HYDROGEL OR CALCINED CLAY

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Soil components that absorb water when it is freely available, then release it when the plant needs it, have a great potential value for potted crops. They reduce watering frequency and provide some insurance against accidental neglect.

A polymeric material, VITERRA^{R} Hydrogel,* has been advertised as an efficacious soil additive for water control. The recommended rate is 14 lbs. per cubic yard. Another material that has similar properties, although of much different composition, is calcined clay (Turface, used in this experiment, or LuSoil). It is recommended at 1/3 by volume in the soil mix. A third material is a chemical grout (AM-9)** used in soil stabilization. This polymerized, dried and milled polyacrylimide formulation was added at 20 lbs. per cubic yard. It is more expensive than hydrogel.

Procedure

The treatments were as follows:

1. Control, 1(composted soil):1(sphagnum peat):1(sand).
2. 1:1:1 plus 14 lbs./cu. yd. hydrogel.
3. 1:1:1 plus 20 lbs./cu. yd. hydrogel.
4. 1:1:1 plus 30 lbs./cu. yd. hydrogel.
5. 1:1:1 plus 20 lbs./cu. yd. AM-9
6. 1:1:1T(Turface).
7. 1:1:1T plus 20 lbs./cu. yd. VITERRA^{R} Hydrogel.

*Supplied through courtesy of Union Carbide Corp.
**Supplied through courtesy of American Cyanamide Corporation.

Into these mixes, in triplicate or quadruplicate, were planted African marigold seedlings in peat pots or chrysanthemum 'Yellow Mandalay'*** rooted cuttings in 4" plastic pots. The marigolds were grown 14 or 26 days before withholding water, the chrysanthemums 26 days.

Results

The Hydrogel at 14 lbs./cu. yd., the recommended rate, was somewhat better than the 1:1:1 control. This does not preclude the premise that the material would be more effective when incorporated into a less ideal potting soil (Figures 1 and 2).

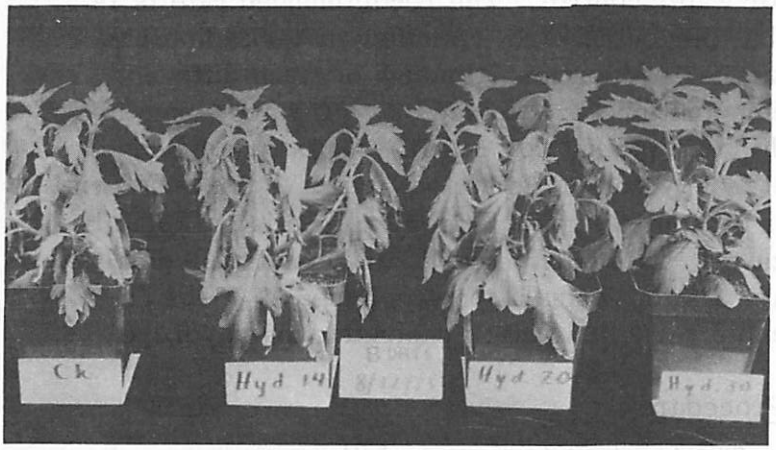

Figure 1. Chrysanthemum 'Yellow Mandalay' grown in 1:1:1 soil-peat-sand mix to which was added 0 (on left), 14, 20 or 30 lbs./cu. yd. VITERRA^{R} Hydrogel. Water was withheld for 8 days prior to the picture. The wilting was progressively less as the rate increased. In other trials, wilting occurred in less time when the temperatures were higher.

***Supplied through courtesy of Stafford Conservatories, Stafford Springs, Connecticut.

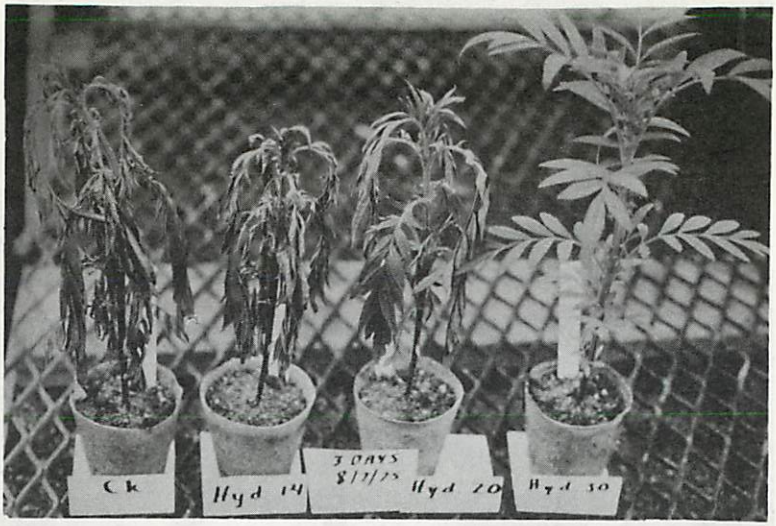

Figure 2. African marigolds grown in the same treatments as in Figure 1. Wilting was severe in 3 days except at the 30 lb. rate.

At 20 lbs. hydrogel, resistance to wilting was little better than at the 14 lbs. rate, just noticeably better than 1:1:1.

At 30 lbs. hydrogel, a marked resistance to wilting was achieved.

AM-9 was as effective as the hydrogel (Figure 3).

The substitution of calcined clay for the sand in the soil mix provided a level of resistance to wilting in the same order as the 20 lb. rate of hydrogel. Adding 20 lbs./cu. yd. hydrogel to the 1:1:1T did not provide further resistance to wilting.

Summary

Based on an average of 484 6" pots per cubic yard and a price of $2.25 per lb. for VITERRA^{R} Hydrogel, the cost is $31.50/cu. yd. or 6.5¢ per pot at the 14 lb. rate ($67.50/cu. yd.; 13.9¢/6" pot at the 30 lb. rate).

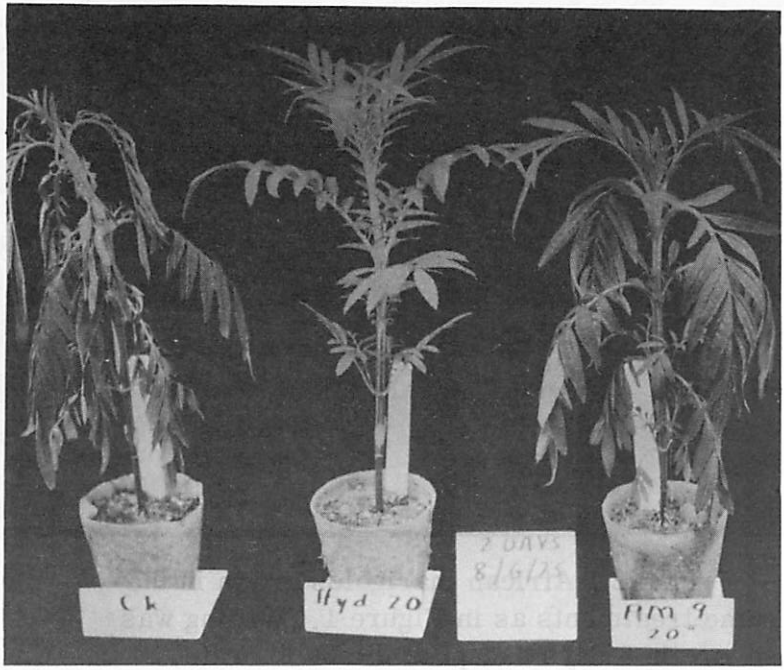

Figure 3. African marigolds grown in 1:1:1 soil mix with 20 lbs. of VITERRA^{R} Hydrogel or AM-9. Although AM-9 is as effective in reducing wilting, its higher cost would seem to preclude its use.

This may be compared to a cost of $31.20 per cubic yard of mix for calcined clay (LuSoil at $4.95/50 lb. bag) less the cost of the sand displaced (say $2.00 or less) giving a cost of 6.0¢ per 6" azalea pot.

In conclusion, the costs of hydrogel and calcined clay are similar, as are the results. Further testing is necessary, especially in less favorable soil mixes, before a choice may be made. Either treatment is advantageous and should be considered for soils where watering may be less than optimal, especially in hanging pots.