controls annual grasses and some of the same broadleaf weeds that are controlled by oryzalin and napropamide. As with oxadiazon it should not be applied to wet foliage and the granules should be washed off within a short time after application

Other herbicides such as DCPA (Dacthal), diphenamid (Enide), and pronamide (Kerb), though not registered specifically for use in containers, are tolerated by a wide range of ornamentals. They control annual grasses and some kinds of broadleaf weeds, including the chickweeds, and may have potential for use in combination with oxadiazon

All of these herbicides are primarily for preemergence application to control weeds as they germinate or emerge from the soil. Oxyfluorfen does give some postemergence activity but its most efficient use is as a preemergence herbicide. Pronamide controls established perennial grasses and also controls grasses preemergence. Research continues on control of weeds after emergence, particularly on the pearlwort problem.

The use of herbicides should be combined with whatever hand weeding is necessary to control weeds which escape the treatments, and a general program of maintaining the nursery as free of weeds as possible will help to reduce contamination of the containers with weed seed

If a soil mix contains weed seed, fumigation or heat treatment will eliminate much of the weed problem initially. With an unfumigated mix containing weed seed, herbicides should be applied as soon as possible after transplanting and settling of the medium in the container. Even a container that starts out free of weed seeds will be contaminated by wind-blown seed within a few weeks, and herbicides should be applied in anticipation of the problem before germination and weed emergence starts.

USE OF OSMOCOTE IN CONTAINER GROWING

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The base of a soil mix is very important in successful container growing The mix needs to have a high water holding capacity, with sufficient porosity to give rapid drainage

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and aeration. It also needs to be retentive of nutrients and free of weeds, insects and diseases. Soil based mixes, in our climate, are generally poor

The weather in the southwest corner of British Columbia is very wet in fall, winter and spring but we can usually expect a long stretch of hot, dry, weather during the summer. With this weather pattern in mind — we must steer clear of any mixes containing soil; they are just too heavy to withstand our three seasons of monsoons Our mix MUST drain freely and the beds underneath the containers must also drain freely.

The mainstay of our mix is a sawdust:peat mixture in 3:1 proportions Some growers add about 10% sand. Hemlock or fir sawdust is generally used, as it is the most readily available and the least expensive of the common wood waste material. Bark or bark.peat mixes are beginning to be used, but are more expensive than sawdust. Either materials have been doing an equally good job in our trials.

More and more of the logs being used for lumber are being brought down to the coast for sawing, resulting in salty sawdust when cut. Growers must be careful to order sawdust produced from logs taken from inland sources. Many sawdust truck drivers have purchased their own salt meters to test their loads before delivery.

The sawdust:peat mixes do not hold nutrients well. This is one of its major drawbacks. Soluble fertilizers leach readily causing plant starvation during wet periods. A total liquid feeding program is not desirable nor recommended for our area. We have found that slow-release fertilizers, such as Osmocote, are mandatory for our container growing. Because we are using sawdust — a material no one else uses, trials are being carried out to establish the best rates and formulations of fertilizers to use in our mix.

Trials Results.

In 1979 we established plots of *Rhododendron*, *Thuja occidentalis* 'Smaragd', *Cornus* 'Elegantissma' (= *C. alba* 'Argenteo – marginata'?), and *Prunus cistena*, with Osmocote 18-6-12 at 8, 10 and 12 lbs; Osmocote 19-6-10 +Fe (Sierrablen) at 8, 10 and 12 lbs, and Osmocote 18-5-11 (14 mo) at 12, 14 and 18 lbs. per cu. yd. We also compared the use of our locally developed and used Saanichton Minor elements with Fritted Trace elements and Micromax. Of the 13 different treatments, Osmocote 18-6-12 at 10 lbs/yd^3 seemed to work the best in producing quality plants with good coloring and branching. From this trial we came to some conclusions:

1) none of the Osmocote formulations or rates provided

enough fertilizer to last an entire season without top-dressing.

2) Fertilizer is available to plants immediately at potting, making additional soluble fertilizer unnecessary or even undesirable in the mix.
3) Osmocote 18-6-12 (9 mo) at 8 lbs/yd, the standard rate at that time, was too low and did much better at 10 lbs, if careful watering was practiced.
4) Micromax did not significantly increase growth or quality of plants unless the Osmocote rate was also increased

In 1980 expanded trials increased rates of both Osmocote and minor elements. The color of *Rhododendron* (azalea), 'Mothers Day', was significantly increased with Osmocote 18-6-12 at 12 lbs/yd^3 and with the use of Micromax. *Thuja occidentalis*. 'Pyramidalis' and *T. occidentalis* 'Smaagd' color was better with all rates of 18-6-12 than with 17-7-12 (14 mo). Topdressing was required in all treatments

A trial using composted bark, where the suppliers were suggesting that no additional nutrients were required, showed that a complete addition was necessary. Growth in the bark mix was similar to sawdust and peat when all essential nutrients were added, that is lime, superphosphate, minor elements and Osmocote.

In topdressing trials, Osmocote 18-6-12 (9 mo) at 1 level tbsp/gal did a better job than 14-14-14 or 19-6-10 +Fe (Sierrablen). Also 18-5-11 (14 mo) at 1 hpg tbsp/gal did well as a topdressing.

In 1981 trials so far, all treatments are looking the same. We are trying the 17-7-10 (14 mo) this year, at some very high rates.

CONCLUSIONS

1 Osmocote 18-6-12 (9 mo) at 10-12 lbs/yd is good for most species. We have not had good results with 18-5-11 or 17-7-10 (14 mo), even at high rates.
2. Topdressing will be required in mid-summer after spring potting. The end of July seems to be the best time.
3 Winter feeding is suggested *after* the onset of dormancy Plants are always more hardy when they are growing with good nutritional status. (*Word of Warning*. Osmocote *does* release during winter in plastic shelter houses. A heavy watering to leach salt buildup during winter, once/month, will prevent salt damage.)

4. Micromax has worked especially well when used with Osmocote at high rates.

FOLIAR NUTRITION OF LANDSCAPE PLANTS

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Above-ground part plants — leaves, stems, branches and flowers — can absorb nutrients, pesticides and growth regulators from sprays. For almost seventy years, growers of commercial crops have used foliar sprays of nutrients to control minor element deficiencies in fruit plantings. Today, there is renewed interest in foliar nutrition due to increased cost of fertilizer, environmental concerns about nutrient applications to soil which may be carried into ground water supplies, and better knowledge of the plants that we grow. The main advantages of foliar nutrition, as compared to root applications, are (a) more rapid and (b) more efficient absorption of nutrients (3). To utilize these advantages, we must know the growth patterns of plants and when to apply nutrients for best effect

Several environmental factors affect foliar absorption. For example, an increase in temperature increases foliar uptake due, in part, to an effect on processes of penetration. In addition, there is a great influence of temperature on the structure of the plant which in turn greatly affects foliar absorption (4). The outermost layer of the cuticle on the leaves of most plants is composed of epicuticular waxes. These waxes, such as the bluish bloom on cabbage leaves, grapes, and apples, are exuded onto the surface of leaves in regular patterns. In tests where plants were grown at warm temperatures at relatively high light intensities, factors which favor foliar absorption, the epicuticular waxes were arranged in an upright fashion and did not cover the leaf surface completely, leaving small openings to the leaf surface below. In contrast, in plants grown at low temperatures and relatively low light intensities, the waxes were arranged as smaller or densely packed platelets which did not allow contact with the cell surface beneath. Thus, it would seem that the effect of light and temperature is indirect, affecting epicuticular waxes which, in turn, influences contact between the treating solution and the cell surfaces beneath.

The pH of the nutrient solution applied to plants also influences foliar uptake (3); pH affects the form of the nutrient and its ability to hold water which allows a longer time period