the treated shoots, resulting in uneven shoot growth at the top of the hedge.

Our results indicate that it is possible to control growth of cotoneaster hedges with Off-Shoot-O sprays. Chemical pruning agents may be a promising material for the woody ornamental and landscape industries but species interaction must be carefully evaluated.

Table 1. Effect of pruning treatment on height, number of shoots, and fruit clusters.

Treatment	*Cotoneaster divaracata* Ht (cm)	*Cotoneaster divaracata* No. shoots per plant	*Pyracantha coccinea* 'Lalandi' Ht (cm)	*Pyracantha coccinea* 'Lalandi' No. shoots per plant	*Pyracantha coccinea* 'Lalandi' No. of fruit clusters	*Rhododendron carolinianum* Ht (cm)	*Rhododendron carolinianum* No. shoots per plant
Unpruned control	92	162	76	103	24	30	11
Hand pruned	67	271	49	159	16	22	26
Chemically pruned	73	233	64	179	3	23	24
HSD 5%	11.2	24.6	19.5	22.0	9.1	5.2	4.6

Fig. 1. Unpruned control, hand pruned and chemically pruned *Cotoneaster divaricata* plants at the end of the 2nd seasons.

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Rooting Mugo Pine Cuttings[1]

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Abstract. **Rooting of cuttings of 4 clones of Mugo pine (*Pinus mugo* var. *mughus* Zeneri) averaged 75% when collected in June and dipped in a solution of 0.6% indolebutyric acid (IBA) plus 0.5% benomyl in 95% ethyl alcohol. Cuttings collected in March and June rooted better than those of September or December. Clones varied in rootability.**

This paper reports the effects of various concentrations of IBA on rooting of 4 clones of Mugo pine cuttings taken at various times of the year.

Ten cuttings were collected from each of 4 shrubby Mugo pine clones (initially 10 years old) on the campus of the Univ. of New Hampshire at each of 4 dates in mid month (March, June, Sept., and Dec.) over a 2-year period. Two cuttings from each of the 4 clones at each collection were dipped for 5 sec in each of the 5 solutions of IBA (0.1, 0.2, 0.4, 0.6, and 0.8%) plus 0.5% benomyl in 95% ethyl alcohol. The treated cuttings were then inserted, half the length in a rooting medium, one in each of 5 x 10 x 25 cm polyethylene bags filled with a mixture of 1 peatmoss:1 fine tree bark:1 aged white pine saw dust with the bottom corners open for drainage (Fig. 1). This medium had given good results for rooting cuttings of Monterey pine (*Pinus radiata* D. Don.) and eastern white pine (*P. strobus* L.) (1, 2). The cuttings in the polyethylene bags were kept in a mist bench for 4 months, then examined for rooting.

Rooting response in each of the 2 years was similar and results are combined (Table 1). Cuttings with 0.6% IBA treatment rooted the best and produced the most roots per cutting.

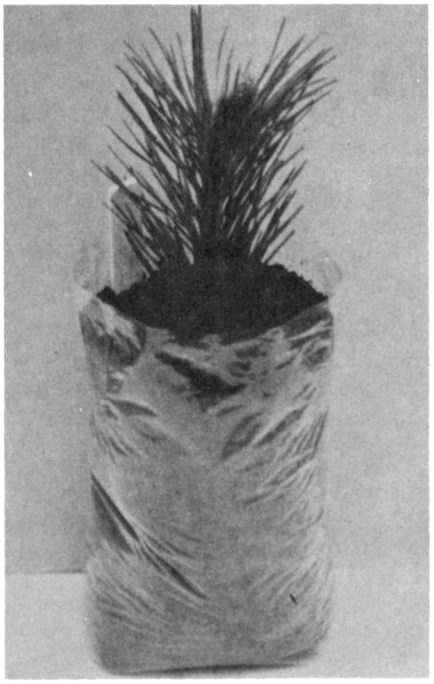

Fig. 1. Mugo pine cutting inserted in the medium in a polyethylene bag.

Table 1. Effect of IBA concn, season of collection, and clone on rooting of Mugo pine cuttings.

Variable	No. of cuttings	% rooting[z]	No. roots per cutting
IBA concn (%)			
0.1	64	9.4 a	2.5
0.2	64	25.0 bc	3.5
0.4	64	28.1 c	4.6
0.6	64	37.5 cd	6.0
0.8[y]	48	16.7 a	4.4
Season			
March	80	38.8 b	4.2
June	72	36.1 b	5.9
September	72	8.3 a	3.8
December	80	11.3 a	3.4
Clone			
1	76	44.7 c	4.8
2	76	28.9 b	4.0
3	76	17.1 b	5.3
4	76	3.9 a	3.3

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

[y]Not used for June and Sept. collections in the first year.

Table 2. Rooting of Mugo pine cuttings collected in different months and treated with IBA (2 year average).[z]

Collection date	% rooting, IBA concn (%) 0.1	0.2	0.4	0.6	0.8
March	12.5	37.5	56.3	50.0	37.5
June	12.5	31.3	37.5	75.0	12.5
Sept.	6.3	12.5	6.3	12.5	0
Dec.	6.3	18.8	12.5	12.5	6.3

[z]A composite of the 4 clones.

March and June cuttings gave the highest rooting percentage and both were significantly higher than Sept. or Dec. Buds of March and June cuttings expanded rapidly in the rooting media to produce new growth. The good results of March and June cuttings may be explained on the beneficial influence of new growth.

There was considerable variability in rooting among the 4 clones tested. Rooting ranged from 3.9 – 44.7% (Table 1).

Soft cuttings of current year growth were tested in June, 1973 but 95% of them died and none rooted. Fungus infection was observed, but the species was unidentified.

Our results indicate that propagation of selected clones of Mugo pine appears practical using March-June cuttings and a 0.6% IBA dip. The 4 clones averaged 75% rooting in June at this rate (Table 2). Apparently IBA which promotes rooting in other pine species (1, 2, 3, 5) is also effective for Mugo pine. Although benomyl was added as a fungicide there is some recent indication that it has some rooting effect in eastern white pine (4) and this may be a factor here.

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