

**Raising nitrogen levels.** Three different sludge concentrations—low, medium and high—were applied to a plot of trees at the Central Maryland Research and Educational Center in Clarksville.

Nitrogen increased slightly in the soil water containing low sludge concentrations and returned to normal after a short time.

The medium and high concentrations resulted in soil water with nitrogen levels well above acceptable levels. The nitrogen levels remained above normal after two years.

To be considered useful, research has to be able to predict nitrogen leakage under worst-case conditions.

These include instances where nitrogen is not being cycled into the ecosystem, leaving more to leach into the

groundwater.

Maryland experienced this worst-case scenario with its two-year drought in 1986 and 1987, where rainfall was half that of normal, says McIntosh, which may have caused the lack of growth as well as the varied results in nitrogen

Nitrate leaching into groundwater is the limiting factor for applying sludge to forest lands.

leaching. When water is scarce—as in a drought—two things can happen: plants do not take up as much nitrogen and denitrification—the process by which nitrogen is released into the atmosphere

as nitrogen gas, and occurs only under waterlogged conditions—does not occur.

The sludge was applied at a rate of 714 lbs./acre, twice the medium of 357 lbs. Leaching levels, however, were about the same for both rates.

McIntosh suggests that under more rainy conditions, leaching might not occur or might not be as high.

Nitrate leaching into the ground water is the limiting factor for applying sludge to forest land.

McIntosh says nitrogen levels must be watched closely, and be allowed to return to baseline levels before re-applying.

Sludge application on farmland is highly regulated, but no regulations exist for forest lands, according to McIntosh, who hopes her research findings will help establish such guidelines.

## AgriDyne seeks foreign markets for neem

**SALT LAKE CITY**—AgriDyne Technologies, Inc. announced recently that it had filed foreign registration applications for its neem-based bioinsecticides.

The applications were filed in Italy, France, Spain and the Netherlands, as well as 14 Latin American countries, including Mexico.

AgriDyne has requested marketing clearance for three bioinsecticides:

- Azatin, for non-food crop application in the nursery and ornamental markets;
- Turplex, for lawn and turf application;
- Align, for food crop application.

The active ingredient for each bioinsecticide is azadirachtin, a natural insect growth regulator extracted from the seed of neem trees. Found in more than 50 countries worldwide, the tropical neem tree has long been recognized for its natural insecticidal properties.

AgriDyne received marketing clearance from the U.S. Environmental Protection Agency (EPA) for Azatin and Turplex in January 1992, and anticipates EPA registration for Align in 1993.

“The four European countries represent a significant portion of the

European market for insecticides,” says Eric B. Hale, AgriDyne president and chief executive officer.

“Additionally, they are some of the more environmentally progressive nations in Europe.

“These foreign registration filings are part of our on-going strategy to broaden the market and grow our revenue stream, for our family of bioinsecticides.”

AgriDyne had previously received marketing clearance for its neem-based bioinsecticides from the Dominican Republic.

## Biosys buys AgriSense

**PALO ALTO, Calif.**—Biosys announced recently it had acquired AgriSense, a Delaware general partnership.

The acquisition includes the wholly-owned AgriSense European subsidiary, Biological Control Systems and the U.S. operations headquartered in Fresno, Calif.

Both divisions of AgriSense develop and market pheromone-based products for detection and monitoring of cockroaches and insect pests in high value crops and stored products. Other product and technologies include those that disrupt the mating of insect pests which attack rice and cotton crops.

AgriSense was sold for \$3.5 million in cash and 400,000 shares of biosys common stock. Additional shares may be issued under “certain circumstances.”

AgriSense is commercializing products based on Phillips Petroleum’s pheromone

synthesis technology and Dow Corning’s micro-encapsulation/slow release technology developed for pheromone traps and lure applications.

The product range provides for non-toxic, environmentally compatible detection, monitoring and control of insects in agricultural fields and orchards as well as in residential and industrial sites. Integrated pest management regimes which minimize the use of chemical pesticides are made more effective through the use of such monitoring techniques which assist in timing and in minimizing the application of pesticides.