each one of them is based on our findings from field scouting. Currently, we do not rely on pheromore traps or yellow sticky cards for pest detection. We must scout all areas of our nursery for all plant pests continuously since we grow many different kinds of plants and we feel these "state of the art" methods would not serve us well.

Pest management in Monrovia's propagation department is a varied and complex part of our business. Prevention is the real key to our success and is achieved by sanitation, field scouting, and preventative programs.

A COMPARISON OF THE PROPERTIES OF SLOW-RELEASE FERTILIZERS IN CONTAINER PLANT PRODUCTION

GEORGE SCHMITZ

California Polytechnic State University
3801 West Temple Avenue
Pomona, California 91768

The subject to be presented today has been very effectively summarized in two recent publications: Wise Fertilizer Selection and Application Enhance Container Success (1) and the very recent book, Fertilizer Technology and Use (2).

Slow-release fertilizers can be placed in two categories: slowly degraded, and coated.

Some fertilizers that degrade slowly release nutrients gradually because the fertilizer formulation has low solubility; IBDU is an example. Others, such as urea-formaldehyde, degrade slowly because they require microbial activity to release the nutrients. Most fertilizers in the slowly degraded group are formulated to last effectively for 8 to 12 weeks and are usually surfaced-applied.

The other group of slow-release fertilizers, coated materials, contains soluble fertilizers encapsulated with either sulfur or resin. Typically, they are formulated to release nutrients for 3 to 12 months and vary in type, quality, longevity, and cost.

Sulfur-coated fertilizers contain soluble components coated with sulfur, a soft wax sealant, and a microbicide. The sealant slows the transfer of water vapor to the soluble components, thus delaying nutrient release. The microbicide slows the rate of sealant

decomposition. Decomposition and release rates are influenced by the thickness and uniformity of the sulfur coating and the rate of microbial activity.

Resin-coated products compose the second type of coated fertilizers. With this type, a plastic polymer coating encapsulates the soluble fertilizers. When the medium is wet, moisture diffuses into the prill (fertilizer pellet) and dissolves the fertilizers, which slowly diffuse into the growth medium. In a moist environment, the release rate is controlled by coating thickness, coating type, and ambient temperature.

Coated fertilizers offer the greatest flexibility in nutrient longevity and application methods. Ideally, a slow-release fertilizer needs to be applied only once, and nutrients will be metered throughout the production cycle. While this objective can be successfully achieved with many nursery crops, the development of such a fertilizer program should be based on a thorough knowledge of crop scheduling and available fertilizer products.

Table 1 outlines various characteristics of certain controlled-release fertilizers.

Table 1. Characteristics of some common controlled-release fertilizers*

Control method	Material	Availability of N increase with:	Period of effectiveness
Biological degradation	Animal manures	Temperature, moisture, pH near 7	2 to 4 weeks
	Sewage sludge		2 to 4 months
	Hoof and horn *meal*		
Low solubility and biodegradation	Ureaform	Temperature, moisture, pH near 7	Variable, averaging 0.4% per day
Coated soluble materials	Osmocote	Temperature	Variable, 3 to 9 mo.
	SCU	Temperature and *moisture*	Variable, approximately 1% per day
Low solubility	IBDU	Exposed surface, soil moisture and acidity to pH 4	3% per week for 1 mm particles
	MagAmp	Moisture and acidity	100 days for coarse granules
Nitrification inhibitor	Nitropyrin	Soil organic matter and temperature	2 to 10 weeks
Urease inhibitor	None recommended	Temperature and other factors	———

*Adapted from Maynard and Lorenz (1979) and Hauck and Koshino (1971).

LITERATURE CITED

1. Cobb, Gary S. 1986. Wise fertilizer selection and application enhance container success. *Amer. Nurs.* Feb. 15, 1986.
2. Hauck, Roland D. 1985. Fertilizer Technology and Use, (3rd ed.). Soil Science Soc. of America, Madison, Wis.