FACTORS AFFECTING THE INCIDENCE AND DEVELOPMENT OF BLACK SEED ROT OF SLASH PINE CAUSED BY LASIODIPLODIA THEOBROMAE

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Abstract.--A study was initiated in the fall of 1988 to determine the incidence of diseased seed occurring in seed orchard trees before cone harvest, and the impact of cone harvesting practices on the incidence of seedborne fungi and the development of disease in seed. Four ramets of four slash pine clones (16 trees total) were selected. in a north Florida seed orchard. Cones were harvested from each tree on three dates (8/31, 9/14, 9/26) and were divided among three treatments:

1) No Ground Contact/No Storage (NGC/NS) - cones handpicked, placed individually in #5 kraft paper bags, and immediately dried at 38 C for 48 hrs;
2) No Ground Contact/Storage (NGC/S) cones handpicked, placed individually in #5 kraft paper bags, stored for 5 wks in a ventilated building without temperature control, then dried at 38 C for 48 hrs;
3) Ground Contact/Storage (GC/S) - cones handpicked, dronped to the ground, picked up 72 hrs later and placed individually in #5 kraft paper bags, stored for 5 wks, then dried at 33 C for 48 hrs.

Seed extracted from each cone were radiographed and assessed for the percentage of seed that were filled, empty, fungus-damaged, and damaged due to other causes. A sample of seed from each cone was subsequently plated on two types of agar media to determine fungal associations with seed. A sample of cones was obtained from each tree at each sample period for determination of specific gravity.

Disease was absent, and seedborne fungi were essentially nonexistent in seed obtained from cones in the NGC/NS treatment. The incidence of cones with diseased seed in the NFC/S treatment was low for all. harvest dates (range, 20 to 10 percent). In contrast, the percentage of cones with diseased seed was high (55%) in the GC/S treatment for the 8/31 harvest date. Cones of all clones were highly susceptible when harvested. at this time (range, 42-75% of cones with diseased seed). At the 9/14 harvest date, the incidence of cones with diseased seed in the GC/S treatment declined for all clones (range 0-17%) with the exception of one clone (ID-007, 58%). On the 9/26 harvest date, only 4% of all cones contained any diseased seed in the GC/S treatment (range among clones, 0-8%). Seed from individual cones with a high incidence of fungal-type damage yielded almost exclusively Lasiodiplodia theobromae. The results of this study provide evidence that cone maturation (i.e. specific gravity) at harvest may be critical for cone colonization and seed infection by fungi which cause disease in slash pine seed.