

1976 crop yr. (10 ft. plots - 6 rows wide per crop)
Special copy

Control of Insects in Seed Alfalfa with Systemic Insecticides
Applied by Porous Tube Subirrigation

Insect Control

As a result of preliminary studies conducted in 1975 at Brawley it appeared that aldicarb (Temik) might be a potentially effective insecticide for the control of insects affecting seed alfalfa when applied with irrigation water through an underground porous tube subirrigation system. Early in 1976 Union Carbide withdrew aldicarb from consideration in these studies because it was felt the hazards of handling aldicarb in a liquid form were too great for any practical application. Five other materials were selected for study. They were Bidrin, Azodrin, Orthene, Monitor and Union Carbide 21865 (an aldicarb sulfone). Standak

The experimental porous tube subirrigation system became operational in seed alfalfa plots at Davis about mid July. On July 20, 1976 Bidrin, Azodrin, Orthene and UC 21865 were applied to plots through the system. Each insecticide was applied at the rate of 1.0 lb active ingredient per acre. Each treatment was replicated 4 times and each replicate consisted of 8 rows 50 feet long. The insecticides were each injected into the system over a 3 hour period with a peristaltic pump (Scientific Industries Model 203). The irrigation system was operated for an additional hour after the insecticides were introduced to insure complete distribution of the chemicals throughout the system and into the soil. An untreated check consisting of 4 replicates receiving only irrigation water was included in each test. Insect and spider mite populations were determined the day before insecticides were applied and 6 days after treatment. In the July 20 test there were no indications that any of the treatments had reduced the insect populations.

On July 27 a second trial was conducted. In this experiment Bidrin, Azodrin, Monitor and Orthene were applied at the rate of 3.0 lbs active ingredient per acre. All materials were again injected with the same apparatus over a 3 hour period. The insecticides were applied to the same plots as in the first test with the exception of Monitor which was substituted for UC 21865. Insect populations were again measured one day before treatment and 6 days after treatment. The only noticeable change in the insect populations concerned lygus bug nymphs where a 50% reduction occurred. Lygus bug nymph populations increased in all other treatments. in which treatment?

It became obvious at this time that the irrigation system was not functioning properly. Certain plots and portions of plots were obviously not receiving adequate water. The plants in these areas were showing signs of severe drouth stress, and the soil around the roots was dry. It was decided to suspend testing of insecticides until problems with the irrigation system could be resolved.

Although we are not certain at this time, there are several possible reasons for the failure of the technique to provide insect control:

More Entomologist
needed at FSU

Don't know
if they are
injected
into the
apex of the
plant

1. The plants were mature, with a considerable amount of seed set before the system became operational. Although we have no proof it is possible that uptake of the insecticides would be better in vigorously growing succulent shoots.
2. The distribution of water through the system at the time the trials were conducted was poor. It was obvious that several of the plots and individual rows in others received little water from the system. Subsequent examination of the porous tubing revealed that sections of it had little porosity and consequently very little water was escaping from the tubing.
3. The insecticides selected for the tests may not be highly effective when applied in this manner. However, in other uses these materials have been shown to have systemic properties.

In view of the problems experienced with the system, this technique does not appear to have great practical potential in alfalfa seed production, at least as the crop is grown in the San Joaquin Valley.

O. G. Bacon

The Porous Tube System

After failure to supply adequate water in some locations was noted, observation of excavated sections of porous tubing in place in the field showed that some portions exuded no water at all. A few such sections were removed and tested in the laboratory under about 10 times usual operating pressure. In general these sections discharged no water.

The cause of the problem was not exhaustively investigated. Reasonable care was utilized to avoid plugging in operation. The system was initially flushed and the water supply filtered. Many portions of the system functioned essentially according to expectations, but the variability was so great in amount of water discharged (and therefore insecticide) that conclusive tests on insecticides were impossible.

D. W. Henderson