

European Organic Wheat Suffers from “Stinking Smut” Disease due to Lack of Fungicide Seed Treatment

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Leonard Gianessi and Ashley Williams

Common bunt is one of the most destructive diseases of wheat worldwide [1]. Spores in wheat seeds or in the soil germinate and grow in the wheat plant before emergence from the ground. As the fungus grows in the plant, the wheat kernels are converted into bunt balls that when crushed release thousands of black spores [2]. They also smell of rotting fish, hence the name “stinking smut” is also used to describe common bunt. Yield losses almost equal disease incidence because wheat kernels are replaced with bunt spores [1]. Bunt has been a despoiler of wheat since time immemorial [3]. Bunt has always been present in European wheat fields and was the principal cause of 25 to 50 percent yield loss in the 1700s [3].

Over the years, experimentation revealed that bunt incidence could be reduced by treating wheat seeds with substances such as cattle urine, lye, lime, salt, formaldehyde, copper and mercury. In the 1950s through the 1970s the development of synthetic chemicals resulted in systemic fungicides that penetrated wheat seeds and prevented the smut fungi from growing. In a matter of years, the new chemicals were widely adopted. Throughout the world, common bunt was finally controlled. This classic, textbook disease was rarely seen in farmers' fields. Common bunt had become a forgotten disease—until its reemergence in European organic wheat [1].

The legal requirement for organic seed has compounded the bunt problem in Europe. For many years, it was possible to use conventionally produced seed which had been grown from plants for which chemical seed treatments had been used. All of this changed with a 2004EC Regulation which stipulated that all plant materials used for organic agriculture must be produced with organic farming methods [1]. Thus, seed for organic wheat cannot be produced on plants where seed treatments have been used. In the United Kingdom, organic seed lots are predominately contaminated with common bunt spores [1]. If untreated seeds are used, the incidence of common bunt can reach 70 to 80 percent. The disease has the potential to cause economic devastation to European organic growers [1]. In the U. S., common bunt is not yet a major problem in organic wheat, likely because conventionally produced seed can still be used on organic farms [1].

References

1. Barroga-Matanguihan, J., K.M. Murphy and S.S. Jones. 2011. Control of Common Bunt in Organic Wheat. *Plant Disease*. 95(2)92-103.
2. Mathre, D.E., R.H. Johnston, W.E. Grey. 2001. Small grain cereal seed treatment. *The Plant Health Instructor*. APSnet Education Center. Available at: <http://www.apsnet.org/edcenter/Pages/phi.aspx>.
3. Large, E.C. 2003. *The Advance of the Fungi*. The American Phytopathological Society. St. Paul, Minnesota.



Wheat bunt:
top—no seed treatment,
bottom — seed treatment



Grain infested with black spores
of the common bunt pathogen



Combine releasing spores