Common Bunt (Stinking Smut)

Pathogens: *Tilletia caries* (*syn. T. tritici*) and *Tilletia laevis* (*syn. T. foetida*)

Host: Wheat (*Triticum aestivum*); related cereals and grasses

Disease type: Seedborne and soilborne fungal disease

Primary inoculum: Teliospores contaminating the surface of seed or in soil

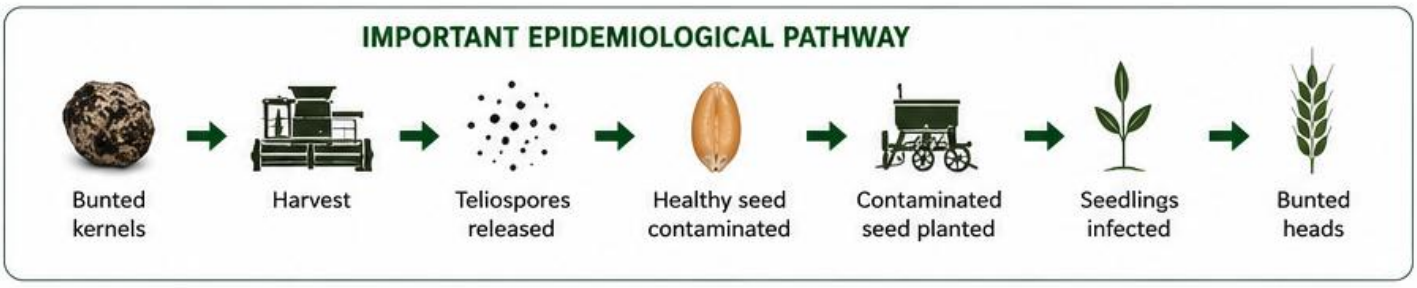
Disease Overview

Common bunt, also called **stinking smut**, is an important fungal disease of wheat caused by *Tilletia caries* and *T. laevis*. Infected kernels are replaced by **bunt balls** containing millions of durable teliospores. At harvest, bunt balls rupture, spreading spores onto healthy kernels, harvesting equipment, storage areas, and soil. Unlike loose smut, common bunt is primarily transmitted by teliospores carried on seed surfaces rather than fungal mycelium within the embryo. Consequently, visibly healthy seed can carry the pathogen and introduce it into new fields or seed lots. Teliospores in infested soil can also initiate infection.



Photo: Ruben Durán, Washington State University

When contaminated seed is planted, teliospores germinate and infect young wheat seedlings during germination and emergence. The fungus grows systemically within the plant, often remaining undetected until heading and grain development, when infected ovaries develop into bunt balls. Even low levels of seed contamination can perpetuate the disease across growing seasons. Common bunt reduces yield and seed quality, produces a characteristic **fishy odor**, and can result in grain dockage or rejection. **Using pathogen-free seed, seed testing, sanitation, and effective seed treatments are essential for preventing introduction and interrupting the disease cycle.**



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Common Bunt (Stinking Smut)

Conditions that favor disease development

Common bunt infection is strongly influenced by conditions during germination and seedling emergence, rather than by conditions during flowering or grain fill.

- **Cool soil temperatures** ~5–15°C (41–59°F) favors both teliospore germination and subsequent infection of seedlings.
- **Winter wheat** plantings are more susceptible to bunt than spring plantings because soil temperatures are often near optimal range for the fungus.
- **Moist soil** promotes teliospore germination, seedling infection, fungal growth, and spore production.
- **Risk increases** with deep planting, slow germination, delayed emergence, poor seed vigor.
- **Contaminated seed** provides teliospores at the ideal location for infection of emerging wheat seedlings.
- **Infested soils** harbor teliospores that may initiate infection when susceptible wheat is planted.

Disease Symptoms And Signs of Pathogen

Crop Stage	What to Look For	Diagnostic Significance
Seedling / Vegetative	Mild stunting Delayed development Fewer or weaker roots Altered tillering	Infection may be difficult to detect Few visible aboveground symptoms
Heading	Blue-green heads Slightly swollen spikelets Broader heads Glumes may spread or distort	Symptoms become more apparent after heading
Maturation	Infected heads remain green longer Delayed maturation Diseased heads remain more erect Symptoms more pronounced	Compare affected and healthy heads.
Kernel Development/Harvest	Kernels replaced by gray bunt balls Crushed bunt balls release masses of dark brown to black teliospores Fishy odor	Bunt balls are the most diagnostic sign Spores contaminate grain and equipment

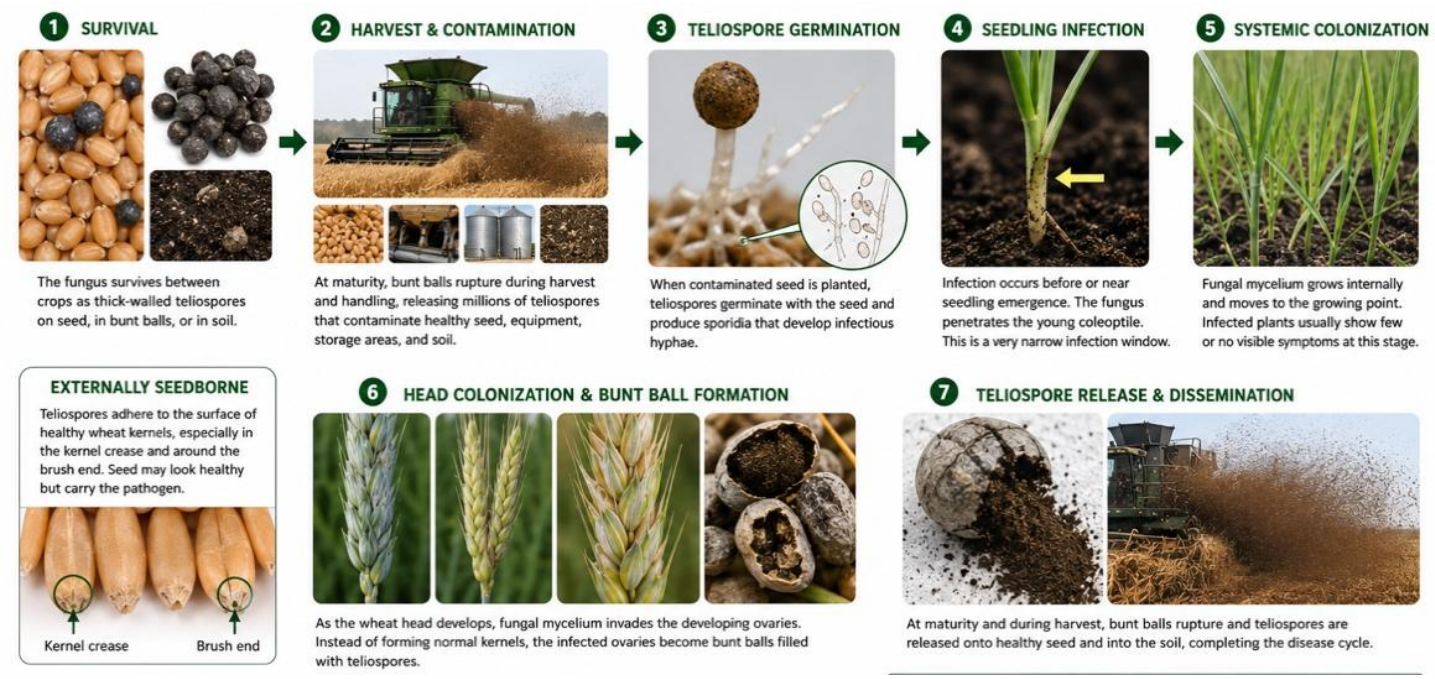
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Seedborne Cycle of Common Bunt



Management Options for Common Bunt

1. Good sanitation practices: To reduce pathogen transmission and contamination clean all planting, harvesting, and cleaning equipment before and after use or when moving to a new field (Hanna et al., 2021).

2. Use certified pathogen-free seed: Common bunt can become a problem when seed infected with *Tilletia* spp. is saved for multiple years. Introducing new, certified, pathogen-free seed can help minimize risk. Seed samples can also be sent to diagnostic labs to determine bunt infection of seed that is being saved for planting.

3. Thorough seed cleaning: Thoroughly cleaning an infected seed lot with air stream or gravity cleaning equipment can remove most of the intact bunt balls and some of the free spores. If this is followed by a brush-cleaner, free spores in the seed lot can be reduced upwards of 99% (Borgen, 2005)

4. Crop rotation: Rotate to non-grass crops for at least two years (longer if possible) if common bunt is present (Chen et al., 2026).

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5. **Planting time:** Planting winter wheat early or spring wheat later when soil is above 60F gives the germinating seedling time to outgrow the fungus reducing likelihood of infection.

6. **Fungicide treatments:** There are both conventional and organic treatments that can be applied before planting. Conventional treatments have shown significant reduction in common bunt infection. Although there are organic fungicide treatments, these are less effective (Matanguihan et al., 2011). Fungicides applied commercially to certified seed prior to grower's purchase assures optimal coverage and a uniform dosage of fungicide. Confirm with your local state agency or extension office for guidance on fungicide use.

7. **Alternative treatments:** Currently the use of ozone is being studied and has shown efficacy in reducing the disease burden while maintaining seed health (Sanchez et al., 2025). Additional research is needed to develop recommendations to ensure the proper treatment of seed to achieve disease management outcomes while not harming seed quality.

References

1. Borgen, A. (2005). ICARDA Seed Info., 29, 13-15.
2. Chen, D., et al. (2026). Plant Pathol. J., 42(4), 412-426. DOI: 10.5423/PPJ [incomplete].
3. Hanna, M., et al. (2021). Recommended Procedures for a Complete, Top-to-Bottom and Front-to-Back Combine Cleanout. Iowa State University.
4. Matanguihan, J. B., et al. (2011). Plant Dis., 95(2), 92-103. DOI: 10.1094/PDIS-09-10-0620.
5. Pscheidt, J. W., & Ocamb, C. M. (Senior Eds.). (2026). Pacific Northwest Plant Disease Management Handbook. Oregon State University.
6. Rodarte, D., et al. (2025). Ozone Sci. Eng., 47(4), 353-365. DOI: 10.1080/01919512.2025.2461461.
7. Wegulo, S. (2009). Common Bunt (Stinking Smut) of Wheat. University of Nebraska-Lincoln.

Sponsors

The authors gratefully acknowledge funding for this project from the Organic Research and Education Initiative (Grant 2023-51300-40916) as part of USDA National Institute of Food and Agriculture.

Cite as

Sassi, G., Damann, K., and Darby, H. (2026). Common Bunt (Stinking Smut) of Wheat. University of Vermont Extension, Burlington, VT.

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