

Xoo enters the rice leaf typically through hydathodes at the leaf tip and leaf margin. Leaves with BLS may also turn white or grey from the growth of opportunistic or saprophytic fungi, and thus resemble BB. Depending on the growth conditions or the degree of resistance of the cultivars, BB and BLS may be confused with each other or with unrelated physiological disorders of the plant. Cells on the leaf surface may become suspended in guttation fluid as it exudes at night and enter the plant by swimming, or passively as the fluid is withdrawn into the leaf in the morning. Bacteria multiply in the intercellular spaces of the underlying epitheme, then enter and spread into the plant through the xylem. Xoo may also gain access to the xylem through wounds or openings caused by emerging roots at the base of the leaf sheath. Within a few days bacterial cells and EPS fill the xylem vessels and ooze out from hydathodes, forming beads or strands of exudate on the leaf surface, a characteristic sign of the disease and a source of secondary inoculum. Yellow exudate on the leaf surface is a typical sign of BLS, and as is the case for Xoo, it may fall into irrigation water or be dispersed by wind, rain, insects or other means, and contribute to spread of the disease. BB and BLS symptoms are easily differentiated in the early stages of disease and reflect the different modes of infection by each pathogen. The spots expand along the veins, merge, and become chlorotic and then necrotic, forming opaque, white to grey coloured lesions that typically extend from the leaf tip down along the leaf veins and margins. Streaks are translucent and typically yellow.