

New Growing Aids for Magnolias

by Robert W. Adams

The summer of 1983 scorched the midwestern United States with unremitting 90° to 106° F. temperatures. The total accumulation of rain in most of the area did not exceed three inches from July through September. By the end of August most nurseries had row after row of stock defoliated to defend against the unceasing drouth.

To add further trauma to the weakened plant tissue of my seedling Magnolias, winter marched out of Canada in early December with true Zone 4 temperatures for our 6A climate. The weathermen (who had only days before predicted an exceptionally mild winter) explained that the jetstream had taken a sudden dip into the Central United States. Whatever the cause, the temperature dropped to -12° F. by the second week of December in central Indiana. There were eight days with a minimum below 0° F. before Christmas. My wood chip pile was frozen into a massive block before the first Magnolia had been decently mulched.

Despite the harsh weather, I have hope that some new plant products may carry me through until the spring of 1984. Three products—super absorbents, foliar micronutrient fertilizers and foam blankets—have already proved of value to me.

Super Absorbents. The generic term "super absorbent" describes the starch material originated by the USDA Research Station in Peoria, Illinois. The basic advantage of the product is that, depending upon the formulation, it retains 200 to over 5,000 times its weight in water for one to two growing seasons.

I mixed a small amount of super absorbent in the soil for most of the seedlings set out in June, as well as

transplanted stock. The results were dramatic. Even with the drouth conditions, the seedling Magnolias required watering only once every ten days to two weeks. The super absorbent tenaciously held the water and refused to give it up by absorption to the surrounding soil or by evaporation to the air.

An added bonus is that fertilizers are held in the root-zone and not leached through as with frequent watering. The absorbent also promotes soil aeration by expanding the air space between the soil particles. It stores indefinitely if kept in a tightly-sealed container.

Unlike many additives, the absorbents are neutral and do not affect pH. I noted that the Magnolias, Hollies and Rhododendrons on which the absorbent was used seemed less affected by the summer drouth than those without the absorbent. They maintained a more vigorous green growth throughout the summer. I suspect that the plants with the absorbent did not suffer from the salt build-up that accompanies frequent watering from wells or treated water sources.

The absorbent disintegrates in about a year, but the effective duration varies with the number of waterings and the particular formulation by the manufacturer. There are numerous suppliers now, due to the demand in all sectors of the horticultural industry. Some manufacturers produce several formulations, such as for indoor and outdoor applications. Some of the trade names are Viterra 2, Aqua Stor, Liqua-Gel, and even the self-descriptive "Super Slurper."

Nurserymen are using the absorbents for other purposes than merely adding it to a soil mixture. Bare-root plants are dipped into a thin slurry made with a small amount of absorbent for

shipping and to reduce transplant shock. Seeds are coated with an absorbent formulation to provide even moisture control during germination.

Perhaps the only admonition is to avoid using absorbents in rooting mediums; the water may easily be pulled out of the cutting by the absorbent. Also, I have not yet observed how the absorbents work with the standard wetting agents, such as Aqua-Gro.

I purchased a three-pound bag of the absorbent called Aqua-Gel for \$19.85 from F.C. Geiger Supply Company (Telephone, toll-free 800-443-4437). A little absorbent goes a long way, so a small grower should probably plan to split this amount with a friend.

Foliar Micronutrient Fertilizers. The second product which sustained my magnolias and other young plants in the drouth is a fertilizer which has been praised in previous articles in *MAGNOLIA* by the eminently readable Sir Peter Smithers. KeyPlex is one of a growing number of foliar micronutrient fertilizers. It is produced by Morse Enterprises Limited, Suite 301, 7800 Red Road, South Miami, Florida, 33143.

After reading how Smithers achieved impressive results by weekly spray applications of KeyPlex on his "balky" Magnolias, I wrote to Morse Enterprises for information. The owner of the company, Dante Brunetti, responded immediately and expressed incredulity that his product was being used for Magnolias. He sells KeyPlex primarily for use on citrus fruits in the Florida area, where micronutrient fertilizers are a necessity for the sandy soil. Mr. Brunetti was extremely cooperative and provided detailed information on the application of KeyPlex as well as test data from the University of Florida.

He described KeyPlex as a chelated metals complex combined with a biostimulant (alpha keto acids). The analysis contains magnesium,

manganese, zinc, copper, iron, boron, molybdenum and sulphur.

I applied KeyPlex to Magnolias, Hollies, and Rhododendrons in the torrid summer heat once every 14 days from mid-June through the first week of August. To my surprise, the plants responded in the intense heat by throwing up a continual flush of healthy growth. The effect was much more dramatic in plants which had been fertilized with KeyPlex the previous year. After the first year, I noted extremely large, well-developed root systems.

Mr. Brunetti confirmed that KeyPlex decreases heat stress in plants, in addition to stimulating growth. He emphasized that the fertilizer will not penetrate the leaf tissue well unless a penetrant is added to the spray. The best penetrant is magnesium nitrate, but I found it difficult to locate and expensive. The second best is potassium nitrate, which should be the standard or spray grade 13-0-44. The third best penetrant is urea. All three of the recommended penetrants are mixed at two to five pounds per 100 gallons of water.

KeyPlex is completely miscible with water, unlike other micronutrient sprays I used a number of years ago. I believe it is best to discontinue the spray application in early August to enable the plants to harden off.

The only problem I encountered in application was in matching the spray to the texture of the Magnolia leaf. *M. kobus* has a coarse leaf and the spray easily adheres to it. However, *M. grandiflora* and *M. virginiana* are smooth leaved and require adding a lot more spreader-sticker to the spray mixture. After much frustration with wasted spray, I simply started spraying the *M. kobus* and other coarse-leaved plants first. Then I added a liberal amount of spreader-sticker to the mixture and finished up on the hard-to-wet magnolias and Ilex.

KeyPlex is mixed at the ratio of

about two pints to 20 gallons of water. Thus, the small grower does not need more than one to two gallons for his own use. It is available in five-gallon pails at \$15.50 per gallon F.O.B. Florida.

In 1983, the Peters Fertilizer Company, one of the largest and most reputable manufacturers in the United States, came out with its own foliar micronutrient fertilizer with N, P and K added. The Peters Company claims spectacular results with its product, in much the same manner as Smithers found with KeyPlex.

Foam Blankets. The unique problems for the plantsman, which began in the early 1970's, were continued in the winter of 1983. Nurserymen were confronted with a rapid increase in labor costs. Out of necessity, they turned to raising stock in containers. Just as the problems of container growing began to be resolved, the energy crisis of the mid-1970's and the cold winters of 1976 to 1978 struck devastating blows to the nursery trade.

Most plants, particularly the genus *Magnolia*, are not as root hardy in containers as they are when planted in the ground. Tests have shown that *M. × soulangiana* will root kill at 23°F. in an unprotected container. Unheated greenhouses do not provide enough protection for Zone 7 and colder areas. Heated greenhouses are simply too costly for the colder zones of the United States.

The innovative plantsman, Francis Gouin, of the University of Maryland began to experiment in the mid-1970's with a packing material from the DuPont Company called Microfoam. He found that container stock could be overwintered by securely covering them with the foam blanket. Amazingly, most species of plants came through the winter in excellent condition.

Low spreading plants should be grouped tightly together. Taller plants are packed on their sides in a single

layer, but with the branches of each plant laid on or between adjacent containers in an interwoven manner.

A few refinements have been made in the foam blanket technology since the discovery of the concept. Now the one-quarter-inch foam blanket is generally sandwiched between two layers of white four- or six-mil. white polyethylene. The edges are buried under several inches of soil. The plants are also thoroughly watered and sprayed with a fungicide before covering. A good rodent poison should be scattered among the plants. On warm winter days the blanket is lifted to prevent overheating.

An excellent compilation of the literature on foam blankets is contained in an article by Robert E. McNiel and George A. Duncan in the December 1, 1983 issue of *American Nurseryman*, p. 94.

There are other uses of the foam blanket. It serves as an excellent insulation for covering cold frames to preserve ground heat in winter. Greenhouse owners use it to cover north walls and as a heat retention curtain.

I plan to use the foam blanket to protect magnolia blooms from the late frosts which seem to afflict so many fine plants in the Sections Yulania and Buergeria.

DuPont has sold its Microfoam division to Ametec, 265 Route 202, Chadds Ford, Pennsylvania, 19317. At least two other competing foam blankets have come on the market, Guilfoam and Plant-Foam. I prefer these two newer products because their width is 80 inches as compared to 72 inches for Microfoam.

Guilfoam is also available with white polyethylene treated with ultra-violet ray inhibitor and bonded on one side of the foam blanket. It is called Guilbond in this form. The cost for a 250 foot roll of foam should be about \$130.00. The same length of blanket bonded with poly should be about

\$185.00. One roll is much more than the small grower will likely need.

For those persons who prefer some technical data, Microfoam is a closed-cell polypropylene, and Guilfoam and Plant-Foam are closed-cell polyethylene foams. All three come in varying thicknesses, but the one-quarter inch is the thickest and the one most widely used for horticulture purposes. None of the foam blankets absorbs water. The effective life is about three years, and probably longer if they are treated with care. The blanket should be dried before rolling up for storage. The foam blanket should be protected from daylight by black plastic when it is stored. To keep the blanket from being lifted by the wind it is securely tied with ropes or other soft material, which are then anchored with used automobile tires.

There is one handling problem with the foam blankets that should be anticipated. Although lightweight, a roll of the foam is bulky and, therefore, costly to ship. It is best to pick it up yourself from a local supplier in a pick-up truck or larger vehicle. A standard station wagon will not hold a 250 foot roll.

Other Products. A very handy product for plant protection comes from my home state of Indiana. Keystone Consolidated Industries makes a poultry wire laminated with polyethylene. It comes in 36- and 72-inch width and lengths of 25 or 100 feet. The address of the company is 510 South Oak Street, Crawfordville, Indiana 47933.

Our editor, Harold Hopkins, suggested I mention Parafilm made by the American Can Company. In a short time, this somewhat adhesive, expandable film has become widely used for grafting applications. My grafting experience is limited to the lore which Joseph Hickman, of Benton, Illinois taught me in the spring of 1982 and that derived from prodigious reading.

Some large growers use Parafilm exclusively for all of their budding. The

film comes in long rolls or strips. The desired length is stretched until it is about twice its original length. Then the stretched film is wound twice around the budded scion. The film is not removed. As the bud expands, it breaks through the film with little effort.

Parafilm is difficult to order in small quantities. However, I purchased a 2-inch by five-foot strip for \$1.00 postpaid from Alexander Pal, Sandor's Research Nursery, 1146 East Plymouth Road, Ashtabula, Ohio 44004.

American Can Co., Greenwich, Connecticut 06830, maker of Parafilm M, reports it's stocked by the following distributor firms (main offices shown), which have numerous branches in most major cities: American Scientific Products, 1210 Waukegan Road, McGaw Park, Waukegan, Illinois 60085; Fisher Scientific Co., 711 Forbes Street, Pittsburgh, Pennsylvania 15219; VWR Scientific Inc., 3745 Bayshore Road, Brisbane, California 94005; Curtin-Matheson Scientific Inc., 4220 Jefferson Avenue, Houston, Texas 77001; Arthur H. Thomas Co., Vine at 3rd, Philadelphia, Pennsylvania 19106; Sargent-Welch Scientific Co., 7300 N. Linder Avenue, Skokie, Illinois 60076. A roll 2 inches by 250 feet should sell for around \$12.50, enough to last a home grafter for years, but you may be required to buy a minimum number of rolls. American Can produces an illustrated brochure showing how the product is used in grafting.

Two effective fungicides have recently been introduced, which I have used for only a short time. Aliette by the Rhone-Poulenc Company is a new and most effective systemic fungicide for phytophthora and downy mildew. It is absorbed by the leaves of the plant as well as through the roots. Topsin M by the Penn Walt Chemical Company is an excellent general systemic spray similar to Benomyl, but with a broader spectrum of control.

My final favorite new product is the growth retardant, Atrinal, made by the