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Atelier : Protection des cultures

Cotton wilt in Syria

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Cotton wilt is one of the most important diseases in Syria. It was first observed, in the summer of 1953. Due to continuous cropping of cotton and planting susceptible varieties, the disease had extended by 1965 through most of the cotton growing areas. Infection ranges from 0 to 100% in Coker Carolina Queen which is the only established variety in the country at time, annual loss amounted to about 4% of the total production.

Isolation and infection studies have shown that the disease is caused by *Verticillium albo-atrum* (Reinke and Berthold). Three cultural types of the fungus were obtained by direct isolation from diseased plants on Czapek's agar in petri plates. Those are : 1)- Completely microsclerotical type ; 2)- Completely mycelial type ; and 3)- Appears mycelial from above but shows *microsclerotia* when reviewed from below. Disease severity indexes under greenhouse conditions ranged between 46 to 88 for the microsclerotical type, 1 to 6 for the mycelial type, and 14 to 67 for the mixed type. The 3 wilt infected stations where strains and varieties are tested for wilt tolerance are infested with the microsclerotical and mixed types of isolates.

Breeding for the development of tolerant varieties or strains has started early in the 1960's. The first achievement was the production of a new variety Aleppo 1, developed by single plant selection from the Chinese variety Pengtze.

In 1971, the new Syrian bred variety Aleppo 1 began to replace Coker Carolina Queen. This new variety replaced the old one within three years

because of its higher productivity and tolerance to wilt. It rose the yield by about 35% within 5 years. The average yield of seed cotton in the country had been 1625 kg/ha in 1970, when CC. Queen had been grown, whereas it rose up to 2192 kg/ha in 1975.

The second achievement was the production of a new local variety Aleppo 40, developed by crossing Aleppo 1 with the Californian variety Acala SJ1 in 1970. At F4, some strains proved to be superior to all other varieties especially Aleppo 1 in both yield and fiber characteristics. The only disadvantage was its lateness by 3% than Aleppo 1. This behaviour has been improved by single plant selection. This new variety has replaced Aleppo 1 since 1980 and still remains the main variety growing in Syria up to now.

Field studies have shown that 2-year crop rotation with cereals (wheat or barley followed by corn in the same year) has reduced the severity of wilt from 45% to 33% in the first duration and to 26% in the second duration. On the contrary, 2-year crop rotation with legumes (broad bean, lentils, peanuts and sugar beet) has increased the severity of wilt from 45% to 52%. However, 3 year crop rotation with cereals followed by corn in the first year, and legumes followed by corn in the second year has reduced the severity of wilt from 42% to 20%.

The use of various recommended sources and rates of nitrogen fertilizer with all possible combinations of recommended rates of phosphorus and/or potassium fertilizers showed no effect on

Verticillium wilt severity under field conditions.

It has been found that *hizoctoni solani* and *Meloidogyne incognita acrita* have increased the incidence of *Verticillium* wilt of both tolerant and susceptible cotton cultivars under greenhouse conditions.

The plant breeder should be aware that a variety that is *Verticillium* resistant when grown in soil free of *Rhizoctonia* or *Meloidogyne* may not show this resistance when grown in soil infested with these pathogens. The use of soil or seed treatments to control *R. solani*, or the rootknot nematode, when testing a line of cotton for resistance to *V. albo-atrum*, may lead to erroneous interpretations.

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