

**AGROBACTERIUM ROOT ROT AND WILT: A
WIDESPREAD SEEDBORNE DISEASE OF
COTTON AND LEGUMES**
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Abstract

Bronzing, copper top and sudden wilt symptoms that develop on fruiting cotton plants in July and early August are usually caused by infections of a specific group of *Agrobacterium* Biovar 1 isolates, of which many carry Ri plasmids. The bacteria are seedborne and occur in all cultivars, usually in a high percentage of the seed. The bacteria also occur in seeds of soybeans, peanuts, and pinto beans and infect roots of these plants. The bacteria attack young seedlings at the natural wound sites caused by emergence of secondary roots. From 2 to 5 weeks after planting, many of the original secondary and tertiary roots are rotted and replaced by new "white" roots that originate from the same sites as the original roots. During this period the bacteria systemically enter the cotyledons and lower leaves causing bronzing, chlorosis, and epinasty symptoms. During plant development the bacterial concentrations in "white" roots increase two log orders (100-fold) from the 2-3-leaf stage to the 2-3-week-old boll stage. A compatible relationship is maintained during this time, and plants grow vigorously. As bolls approach maturity varietal specific symptoms develop, that include bronzing and defoliation of leaves, collapse and blackening of petiole and stem tissue, distortion of boll development, and extensive rotting of secondary and tertiary roots. Necrotic lesions or proliferated callus cells on main roots contain peak bacterial concentrations of about 100 million/gm fresh root when the late season symptoms appear. Late season symptoms are aggravated by early boll set and heavy fruit loads regardless of cultivar. Bacterial strains from different locations vary in their biochemical properties and toxin-producing abilities. The role of toxins in plant damage are being studied. Both host plant resistance to toxins and biological control with desirable *Agrobacterium* isolates appear to be feasible approaches to controlling the disease.