

INCREASE AND SPREAD OF BROWN SPOT NEEDLE BLIGHT WITHIN SINGLE
AND MULTIPLE FAMILY PLANTINGS OF OPEN-POLLINATED LONGLEAF PINE

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Longleaf pine (*Pinus palustris* Mill.) plantings were established in south Mississippi and southwest Georgia to study the increase in time and space of brown spot needle blight, caused by *Scirrhia acicola* (Dearn.) Siggers. Open-pollinated families with varying degrees of resistance to brown spot were planted in single- and multiple-family plots. Epidemics were initiated by placing severely infected longleaf pine needles on susceptible longleaf source plants in the center of the plots. Disease was measured at 6-week intervals for two growing seasons. Disease progress curves were constructed from these measurements. Disease achieved higher levels in Georgia than in Mississippi. Lesion numbers fluctuated considerably during the course of the epidemics. Curve elements of percent needle dieback progress curves were useful to compare families. Resistant families delayed the onset of needle dieback by as much as 5-7 weeks, had fewer numbers of lesions, and had lower levels of maximum dieback. The rate of needle dieback/week (YRATE) varied by distance from the initial infection focus but there were no significant family or location differences (YRATE = .026-.033). The rate of pathogen movement outward from initial infection foci was similar for all families and for both locations. Isopaths of lesion numbers moved outwardly (or centrifugally) from center of plots at rates of 0.05 m/wk, while isopaths of needle dieback averaged 0.13 m/wk. The mixing of resistant and susceptible families did not mitigate the BSNB epidemic as factors favoring auto-infection predominated over those favoring allo-infection. Ninety-nine percent of all trees were out of the grass stage by the end of the second growing season. Family means of second-year height ranged 28-47 cm in Mississippi and 30-37 cm in Georgia. Correlation between percent maximum needle dieback and second year height at each location was not statistically significant (Mississippi: $r = -0.46$ and Georgia: $r = -0.45$).

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