

ASSESSMENT OF *ANGUINA* AND *CLAVIBACTER* IN ORCHARDGRASS

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Anguina species are flower-infecting nematodes of cereals and grasses. In Oregon, *Anguina* can occur in bentgrass and orchardgrass. In bentgrass, the nematode causes long, needle-like, black galls in the inflorescence; each gall replaces a seed. The nematodes overwinter in the galls and in the spring emerge to infect plants.

Little is known about *Anguina* in orchardgrass. It is believed to be a different species than attacks bentgrass. Unlike the galls in bentgrass, which are many times the length of the seed, and black in color, the galls from orchardgrass are smaller than normal seed, brownish to purplish in color, and nearly impossible to see with the lemma and palea covering the seed. Often associated with the nematode is a soil dwelling bacterium (*Clavibacter*) which attaches to the nematode body and is carried into the plant by the nematode. As infection occurs the bacterium proliferates and eventually overwhelms the nematode, replacing the nematode gall with a lemon yellow colored gall containing bacteria.

In order to quantify the level of *Anguina* and *Clavibacter* in orchardgrass, a procedure was needed to remove the lemma and palea from the orchardgrass seed. A small air powered scarifier was developed in association with Mater Industries. The unit proved successful in removing the lemma and palea with no visible damage to the seed and only minor damage to the galls of *Anguina* or *Clavibacter*.

One Hundred samples of orchardgrass submitted to the OSU Seed Lab were examined for galls of *Anguina* and *Clavibacter*. For each sample, 5 subsamples (each containing 5 grams of seed) were processed in the scarifier at 50 psi for 1.5 minutes. Fines were removed on an air column, and galls screened from the seed with a 6 X 32 mesh sieve. The galls were visually identified under a dissecting microscope. Galls were verified by placing bisected galls in a drop of water for one minute and examination for the nematodes or bacteria. Following visual inspection the sample was coarsely chopped and flooded with water. After one minute the sample was examined again for any galls missed during the first inspection. When exposed to water, the nematodes immediately begin to swell and effuse from fractured galls.

The number of seed in 25 grams was estimated after removal of the lemma and palea. Weights of 200 hand counted seed samples were used to estimate total seed in the 25 gram samples. The percentage of seed replaced by *Anguina* or *Clavibacter* was calculated. *Anguina* was detected in 48% of the samples and *Clavibacter* was detected in 40% of the samples. The number of galls per 25 gram sample ranged from 1 to 22 for *Anguina* and from 1-39 for *Clavibacter*. In no case did per-

cent infected seed exceed 0.25% for either *Anguina* or *Clavibacter*. Although not considered a production problem, presence of *Anguina* can prohibit shipment of seed to some countries.