

Antibiotic Control For *Fire Blight*?

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Preliminary Tests Give Hope for Future

Fire blight, caused by a bacterium, *Erwinia amylovora*, is a major disease of pear and apple. It is also of considerable importance in Arizona as a disease of stone fruits and some ornamentals, especially *Pyracantha* and *Cotoneaster*.

Cankers Form

You are probably familiar with the obvious symptoms of fire blight—the blackening of blossoms, fruit spurs, twigs, and leaves, as if seared by fire. All the stages of the disease are not as conspicuous. Cankers or scar tissue in which the bacteria overwinter are found on trunks, branches and twigs of diseased plants. Often there is a crack around the outer edge of the dormant, slightly sunken canker, but these areas are often quite inconspicuous.

In the spring, as the weather gets warmer, the bacteria multiply rapidly in the cankers. At this stage, a liquid containing many bacteria, may ooze from the cankers. Since this stage of the disease coincides with the appearance of the first blossoms, the bacteria are easily carried by insects, rain and wind to blossoms which die, producing no fruit. From the dying blossoms the disease spreads to new spurs and shoots, killing them.

Control Has Been Limited

In the past, control of fire blight consisted of pruning of blighted shoots, surgical removal and treatment of cankers and the use of sprays during blossom time. Copper sprays have met with some success in certain sections of the country, but the value of partial control has usually been offset by damage to fruit and foliage.

The discovery during the last decade

that certain antibiotics were active against some disease-producing agents offered new hope for fire blight control. Streptomycin proved to be effective against the fire blight bacterium in the laboratory, but when used on infected plants allowed development of resistant strains of the bacterium which caused new outbreaks of the disease and against which the antibiotic was ineffective.

So a combination of Streptomycin and Terramycin was formulated and named Agrimycin. This material was given out to scientific investigators in various parts of the country. The Department of Plant Pathology at the University of Arizona was included in this program.

Experiments were undertaken in the spring of 1954 to determine the effectiveness of Agrimycin under our environmental conditions which are quite different from those of other test areas. Apple and pear orchards in the Oak Creek region and in Cochise county in which fire blight had been destructive in previous years were used. Results will be reported after a second season's work.

With the cooperation of four Tucson nurserymen almost 400 *Pyracantha* plants were sprayed with Agrimycin at blossom time. An approximately equal number of plants in each nursery were left untreated. In addition, certain established plantings in Tucson gardens were included in this experiment.

The results of this work were rather surprising. In one nursery where overhead sprinkling was used, favoring the development of fire blight, all the untreated plants developed the disease to some extent, while all the treated plants remained healthy. In the three other nurseries (where overhead sprinkling was not used), the difference was not so marked.

The response of the established plants to treatment was quite spectacular. In one garden espaliered *Pyracantha* had been badly damaged by fire blight the previous year. Eight were sprayed with Agrimycin and four left untreated. All of these plants had cankers on the larger branches. Practically all the blossoms on



This espaliered pyracantha was treated with agrimycin at blossom time. No fire blight developed. The plant showed remarkable growth and fruit set. The untreated plant was so severely damaged by fire blight that it was removed.

the untreated plants were blighted as well as most of the new spring growth, necessitating drastic pruning or removal of the plants. The treated plants remained healthy.

A few unexpected results of the antibiotic treatment of *Pyracantha* should be mentioned. The greater fruit set on the disease-free plants was to be expected. However, in cases where the control plants did not contract the disease, there was a great increase in the number and size of the berries produced by the treated plants. Also, the treated plants grew larger and produced larger leaves and berries, both of better color. These side effects of the treatment may in themselves prove of great importance to nurserymen.

Available Next Spring

These preliminary tests give us great hope that complete control of fire blight in orchards, nurseries and home plantings may be possible. Agrimycin will be available next spring at a price comparable to that of chemical sprays used in the past without giving complete control.