Weed flora evolution in direct seeding under cover

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Abstract

Direct seeding under cover, by its emergent properties, raises new questions of research on weed communities. The absence of soil disturbance and the implementation of cover crops, modify all factors of conventional agriculture and lead to a complete change of habitat for and management of the weed flora. In addition, these systems allow the development of a certain number of animal communities that interact with one another and with plant communities and thus potentially promote the regulations expected in Agroecology. Finally, there is the issue of annual weed species diversity in systems where tillage is strongly reduced.
This thesis, started in November 2017, has as main objective to provide an understanding of direct seeding under cover cropping systems effects over time on weed communities. In different pedoclimatic conditions of the region Bourgogne Franche-Comte, 73 winter-wheat fields, belonging to different age classes (1 to 3 years, 4 to 6 years, $>$ 6 years since the adoption of direct seeding under cover), have been studied. In each field, weed communities were surveyed 2 or 3 times in 2018: resumption of growth (March), before harvest (mid-June) and during the cover cropping period.
First results (March 2018) show that species richness, ranging from 1 to 25 species per field is higher than in conventional agricultural fields. Difference in weed flora diversity occurs between the different categories and species richness appears higher in the oldest, more stable systems (3 to 4 more species per field in average in the $>$ 6 years category). In the same time, differences in composition are also expected between the different age classes but no trend of perennial weed selection (hemicryptophytes, geophytes) in weed communities with increasing time to conversion to direct seeding under cover appears.

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