THE GROWER'S ROLE

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IT IS A COMMON MISCONCEPTION that, aside from paying taxes and perhaps providing land or facilities for experimental plots, growers do not contribute directly to agricultural research. Actually they play an important role in the observations and in the development of working hypotheses with which all research begins. Because of their intimate daily contact with the crop, and their intense personal interest in it, growers have often made early perceptive observations, and some have conducted farsighted experiments which defined fruitful areas for investigation.

The well-known fire blight disease of pear and apple was first observed by a New York grower in 1794. Crude inoculation tests by other growers about 50 years later showed that something was transmissible, that it caused the disease on both apple and pear, and that susceptibility to the disease increased with succulence of the tree. Plant pathologists showed (1878–85) that a new class of microscopic pathogens — bacteria — caused the disease. The observation that the principal avenue of infection was through blossoms was called to the attention of pathologists by a grower as early as 1868, and 23 years later research showed that bees spread the bacteria to flowers. Two important concepts—that bacteria may cause plant disease, and that insects may spread plant pathogens —thus developed from grower observations. Growers about 1917 also started spraying apple trees in full flower with Bordeaux mixture to prevent blossom infection. This eventually led to the application of antibiotic sprays during flowering.

In 1905 a grower near Dunsmuir, California, observed that strawberry plants freely produced runners in the mountain fields but not at lower elevations. This was later shown to be due to insufficient winter chilling. Thus the California strawberry nursery industry developed in an area remote from commercial fruit production with an isolation now also recognized as essential in disease control. Growers—noting that nursery plants set out in the fall, fruited in their first year whereas spring plantings missed that year—started early planting.

A serious disease appeared in Hawaiian pineapple fields in 1926 that caused the fruits to develop unilateral necrotic areas which were invaded by secondary organisms and produced severe loss from fruit decay. Plants started from crowns also died, and growers soon found that planting slips or suckers reduced these losses. A grower called attention to the fact that the disease in crowns appeared to start at a tiny yellow spot on one or more leaves. Investigators found that these spots were accompanied by insect oviposition punctures, the cavities of which conformed in size to those made by onion thrips. Transmission tests showed this insect to be the vector of the virus now known as tomato spotted wilt. It was found that early removal from fruits of any crowns showing yellow spots prevented the spread of necrosis to the fruit, and greatly reduced losses.

Growers noted that unsprayed vineyards adjacent to streams in Napa and Sonoma counties in California were not damaged by grape leafhoppers. Research showed that an efficient parasite of this leafhopper overwintered only in the eggs of another leafhopper on the wild evergreen blackberry present in the streambeds. Small patches of these blackberries planted adjacent to vineyards now insure the presence of the parasite.

Bean growers in the Salinas Valley of California noted that root rot caused by a complex of *Fusarium*, *Rhizoctonia*, and *Thielaviopsis* declined when barley straw was turned under prior to seeding. This observation initiated a long series of studies which have effectively reduced the severity of this disease.

These are a few examples, among many, in which growers have blazed trails, later successfully followed by investigators. Experienced research workers pay close attention to grower observations and ideas, even though some of the leads may prove incorrect—as do some of their own. Growers should be encouraged to freely express their ideas and theories to investigators because such teamwork hastens the solution of many agricultural problems.