

Dwarf Bunt of Wheat

Tilletia controversa

EPMS 010

Quick Facts

- Dwarf bunt is caused by the fungus *Tilletia controversa*.
- Dwarf bunt infects winter wheat and rye.
- Spores produced by dwarf bunt can survive in the soil for up to 10 years.
- Wheat cultivars with resistance to dwarf bunt are available.
- Infected plants cannot be cured with fungicides.
- Seed treatment may provide control of dwarf bunt infections.

with extended snow cover. Occasionally, farms in northern Utah and winter wheat farms at higher elevations experience this disease when susceptible wheat varieties are planted.

Symptoms:

Dwarf bunt gets its name because infected plants are stunted in growth when compared to healthy plants. Excessive tillering also accompanies stunting (Figure 1). The kernels are replaced with smut balls, which have dark black spores (Figure 2). When the smut ball is crushed, a foul, fishy odor is present.



Photograph Courtesy: Sherman V. Thomson

Figure 1. Wheat plants infected with *Tilletia controversa* (middle). Healthy wheat plants (left and right)

The smuts and bunts are a group of related fungi that infect developing grain. These pathogens can cause significant yield losses and may cause hazardous conditions for combine operators. Dense concentrations of spores suspended in the air can be explosive. In Utah, four types of smut and bunt are of economic importance. These are loose smut (*Ustilago* spp.), covered smut (*Ustilago* spp.), common bunt or stinking smut (*Tilletia* spp.), and dwarf bunt (*Tilletia controversa*). Dwarf bunt infects winter-sown wheat in areas



Photograph Courtesy: Sherman V. Thomson

Figure 2. Wheat head with "smut balls" in place of seeds.

infection of the seedlings occurs under the snow in January or February and usually when snow cover lasts longer than 100 days. Even in the absence of a susceptible host or resistant wheat varieties, the spores released from infected plants will survive for up to 10 years in the soil.

The fungus has overcome the resistance in some wheat cultivars in a few geographical areas in Northern Utah making the use of resistant cultivars less effective.

Causal agent:

Dwarf bunt belongs to a general group of fungal diseases that infect plants and replace their seeds with spore masses (spore balls). Certain species of *Tilletia* caused smuts and bunts produce trimethylamine in their spores. This chemical compound is commonly produced by decay organisms and is the cause of the characteristic foul fishy odor present on dwarf bunt infected wheat plants. The optimum growth temperature of *Tilletia controversa* ranges from 33-46° F, therefore

Control:

Plant resistant winter wheat varieties or avoid the disease by planting spring grains. Resistant varieties released by the Utah Agricultural Experiment Station include: Promontory, Garland, Utah-100, Golden Spike, Deloris, Lewjain, Luke, Franklin and Weston. Morland is listed as a susceptible variety. Dividend is an effective seed treatment that could be used to protect susceptible cultivars or in areas where the fungus has overcome the resistance in certain cultivars.

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Information to request for samples of Dwarf Bunt.

Grower Information

Name:

Address:

Farm Location:

Crop Information:

Seed Source:

Plant and Variety:

Source of irrigation water

Irrigation type and frequency:

Soil type:

Crop rotation history (current and previous 10 years):

Miscellaneous:

Pesticides applied:

Fertilizers applied:

Seed treatment applied:

Neighboring fields with winter wheat: yes/no

Are neighboring fields experiencing same disease: yes/no