

THE ROLE OF CULTIVAR AND PRECEDING CROP IN NATURE-BASED PEST REGULATION IN WINTER WHEAT AGROECOSYSTEMS

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The increasing emphasis on environmentally sustainable crop production has stimulated interest in ecological approaches capable of reducing pesticide dependence while maintaining the phytosanitary stability of agroecosystems. Among such approaches, the deployment of resistant cultivars and the optimization of crop rotation systems are considered important tools for enhancing natural pest regulation.

Field experiments were conducted in the The V. M. Remeslo Myronivka Institute of Wheat in the Central Forest-Steppe of Ukraine using fifteen winter wheat cultivars grown after two preceding crops: white mustard incorporated as a green manure crop and soybean.

Objective. To assess the effects of preceding crops and cultivar-specific traits on the abundance of major phytophagous insects in winter wheat and to evaluate the potential of host-plant resistance as a component of nature-based pest management in conservation and regenerative farming systems.

The phytophagous insect community associated with winter wheat was represented primarily by flea beetles, leafhoppers, cereal flies, cereal leaf beetles, aphids, wheat thrips, and the sunn pest. Although the species composition of the pest complex remained largely unchanged across preceding-crop treatments, substantial differences in population density were recorded. Following white mustard, the abundance of flea beetles ranged from 8 to 20 individuals per 100 sweeps, leafhoppers from 5 to 30 individuals per 100 sweeps, cereal flies from 45 to 125 individuals per 100 sweeps, and wheat thrips from 180 to 445 individuals per 100 sweeps.

In contrast, winter wheat grown after soybean generally supported higher populations of several pest species. Under these conditions, flea beetle abundance reached 33 individuals per 100 sweeps, cereal fly abundance 115 individuals per 100 sweeps, and wheat thrips abundance 420 individuals per 100 sweeps. The cultivars Vezha

Myronivska, MIP Darunok, MIP Fortuna, and MIP Lakomka exhibited the lowest levels of pest colonization and maintained comparatively favourable phytosanitary conditions.

The lower abundance of dominant phytophages recorded after white mustard indicates that the inclusion of green manure crops in crop rotations may contribute to the suppression of pest populations and improve the ecological functioning of cereal agroecosystems. These findings highlight the importance of crop rotation design as a factor influencing biological regulation processes in winter wheat production systems. Across both preceding-crop treatments, the cultivars Vezha Myronivska, MIP Darunok, MIP Fortuna, MIP Dovira, and MIP Feieriia maintained relatively low infestation levels, suggesting a higher degree of field resistance to the principal phytophagous species. The consistent performance of these cultivars under contrasting crop rotation conditions demonstrates their potential value for the development of low-input crop protection strategies.

The results obtained support the integration of host-plant resistance and ecologically optimized crop rotations as complementary components of nature-based pest management. Such an approach may strengthen agroecosystem resilience, reduce reliance on insecticide applications, and facilitate the implementation of conservation, ecological, and regenerative agriculture practices.

Keywords: winter wheat; phytophagous insects; varietal resistance; green manure fallow; nature-based pest regulation.