

# OSMOCOTE IN THE PROPAGATION HOUSE<sup>1</sup>

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**Abstract.** Four cultivars of *Rhododendron obtusum* were propagated in equal parts of peatmoss and sand, top-dressed with Osmocote 19-6-12 at 0, 7, and 14 g per 0.093 m<sup>2</sup> immediately after sticking. All cuttings top-dressed with Osmocote developed heavier root systems, produced more top growth and flowered less than the cuttings that were not top-dressed.

Cuttings that are allowed to remain under mist for a prolonged period of time often become chlorotic. The lower leaves turn yellow and drop on the rooting medium, making it inviting for diseases to get established. Often only a few chlorotic leaves near the tip of the cutting is all that remains after the rooted cutting has been removed from the propagating house.

The loss of plant nutrients through leaching of the foliage has been documented (1,2). Attempts to reduce this loss through the use of nutrient-mist (3) have been effective. However, nutrient mist encourages a lush growth of blue-green algae that covers the medium completely reducing aeration and drainage.

With the increased use of flats or trays as propagating containers, there is a tendency to leave cuttings under mist for longer periods than normal. This is done to insure a higher percentage of rooting, eliminating the need to re-stick unrooted cuttings. Such extended misting periods appear to reduce plant vigor as is evident by the chlorotic appearance of the rooted cuttings.

After cuttings have rooted, there is a tendency among nurserymen to neglect them with the assumption that newly-rooted cuttings will develop stronger and more extensive root systems. In reality, the first cuttings rooted develop heavy root systems, while the last cuttings to root remain weak or die because of competition from the more vigorous plants.

The purposes of these trials were to evaluate Osmocote 18-6-12 as a top-dressing on newly stuck azalea (*Rhododendron obtusum*) cuttings. Since there is a rather slow release of N, P, and K from Osmocote 18-6-12<sup>2</sup> for the first 45 days at 21.1°C (70°F), and a similar lapse of time between sticking and root initiation, a

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<sup>2</sup> Osmocote and technical information was supplied by the Sierra Chemical Company, 37650 Sycamore St., Newark, California 94560.

sufficient level of plant nutrients should be available in the propagating medium at the same time that new roots begin to initiate and grow.

### MATERIALS AND METHODS

All cuttings were taken in the morning from plants growing in a nursery field. The cuttings were immediately placed in plastic bags containing a moist paper towel, and the bags were packed in a portable ice-chest to keep them cool and to prevent the foliage from wilting. The plants were kept under refrigeration until they were prepared for sticking.

The cuttings were prepared for sticking by trimming them to a uniform length of 10 cm (4 inches) and removing the 2 bottom leaves. The base of each cutting was dipped in 0.1% IBA commercially-prepared rooting powder (Hormodin #1). All cuttings were stuck 2.5 cm (1 inch) deep, 2.5 cm apart, in rows 5 cm (2 inches) apart. The propagating medium used, unless otherwise stated, consisted of equal parts peatmoss and sand with 84 g (3 ounces) of dolomitic limestone, and 2.5 g ( $\frac{1}{4}$  level teaspoon) of fritted trace elements per 35.2 liters (1 bushel) of mix. All cuttings were rooted in wooden flats 7 cm (2.75 inches) deep. After all cuttings were stuck and treatments were applied, they were placed under mist timed for 6 sec every 3 min for the first 2 weeks followed by 6 sec every 6 min until all cuttings were rooted. The cuttings were misted from 8 a.m. to 6 p.m.

After all the cuttings had rooted, the flats were either placed in a well ventilated greenhouse or in a cold frame and watered only when necessary. In October, the rooted cuttings were transferred into a cool greenhouse and all flats not receiving any Osmocote were fertilized with a solution of 200 ppm of N from 25-10-10. During the winter months, the plants were watered only when necessary. In early March, each flat was visually evaluated on general appearance, color of foliage, root development, and branching.

### TREATMENTS AND RESULTS

**1971 Study.** Cuttings of *R. obtusum* 'Coral Bells', 'Delaware Valley White', 'Tradition', and 'Hershey Red' were taken on July 22 and stuck the following day. Immediately after sticking, the flats were top-dressed with Osmocote 18-6-12 at 0, 7, or 14 g per 0.093 m<sup>2</sup> (0,  $\frac{1}{4}$ ,  $\frac{1}{2}$  ounces per ft<sup>2</sup>), and placed under mist. All treatments were replicated twice.

In early March, when the treatments were evaluated, the plants that received no Osmocote were generally chlorotic and had lost most of their original leaves; most of the plants were flowering, and only a few were showing signs of branching. Their roots were well distributed throughout the propagating medium, but did not appear as vigorous as the roots in the other treatments.

The plants that were top-dressed with 7 g of Osmocote per 0.093 m<sup>2</sup> retained most of their original foliage and were dark green and attractive. Only a few plants were flowering and most were in active vegetative growth. The roots were generally white and well distributed throughout the medium.

The plants that received 14 g per 0.093 m<sup>2</sup> appeared to be of better quality than those receiving the 7 g level. The new growth appeared longer, the leaves were generally larger and more lush. Because none of the plants were flowering at the time of evaluation, the flower buds were examined and they appeared dead or in the process of dying. No attempt was made to determine the cause of death.

**1972 Study.** Because of the success achieved in 1971, it was decided to test Osmocote 18-6-12 on the direct sticking methods currently being used to produce liners from rooted cuttings. Cuttings of *R. obtusum* 'Delaware Valley White', 'Coral Bells', and 'Hershey Red' were stuck in either 3 cm (2¼ inch) peat pots filled with the propagating medium or in Jiffy-7 peat pellets on July 25. Both peat pots and peat pellets were packed tightly into separate wooden flats. After sticking, (one cutting per pot or pellet) the cuttings were top-dressed with 0, 7, or 14 g of Osmocote per 0.093 m<sup>2</sup> and placed under mist.

The results of the trials using the peat pots were similar to those of 1971. The plants that were not top-dressed at the time of sticking were chlorotic despite having received liquid fertilizer in October, and they were in full bloom. Most of the plants had lost their lower original leaves, and all that remained was a small cluster of leaves near the tip. However, several plants did show some signs of new vegetative growth. Their roots were well distributed throughout the root ball, but had not penetrated the walls of the peat pots.

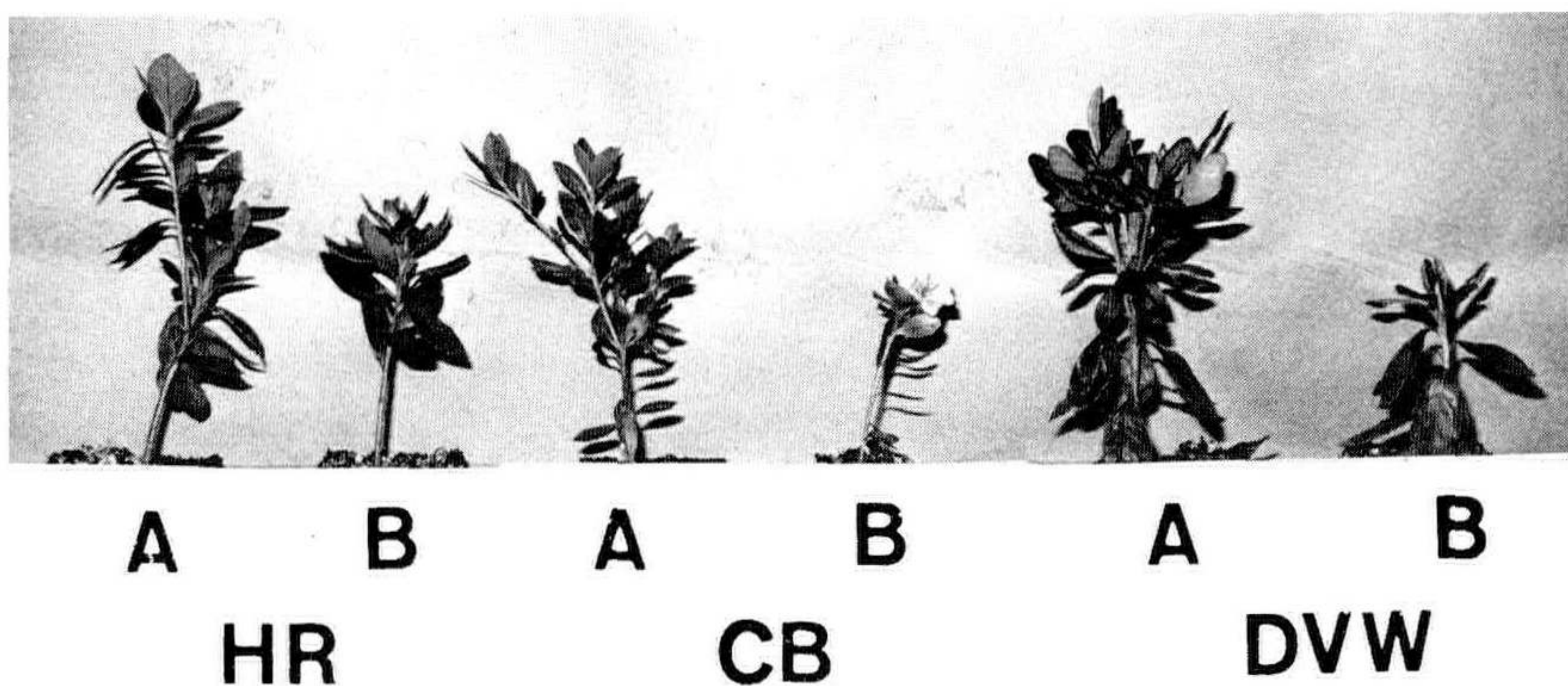
It was difficult distinguishing between the plants top-dressed with 7 g and 14 g per 0.093 m<sup>2</sup>. Plants in both treatments retained most of their original leaves and were in active vegetative growth. Only a few appeared to have flowered but many had dead flower buds. The root systems were well distributed throughout the soil ball and many of the roots had penetrated the walls of the peat pots.

Regardless of the treatment, most of the cuttings stuck in Jiffy-7 peat pellets were chlorotic and had lost most of their original lower leaves. The only treatment with a slightly better appearance was the plants that received liquid fertilizer in October. The poor success with Jiffy-7's appears to be due to its rounded shape. The Osmocote granules tend to roll off the top of the pellets and fall to the bottom of the flat. When moving the flats, the Osmocote falls through the cracks between the boards. When the plants were removed, only a few grains of Osmocote could be found.

**1974 Study.** Because of a reluctance by some nurserymen to apply Osmocote at the same time that the cuttings are stuck, a test was conducted to study the effects of a delayed application on the rooting and subsequent growth of *R. obtusum* 'Coral Bells', 'Delaware Valley White' and 'Hershey Red'. After sticking, 4 flats containing all 3 cultivars were immediately placed under the mist while 2 flats were top-dressed with 9 g per 0.093 m<sup>2</sup> of Osmocote and placed under the mist. On July 25, 22 days later, 2 of the untreated flats were top-dressed with 9 g per 0.093 m<sup>2</sup> while under the mist.

In mid-October the flats of rooted cuttings were evaluated, and transplanted. The flats that were top-dressed with Osmocote at sticking time appeared to have a more dense foliage than those plants top-dressed 22 days after sticking. The root systems of the plants of both treatments appeared to be of identical quality but superior to the plants that received no Osmocote. The roots of Osmocote-treated plants had active white root tips and the root mass appeared to be more dense than the gray looking roots of the plants that had not been top-dressed. (See Fig. 1).

There was little visual differences between individual plants top-dressed with Osmocote at sticking time or 22 days after sticking. Both treatments resulted in plants with well developed roots and actively growing tops. However, the plants that had not been top-dressed with Osmocote could easily be distinguished from the other treatments. These plants were beginning to flower, showed little evidence of active vegetative growth, and the root systems could easily be pulled apart.



**Figure 1.** Rooted cuttings of 'Hershey Red' (H.R.), 'Coral Bells' (C.B.), and Delaware Valley 'White' (D.V.W.), stuck on July 5, and photographed on October 30 — immediately after transplanting — showing differences in branching and new growth between cuttings: (A). Top-dressed with 9 g of Osmocote 18-6-12 per 0.093 m<sup>2</sup> (1/3 ounce/ft.<sup>2</sup>); (B). Stuck without top-dressing.

## CONCLUSION

Maintaining quality with a minimum amount of labor is of primary importance to the nurserymen. Monthly or bi-monthly fertilizing programs for rooted cuttings are often neglected especially during the busy digging and shipping season. A liquid fertilizer program requires accurate measuring of all materials by a qualified person, and to be successful it must be done at regular intervals. It appears evident from these studies that the propagation and subsequent feeding of *R. obtusum* 'Coral Bells', 'Delaware Valley White', 'Tradition' and 'Hershey Red' can successfully be accomplished in one or two separate operations. When using a porous propagating medium, such as peat and sand, Osmocote 18-6-12 at levels between 7 and 14 g per 0.093 m<sup>2</sup> applications immediately after sticking or after root initiation appear to be safe, as well as commercially feasible.

The system can be used safely in both direct sticking and high density sticking practices. The difficulties encountered with Jiffy-7 peat pellets could probably be corrected by filling the spaces between the pellets with either peat or sand before sticking the cuttings and the entire area top-dressed with the Osmocote.

The use of Osmocote offers the nurseryman the opportunity to stick the cuttings and fertilize at the same time, eliminating the problem of neglect. It guarantees the rooted cutting a sufficient supply of N, P, and K at each irrigation and allows the nurseryman to keep his rooted cuttings as wet or as dry as he desires.

## LITERATURE CITED

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CHARLIE PARKERSON: Thank you Francis; that was a very interesting paper.

Our next paper deals with propagating cuttings without mist and will be presented by Dr. Carl Whitcomb of Oklahoma State University.