

## Common bunt management on organic wheat: multi-factorial, knowledge-based

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Techniques that allow the management of common bunt in organic farming - including sound crop management, observation, seed analyses and seed treatments – are well identified. When these are not put into practice, occurrences of common bunt still regularly devastate organic wheat crops. The research and development presented here follows two objectives: Firstly, collecting techniques available for bunt management and developing appropriate dissemination formats. Secondly, exploring new approaches, ranging from novel seed treatments to more holistic approaches to plant health.

An inquiry was performed over 4 years in the LIVESEED project, putting emphasis on the exchange of knowledge between European countries and across disciplinary boundaries. Meetings and workshops among researchers and practitioners allowed both for the exchange of knowledge on existing techniques for bunt management and for the emergence of unanswered questions. Field and laboratory trials were conducted to test and fine-tune seed treatments. Empirical experience with common bunt was explored through qualitative interviews. Particular attention was placed on farmers' varieties, which pose specific constraints.

As first outcome, several formats were developed for disseminating the knowledge on the combination of multiple practices that reduce the risk of common bunt, including workshops, websites, videos and Practice Abstracts. Specific knowledge gaps or frequent practical shortcomings were highlighted. We infer that reliable bunt management in organic farming requires specific knowledge on the disease cycle of the fungus, as well as practical and observation skills on behalf of practitioners.

As a second outcome, information on official thresholds for bunt spores in certified wheat seed in EU member states was retrieved, allowing for a comparison of national regulations, serving as basis for discussions on transparent rules for bunt management in organic wheat seed.

Thirdly, seed treatment examinations produced operational knowledge to optimize their application (storage of CERALL, use of vinegar).

Unanswered questions for future research include: To what extent is bunt present in organic cropping systems without causing symptoms? What role do soil microbiota play in suppressing bunt? What types of plant defense mechanisms come into play? Is genetic diversity reduced when breeding for resistant wheat cultivars? Are there allelopathic effects of previous or mixed crops in diversified crop rotation? Which farm-produced seed treatments may be efficient?