



Corky Root of Lettuce¹

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Corky root is a serious disease of lettuce. It has been reported in the states of California, Florida, New York and Wisconsin; and the countries of Canada, Great Britain, Greece, Italy, Netherlands and Spain. Yield losses for fresh and marketable head weights caused by corky root have been reported to range from 37 percent to 53 percent in Florida.

SYMPTOMS AND CAUSAL AGENT

Symptoms of corky root appear initially as yellow lesions, or bands on the tap and/or lateral root (Plate 1). As the disease progresses, the taproot becomes corked and brittle (Plate 2), and may exhibit vascular discoloration. Development of tap and lateral roots in infected plants are severely reduced or completely destroyed. Above ground, infected plants appear chlorotic and stunted. Uneven growth patterns are evident in the field. Heads are not formed at all or maybe unmarketable because of poor size (Plate 3).

The etiology of this soilborne disease was unknown for many years. Its presence was attributed to numerous abiotic and biotic factors. However, in 1984, a slow-growing bacterium was isolated from diseased roots and, in 1988, was finally proven to be the causal agent of the disease. The name



Plate 1.



Plate 2.

Rhizomonas suberifaciens has been proposed for this gram-negative bacterium.

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Plate 3.

EPIDEMIOLOGY

Little information is known about the biology and epidemiology of this pathogen such as the survival mechanisms and the influence of soil environment on disease development. This is due to the lack of a truly selective medium and the slow growth rate of this bacterium in culture. However, *R. suberifaciens* has been isolated from lettuce grown in fields recently brought into production after sugarcane. Similar observations have been made on lettuce grown in soil after pasture or forest. This organism also has been isolated from bean, melon, rye, and tomato, but only members of the Compositae closely related to lettuce (endive, common sowthistle, and prickly lettuce) are susceptible. Evidently, *R. suberifaciens* can survive in association with a number of crop and weed species, especially in root zones of these plants.

Soil type probably has little effect on disease development since corky root has been reported to occur on most soils used for growing vegetables. The pH of soils also seems to have little effect on corky root development, since in the laboratory *R. suberifaciens* has been reported to grow at pHs ranging from 5.7 to 8.2.

Severity of corky root will increase with applications of nitrogen fertilizer, especially with side dressings of N such as urea. High soil moistures and temperatures also appear to favor disease development.

CONTROL

Fumigants such as dazomet, metam sodium and methyl bromide + chloropicrin are very effective for controlling corky root. However, the application of

these materials probably are cost prohibitive on a commercial scale.

Host resistance also is very effective for managing this disease. Resistance is conferred by a single recessive gene. In Florida, several commercially resistant crisphead, romaine and buttercrisp lettuce types are available (Table 1).

Transplanting of corky root susceptible lettuce cultivars either 3 to 5 weeks old also is effective for managing this disease. This practice allows the use of susceptible types that otherwise would be lost.

Table 1.

Table 1. Commercial corky root resistant lettuce cultivars grown in Florida.		
Crisphead	Romaine	Buttercrisp
Florical 50011	Augustus	Florida Buttercrisp
Greenlake	Floriglade	Florida 202
Montello	Tall Guzmaine	
Raleigh		
South Bay		