

# WHAT PESTS COST FLORIDIANS

**and why biological pest control is a good investment opportunity**

By Darcy Meeker

GAINESVILLE — Insects, weeds, nematodes and plant diseases cost Floridians about \$250 per year per person.

The \$2.5 billion yearly tab for pest damage and pest control in Florida amounts to nearly two cents out of every dollar of personal income in the sunshine state.

It's an indirect cost of living that we all pay when we buy food, when we take our families to tourist parks, when we

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**OUR GREATEST HOPE FOR IMPROVING THE ECONOMICS OF AGRICULTURE IN THE NEAR FUTURE LIES IN DEVELOPING MORE BIOLOGICAL CONTROLS OF PESTS AND DISEASES.**

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play golf, when we buy gasoline for our cars . . . .

People use pesticides because they net an immediate economic return, estimated to be \$3 to \$5 per \$1 spent on the chemical agents and their distribution.

Biological control of pests — engineering an ecology favorable for the plants and animals we want to cultivate — is an attractive addition to the pest control arsenal. Per \$1 invested, biocontrol returns an estimated \$26 in benefits over five years, \$30 over ten. Equally attractive is the fact that the solutions are often permanent, often self-distributing, and frequently one-time costs.

Says Dr. K.R. Tefertiller, head of the statewide Institute of Food and Agricultural Sciences (IFAS): "Our greatest hope for improving the economics of agriculture in the near future lies in developing more biological controls of pests and diseases."

Consider what we spend now.

**INSECTS:** Damage and control cost Floridians \$1.3 billion a year. Figures from the Entomological Society of America break it down:

- \$386 million, termites;
- \$230 million, cockroaches;
- \$ 85 million, citrus rust mite;
- \$ 64 million, hornfly (a pest to cattle);
- \$ 57 million, mosquitoes;
- \$ 50 million, ornamental scale;
- \$ 45 million, fleas;
- \$ 37 million, mole crickets;
- and many other millions on other pests as well.

**PLANT DISEASES:** Annual crop loss to Florida's assorted rots, wilts, blights, rusts, mosaics, spots and smuts is about \$450 million and control costs about \$210 million, totalling \$660 million. Crops hardest hit include citrus, sugarcane, and vegetables.

**WEEDS:** Damage and control cost Floridians \$360 million, depending on cost of gasoline and herbicides. The top enemies: Hydrilla is number one and others in the top five are smutgrass, a pest on pastures, golf courses and lawns; sickle pod, a tall bean that makes harvesting difficult in row crops; and melaleuca (punk tree) and Brazilian pepper tree.

**NEMATODES:** IFAS Extension nematologist Bob Dunn says these microscopic worms cost Florida:

- \$63.9 million, in the citrus industry;
- \$ 6.7 million, potatoes, in the Hastings area alone;
- \$ 5.1 million, golf turf;
- \$ 4.4 million, soybeans;
- \$ 1.2 million, tobacco.

Those costs take us up to the \$90 million mark for nematodes, but it's hard to say how much the soil-borne pests cost us over all. Nematodes are fought with soil fumi-

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gants which also combat fungi and several other enemies at the same time.

Pests also contributed to cost we all pay with our money and our concern: \$3.1 million already appropriated by Florida legislators to clean up wells known to be contaminated by EDB, which had been the main nematicide.

Some costs of pest control are hidden. For example, while our soil fumigation has been killing off the root-knot and sting and other enemy nematodes, we have also been killing off their enemies: fungi, other nematodes and bacteria. Likewise the use of pesticides in our citrus groves and tomato fields and landscapes. Possibly even in our homes. While fighting pests, we have sometimes made our pest problems worse.

However, with the addition of biological pest control to our pest control tool kit, we can seize the opportunity to rebuild the invisible ecology of living soil according to our desires, to structure the ecology of our landscape, to re-engineer the setting of our lives and of our food production — so long as we play by nature's rules. ■

## NEMATODE NEMESIS

The nematode may be brought to heel by an extract of crab shells.

Nematodes are tiny parasitic worms that dwell in the soil and cause an estimated \$3 billion of damage a year to

crops and gardens. Unlike other soil microbes, the nematode larvae contain a complex sugar called chiten, explains Robert Milch, the president of Igene Biotechnology Inc. in Columbia, Md. If extraneous chiten is mixed in the soil, it will trigger other soil microbes to produce an enzyme that destroys it. Thus, mixing chiten with soil sets off a kind of chemical warfare that destroys nematode larvae.

## THE PROTEIN SPURS THE GROWTH OF FUNGI AND OTHER MICROBES THOUGHT TO ATTACK ADULT NEMATODES.

Crab, oyster and clam shells are rich in chiten and Igene has found an inexpensive way to extract it, Dr. Milch says. After extracting residual meat from crab-shell wastes to produce a flavoring compound, Igene dissolves away the calcium with an acid. This leaves a chiten-and-protein mix that Igene has turned into a product it calls ClandoSan. The protein spurs the growth of fungi and other microbes thought to attack adult nematodes.

Igene plans to market ClandoSan later this year, after tests of its effectiveness are completed at Auburn University in Alabama and Hebrew University in Israel. Since chiten is a natural pesticide, formal federal approval may not be needed for ClandoSan, Mr. Milch says. Igene notes that most synthetic chemicals formerly used against nematodes have been banned because of environmental problems. ■



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