Wheat undersowing for pest regulation in white cabbage

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Intercropping is a broadly studied measure for biological control in vegetable crops. Although many studies already confirmed pest regulating effects of different cabbage intercropping systems, especially undersowing with clover species, the system is still not widely transferred into agricultural practice. Therefore, we evaluated the overall suitability of winter wheat as undersowing plant for white cabbage, as it is easy to assess and establish for farmers and unlike clover does not develop offshoots. Pest regulating effects with focus on flea beetles and aphids, as well as effects on yield and natural enemy abundance were assessed.

Between the years 2017 and 2021, six field trials were conducted in small plots (20-32 m2), each in randomized complete block design in four to eight repetitions. In each trial, undersown cabbage plots were compared to control plots without undersowing. In undersowing plots, single-rows of wheat were sown directly between cabbage rows. Wheat was sown six weeks before transplanting of cabbage in middle of May, to ensure effects on pest insects in early cabbage developmental stages. Numbers of flea beetles and their feeding damage as well as numbers of aphids and their natural enemies were counted weekly on six to ten cabbage plants per plot. In four of the six trials, epigeic predators such as spiders, rove beetles, coccinellids and ground beetles were additionally assessed in pitfall traps. In October, harvested cabbage plants were weighed and remaining quality losses due to feeding of pest insects were assessed on harvested heads and roots.

Results show reduced numbers of Phyllotreta spp. flea beetles and both aphid species, Brevicoryne brassicae and Myzus persicae in undersown cabbage in most of the years. However, enhancing effects on natural enemies are not consistent in all trials. Also, there was a slight but significant negative effect on yield in some years.