

# Japanese beetle repellent discovered

WASHINGTON, D.C. — Japanese beetles will starve before they will eat some plants treated with extracts of the seed from the East Indian neem tree. Three years of research at Wooster, Ohio, has shown good protection of soybean plants by spraying with neem seed extracts.

"Seeds of the tree have long been reputed to repel insects and deter them from feeding," says Thyril L. Ladd, entomologist and research leader of SEA's Japanese Beetle Research Laboratory at Wooster. "So, we decided to examine extracts of the seeds to determine whether they affect feeding of Japanese beetles."

Japanese beetles are known to feed on about 300 different plants including

grapes, roses, birch, elm, rhubarb, and even poison ivy. The grub stage lives in the soil and loves good turf, where it consumes the roots, reducing growth—and even killing the grass in severe cases. Turf is especially susceptible to beetle damage in dry weather, Dr. Ladd says.

The beetles are slowly spreading from their present range which runs from southeastern Canada to Georgia and from Delaware to Missouri.

Using sassafras foliage as the test material, SEA scientists tried three different extracts from the neem seed in 1975. They tested five concentrations of each extract, ranging from 0.25 to 10 per cent, which were applied to one-half of the leaf. The leaves were

then placed in containers with 25 beetles. In an additional test, entire leaves were treated and placed in pots without a supply of untreated leaves for the beetles.

"When leaves were checked 24 to 48 hours later, the treatment showed excellent results," Dr. Ladd said. Untreated leaf halves were completely consumed except for veins. Treated leaf halves were practically untouched. Only the leaves receiving the lowest concentrations showed slight indications of feeding.

"When beetles were offered only treated leaves, we found occasional small scars on the leaf surfaces," Dr. Ladd said. "Some beetles died rather than consume the treated sassafras leaves."

Because of the successful results, both laboratory and field tests were conducted in 1976 using soybeans. The tests were designed to evaluate the residual effects of the neem seed extracts on beetle feeding.

Beeson variety soybeans were sprayed in the field and leaves were picked and placed in pots in the laboratory with 40 beetles at various intervals over a 17-day period. The leaves were checked for damage after 24 hours.

Beetles rapidly destroyed untreated foliage, Dr. Ladd said, while neem-treated leaflets collected 3 days after treatment remained

undamaged. Those collected 12 days after treatment suffered only slight damage, and those tested at 17 days showed only moderate feeding.

Other treated plants were left in the field and checked for damage. Repellency was still protecting the plants 14 days after treatment in the midst of heavily damaged, untreated soybean plants, Dr. Ladd said.

In 1977, the third year of tests, randomly selected plants were treated in the field on a 3- or 7-day schedule. Baits were used to attract beetles to the area. Beetle counts were made on the plants each day and feeding damage was evaluated at the end of the test.

The differences in feeding on neem-treated plants and untreated plants were striking, Dr. Ladd said. Thirty-six times as many beetles were counted on untreated plants as were found on those sprayed on the 3-day schedule with neem extract. Part of the test had to be terminated after 9 days even though plants treated on the 3-day schedule were relatively untouched because the untreated plants were destroyed.

"Our studies show that extracts of neem seeds are uniquely effective as a deterrent to Japanese beetle feeding," Dr. Ladd said. "Since other research has

shown these extracts to deter other insect pests, they may be useful in a number of pest management systems."

"We are looking at a variety of approaches to the Japanese beetle problem," Dr. Ladd said. "The neem seed extract looks good so far. It is a natural material and, hopefully, should not be a hazard to the environment."

Research chemist Martin Jacobson, chief of USDA's Biologically Active Natural Products Laboratory, Beltsville, Md., cooperated with Dr. Ladd on the project. Research technician Charles R. Buriff also worked with Dr. Ladd at Wooster. The

Beltsville laboratory is continuing its cooperation by isolating the active compounds and providing these to Dr. Ladd for evaluation.

Jacobson says the neem tree is a commercially grown crop in India where the seed oil is used in medications and as fuel in lamps, as well as for repelling insects. For example, in India, the seeds are commonly mixed with grain in storage to keep insects out.

Dr. Thyril L. Ladd, Jr., is with the Japanese Beetle Laboratory, Ohio Agricultural Research and Development Center, Wooster, Ohio 44691.

## Hallowell addresses township supervisors

HERSHEY — Secretary of Agriculture Penrose Hallowell announced the appointment of John M. Drake, Blair County, as a regional director in the Department's Allentown office. Drake serves as the president of the Pennsylvania State Association of Township Supervisors.

Hallowell addressed the Pennsylvania State Association of Township Supervisors at their 57th Annual Convention held in Hershey, April 25.

Hallowell stated that so far, farmland has tax wise supported land development. "If we are going to see more farm land preserved" he said, "we are going to have to plan for development as well."

Hallowell told the supervisors that he and the Department of Agriculture were anxious to help them with problems they might incur.

In the area of sewage sludge, Hallowell said that his department has done

some research in this area. If the process is done right, "it can prove to be an asset to farmland."

Rural roads and bridges that pose a severe problem need to be identified he said. Also bridges with weight limits which pose a problem for heavy feed trucks and farm equipment should be identified. He told the supervisors he would help to get more tax dollars to better these roads.



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