

Automatic Watering of Begonias and Kalanchoes

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The production of geraniums, poinsettias and some other potted plants automatically watered by the constant water level method was described in New York State Flower Growers Bulletin #23. During the past season begonias and kalanchoes were grown to determine their response to automatic watering.

Begonias

Rooted leaf cuttings of Begonia Lady Mac were potted in 3 inch pots on April 24, shifted to 4 inch pots on June 23, and finally into 5 inch pots on September 18th; the night temperature was maintained at 60°F when possible. Because of lack of space, the plants were all surface watered until July 3; the plants were then surface watered, watered by injection, and constant water level. With the latter method pots were plunged 1/4 inch, one half the depth of the pot and to the rim. The water table was 1 and 2 inches below the pot for each treatment except those plunged 1/4 inch where the water table was 1 inch below the pot. There were 24 plants in 4 inch pots in each treatment; when shifted to 5 inch pots and spaced farther apart, the number was reduced to 15 plants.

One quarter inch of cinders was placed in the bottom of the pots in all treatments. In order to study the effect of drainage material on water movement twelve plants were potted with no drainage except a piece of crock over the drain hole and then pressed 1/4 inch into the sand with a constant water table 1 inch below the pots.

When the surface soil of any pot appeared dry, the plant was inverted and tapped lightly out of the pot; if the soil ball was dry, the plant was surface watered. One-third to one-half of the 12 plants plunged 1/4 inch and with cinder drainage in the pot required surface watering on 9 different days from July 22 to September 30, whereas only 3 of those without drainage needed a surface watering only on August 3. The cinder drainage in the pots pressed 1/4 inch into the sand interfered with water movement to the soil ball and many plants had to be surface watered. As soil gradually sifted down and roots penetrated the cinders, these plants no longer required surface watering. In the pots which were plunged one-half their depth or to the rim, the cinder drainage did not seriously interfere with the water supply because the water was able to move through the walls of the pot above the cinder layer. Only a few plants in these treatments required surface watering.

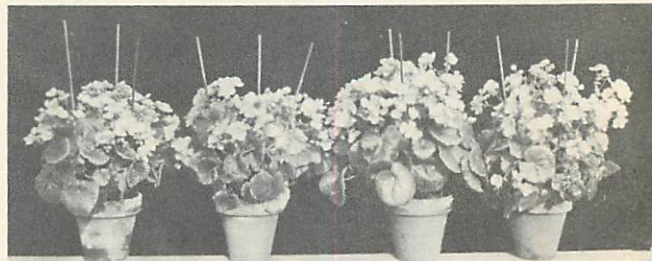


Figure 1. Begonias watered by each method. Left to right: surface watered; injection watered; constant water level 1 inch below pot (two to right), plunged to rim; plunged 1/4 inch, cinder drainage in pot.

The plants were surface watered to establish capillarity after they were shifted to 5-inch pots on September 18 and with the exception of plants with drainage and plunged 1/4 inch, no plants in any of the constant water level treatments received any further surface watering. The plants in all of the treatments were in full flower and excellent salable condition on November 25 with no difference between treatments. The size and flowering of all of the automatically watered plants were similar to the two plants on the right in Figure 1.

Roots were distributed depending on depth of plunging similar to those of the geraniums in Experiment 2.

Kalanchoes

Kalanchoe seed of the variety Tom Thumb were planted on February 21, and potted in 2-inch pots on April 3, and shifted to 3-inch pots on June 23. These plants were watered automatically by setting the pots on sand with a constant water table 1 inch below the pots. The plants were shifted to 4-inch pots on September 3 and given the same watering treatments as the begonias with 45 plants per treatment. They were grown at 60°F minimum night temperature. Black cloth treatment to produce short days was given from September 16 to October 10. The plants in all treatments were in full flower on December 20 with no difference in quality and growth between treatments (See Figures 2 and 3 showing plants photographed December 5). None of the plants required surface watering except for a few of the pots with drainage and plunged 1/4 inch. The root development of these plants was superior to the other treatments; plants plunged 1/2 the depth of the pot and those plunged to the rim with water 2 inches below the pots developed better roots than similar treatments with the water 1 inch below the

pots. Apparently Kalanchoe roots grow better with less soil moisture than many other plants; it may be that Kalanchoe roots require a higher oxygen supply for root growth.

Summary

Lady Mac begonias and kalanchoes were watered and grown successfully by the constant water level method, and were equal in quality to those which were surface watered or injection watered.

The recommended procedure for automatic watering of potted plants is to put the water conductor and gravel in the bottom of a level water-tight bench and level the gravel in water. Put one inch of sand on the gravel. Use only a piece of "crock" or nothing over the drainage hole when potting the plants. Place the potted plants on the sand pressing the pots lightly into the sand about 1/4 to 1/2 inch to get good contact between sand and pot. Surface water the soil to establish capillarity. Establish a constant water level 1 inch below the bottom of the pot. If the plants do not obtain sufficient water automatically, add more sand and plunge the pots. If the soil remains too wet causing reduction of the oxygen supply, lower the water table. The water table should not contact the bottom of the pot. Because of the labor involved in plunging pots and spacing plunged pots, it is most economical to plunge the pots as little as possible and still have automatic watering.



Figure 2. Kalanchoes watered by each method. Left to right: surface watered; injection watered; constant water level inch below pot (two to right), plunged to rim; plunged 1/4 inch.



Figure 3. Kalanchoes watered by constant water level. Left to right: plunged to rim; plunged 1 1/2 inches; plunged 1/4 inch, all with water table 1 inch below pot; plunged to rim, plunged 1 1/2 inches, both with water table 2 inches below pot.
