

Overview of NAPPO RSPM 21
A Harmonized Procedure for Morphologically Distinguishing Teliospores
of Karnal Bunt, Ryegrass Bunt, Rice Bunt and Similar Smuts

Purpose: Bunts and smuts are fungal pathogens that infest grains such as wheat, rye, and rice. Their effective management and control require positive identification. The teliospores (thick-walled dormant spores) of Karnal Bunt (*Tilletia indica*), rice smut (*Tilletia horrida*), and ryegrass bunt (*Tilletia walkeri*) are similar in form and structure (morphology), and it may be difficult for fungal scientists (mycologists) to distinguish between teliospores of these three pathogens in some situations. This standard provides NAPPO member countries with a harmonized procedure for distinguishing between the teliospores of these three pathogens based on an evaluation and comparison of their morphology.

Contents: RSPM 21 addresses the roles and requirements of identifiers (mycologists), the complexities of the identification process, preparation of samples, diagnostic principles, and sources of scientific support.



Tilletia indica, surface view.
Photo by Lisa Castlebury

Summary of RSPM 21: Identifiers of smuts and bunts should be experienced mycologists with considerable expertise in recognizing *Tilletia* teliospores. Identifiers must also consider information on the presumed host (e.g., wheat, rye, rice) and the geographic origin of the sample when forming an opinion on the identity of the fungal pathogen. Relevant diagnostic details for bunts and smuts contained in RSPM 21, including those for other similar species, are summarized in a Table on page 8 of RSPM 21. Diagnostic details include the diameter of the teliospore, its color, its shape, and its ornamentation (e.g., the presence, absence, size, and arrangement of ridges, spines, and/or warts). Also included is a list of six scientists from NAPPO member countries who can assist in providing diagnostic advice.

Appendix 1 contains photographs of teliospores of the three pathogens referred to in RSPM 21 as well as those of other similar species.

Please read RSPM 21 for a more complete understanding of the process for distinguishing between teliospores of Karnal Bunt (*Tilletia indica*), rice smut (*Tilletia horrida*), and ryegrass bunt (*Tilletia walkeri*).

Photo by Lisa Castlebury https://nappo.org/application/files/5115/8352/2972/RSPM_21-06-11-14-e.pdf