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Weeds and Epidemiology of Bacterial Leaf Spot of Lettuce in the Everglades Agricultural Area[1]

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Causal organism and history

Bacterial leaf spot of lettuce, caused by *Xanthomonas campestris* pv. *vitians*, was first reported in the United States in 1918 on head lettuce in New York. In Florida, bacterial leaf spot was first reported in the 1992-93 lettuce growing season. All major types of lettuce (crisphead, butterhead, and leaf) were affected, but the disease was more severe in romaine lettuce. So far the disease has not been observed on endive lettuce.

Symptoms

Symptoms of bacterial leaf spot are black, angular, water-soaked lesions that occur primarily on mature, fully expanded leaves (Figure 1). These lesions coalesce as the disease develops, resulting in large necrotic areas and collapse of the leaf. Occasionally, the pathogen may also infect stem tissue, causing stem rot, stunting, and collapse of young plants.

Figure 1. Bacterial leaf spot of lettuce (Photo by Nikol Havranek)

Weeds and disease epidemiology

Infected weeds and epiphytic populations on weeds growing in close proximity to lettuce can be possible sources of initial *Xanthomonas campestris* pv. *vitians* inoculum. *Xanthomonas campestris* pv. *vitians* causes bacterial leaf spot symptoms in broadleaf weeds, including prickly lettuce, trumpet firewood, annual sowthistle, field bindweed, panicled willoweed, shepherd's purse, pineapple weed, netleaf goosefoot, common knotweed, little mallow, and

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common groundsel. However, it does not cause any bacterial leaf spot symptoms on grass weeds. The most common broadleaf weed species in and around lettuce fields in the Everglades Agricultural Area (EAA) include common lambsquarters, *Amaranthus* spp., common purslane, common ragweed, ragweed parthenium, and horse purslane. *Xanthomonas campestris* pv. *vitians* or its epiphytes do not cause any symptoms on these weed species (Figure 2, 3, and 4). Similarly, no growth of *Xanthomonas campestris* pv. *vitians* occurs on glucose nutrient agar following streaking with inoculum from weeds inoculated with *Xanthomonas campestris* pv. *vitians* strains (Figure 5). Thus, these weed species may not be sources of *Xanthomonas campestris* pv. *vitians* inoculum around lettuce fields in the EAA. Nonetheless, control programs for these weed species in and around lettuce fields should be practiced to forestall other negative effects on production.

Figure 2. Spiny amaranth 4 weeks after inoculation with *Xanthomonas campestris* pv. *vitians* strain (Photo by Nikol Havranek)

Figure 3. Common lambsquarters 4 weeks after inoculation with *Xanthomonas campestris* pv. *vitians* strain (Photo by Nikol Havranek)

Figure 4. Common purslane 4 weeks after inoculation with *Xanthomonas campestris* pv. *vitians* strain (Photo by Nikol Havranek)

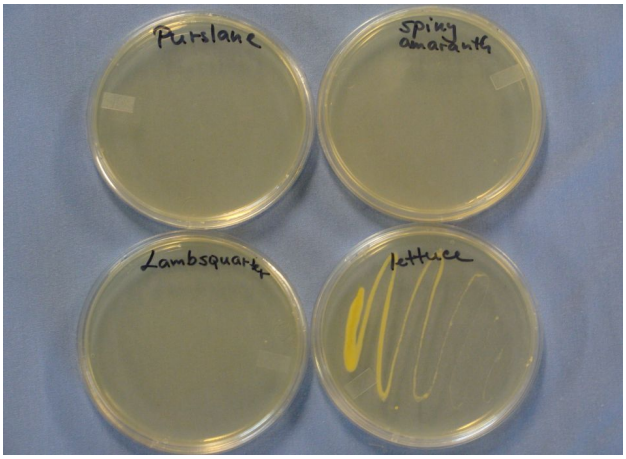

Figure 5. Growth of *Xanthomonas campestris* pv. *vitians* following streaking with inoculum from common purslane, spiny amaranth, common lambsquarters, and lettuce previously inoculated with *Xanthomonas campestris* pv. *vitians* strain (lettuce showing and confirming *Xanthomonas campestris* pv. *vitians* growth while the weeds show no growth) (Photo by Nikol Havranek)

References

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