

## Jamming Insect Communication Systems

**D**ISCOVERY of a way to disrupt male-female communication links may lead to a new biological control method against two insect pests.

In the past, sex attractants have been identified and produced synthetically for several species. Researchers say these synthetic attractants could be employed in two basic ways—to trap the insects, mainly for survey purposes in integrated control programs, or to disrupt normal sexual behavior of the insects. Both methods of employing synthetic attractants have been studied extensively by entomologists and chemists throughout the world.

Now, a team of ARS and Iowa Agri-

culture and Home Economics Experiment Station scientists at Ankeny, led by ARS entomologist Jerome A. Klun, has scored a breakthrough in understanding the sexual-chemical systems of the European corn borer and red-banded leaf roller moth. Females of both species emit a chemical, 11-tetradecenyl acetate, to attract their mates (AGR. RES., Feb. 1970, p. 7). This compound exists in two geometric forms, or isomers, designated Z (cis)

and E (trans). The Ankeny research team has found that a mixture of the two isomers attracts the insects much more effectively than do pure isomers.

Researchers found that males of the Iowa strain of European corn borers respond best to a mixture of isomers containing 96 parts Z and 4 parts E (96:4 Z/E ratio). On the other hand, male red-banded leaf rollers are most attracted to a 92:8 ratio.

Dr. Klun said the research indicates that although females of both species use the same chemical to attract their mates, the difference in the Z/E ratios naturally minimizes the possibility of a male pursuing a female of the wrong species even though the mating flights of the two species occur concurrently.

In field tests, the researchers disrupted the male-female communication link by distributing synthetically produced E isomer. Males were not attracted to the scent of their potential mates because the proportions of the Z and E isomers in the treated area were altered.

Observing the success of the experiments, Dr. Klun said, "The use of this disruptive technique to reduce mating by insects may be an easier method to implement than has been thought." Further knowledge is needed, however,

to find the best means of dispensing the isomer and minimizing any possible detrimental environmental effects.

In the past, the significance of minor amounts of the E isomer mixed with the Z isomer was not realized, Dr. Klun said, because of the nature of bioassays and chemical methods routinely used in investigations of insect sex attractants. Moreover, in laboratory synthesis of the Z isomer, a pure product is not obtained.

Dr. Klun pointed out that other species of moths may also possess the olfactory apparatus that permits detection of small variations in the geometric composition of sex attractants. In only a few studies of sex attractants of insects in the Lepidoptera order, Dr. Klun said, have the exact geometric compositions of the synthetic attractants been reported.

In view of the recent findings, he suggested that previous research should be re-evaluated and future studies should routinely include an investigation of insect response to varying geometrical proportions of attractants. This could advance knowledge of the chemical communication systems of insects and perhaps bring the day closer when their sex attractants will be useful in suppressing insect pests.

### COURTHOUSE SQUARES



### Dandelion Salad

Wash enough dandelions for four persons. Put salad in a bowl and add two chopped, hard-boiled eggs. In a skillet, fry 1/2-pound of minced bacon. When done, take the skillet from the fire and add to it 1/3-cup of wine vinegar and quickly pour over salad. Season with black pepper and salt. Add fresh watercress for an extra taste sensation.

When picking dandelions for these dishes, the staff at Mercury suggests you look for newly sprouted plants. Older dandelions have a tendency to become slightly bitter.

xxx

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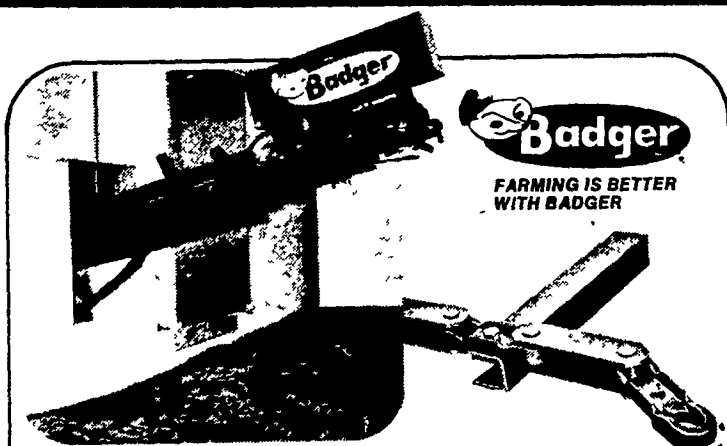
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