
EDITORIAL

Bacterial Wilt of Solanaceous Crops

EVER since Erwin F. Smith first described the bacterial wilt disease affecting potato, tomato and eggplant over half a century ago, this disease has been reported from all countries in the tropical belt and others outside it, where relatively high temperatures required for its development obtain. This disease is one of the most important plant diseases of bacterial origin in the world and almost a thousand research papers have been written on the causal organism, the etiology of the disease and its control.

The causal organism of the disease is *Pseudomonas solonacearum*. As its name implies this bacterium is primarily a pathogen on crops like potato, tomato, tobacco, chilli, etc., which belong to the family Solanaceae. Nevertheless it has also been known to affect other crops causing a serious wilt disease of peanut in Indonesia and the famous "Moko" disease of bananas in the Carribbean Islands.

During the early decades of this century bacterial wilt began to affect the world-famous bright-leaf tobacco produced in Granville county in the United States. The sociological and economic impact of Granville Wilt caused abandonment of farms and financial loss estimated at 30 to 40 million dollars. The selection of the resistant tobacco variety "Oxford 26" around 1945 finally enabled the tobacco industry to reduce the adverse economic effects to a practical minimum.

Similarly in the Southern States of U. S. A. bacterial wilt had seriously limited commercial potato and tomato production, the well-known "Southern Wilt" of potato being one of our important plant diseases. In South America, India, Malaya, Sumatra, Indonesia, Philippines, Japan and Australia, the bacterial wilt disease has taken its toll of solanaceous crops in varying degrees.

The bacterial wilt disease was first recorded in Ceylon about forty years ago. Generally it is of greater significance in the wet zone than in the drier parts of the Island. Although it affects potato, tomato, brinjal, chilli and tobacco, the greatest losses it causes is in potato and tomato cultivations. For example, the greatest limitation to the extension of potato cultivation in the Island is bacterial wilt. It has been observed that in areas where a comparatively low

temperature prevails as in the hill country or in those regions where high temperatures obtain during certain periods of the year as in the dry zone, the incidence of the disease is much lower. Cultivation of potato in Ceylon has therefore to be confined to these areas for the present. In spite of considerable research carried out in many parts of the world a variety of potato which is resistant to this disease is yet not available.

The search for varieties of tomato resistant to bacterial wilt has gone on for several decades. Work carried out at North Carolina Agricultural Experiment Station has brought out certain hybrid lines of tomato which have shown considerable promise. Resulting from tests carried out with these varieties and lines independently evolved in Ceylon it has been possible to place in the hands of the cultivator a variety of tomato which has made it possible to reclaim for tomato cultivation areas which could not carry a crop of tomato before. As will be observed from results reported in this number, even under disease-free conditions most of the resistant lines have shown higher yield potential than most commercial varieties. Although some of the resistant lines gave a large percentage of small sized fruits, there are other resistant lines which are capable of yielding 45 per cent. of large-sized fruits. This is indeed a great advance for areas where bacterial wilt has rendered uneconomic the cultivation of the earlier available varieties of tomato.

As far back as 1940, workers in Ceylon selected a variety of brinjal (eggplant) resistant to bacterial wilt. This has subsequently been used as a parent for producing resistant varieties in other countries. Improved local strains of the original variety have maintained resistance up to the present.

The selection and breeding of commercial crops resistant to disease involves considerable work and may sometimes take a long time. From the farmers' point of view, resistant varieties constitute the most desirable means of combatting a disease, eliminating as it does, the expensive and laborious chemical methods of control. In the case of the bacterial wilt disease where research has shown all other methods of control to be ineffective or impracticable, resistant varieties offer the only solution to the problem. Nor is the evolution of a resistant variety the end to our fight against a disease, because the pathogens themselves can often evolve more virulent strains which can break down an erstwhile resistant host variety. The battle therefore is a dynamic one. However, it is heartening to note the advances agricultural research has made so far in its race against a disease like bacterial wilt, which during the last fifty years has taken a heavy financial toll which can be expressed in terms of hundreds of millions of dollars.