Potential of cover crops for weed management in organic cropping

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**Implications**

The occurrence of weeds can be reduced with successful choice of cover crops which are grown together with the main crop. Cover crops compete against weeds and, moreover, leguminous cover crops leave nitrogen for the subsequent crops in the rotation and thereby improve their competitiveness against weeds. Weed management with cover crops should be built into a sustainable integrated weed management strategy which enhances both the weed control and the biodiversity in crop stands.

**Background and objectives**

In Northern Europe, the current crop rotations in arable fields are often too short and dominated by spring-sown annual crops. In consequence, some weed species become highly abundant and hamper crop production. With systematic choice of cover crop species and their mixtures we could control weed growth without significantly impeding the crop growth. However, the crop–cover crop–weeds interplay is sensitive to cropping measures and weather conditions. Need for studying the most feasible cover crop practices is evident.

**Key results and discussion**

Red clover (*Trifolium pratense*), white clover (*Trifolium repens*) and timothy (*Phleum pratense*) have a good potential of preventing weed growth. In the sowing year, the cover crops are too slow to effectively hamper the emergence and early growth of annual weed species but later in the growing season they interfere with weeds. The competition continues after harvest and therefore the tillage should be delayed until late autumn or even to the next spring. The long-term effect was demonstrated in Latvian experiments one year after the cover crops; the weed density in cover crop plots was significantly lower than in the plots without cover crops (Zarina et al. 2015). Based on the promising results on cover crops in Finland, farmers are encouraged to sow catch crops also in winter cereals early in the spring. Short-growing clover species do not cause significant yield reductions to the main crop. Tall-growing clover species (*T. resupinatum* and *T. incarnatum*) and *Melilotus alba* were too competitive to the crop. Italian ryegrass (*Lolium multiflorum*) can also be too aggressive when sown at the same time with the spring cereal. Delayed sowing is recommended particularly in light soils.

**How work was carried out?**

Field experiments with cover crops in cereals were carried out both in Finland and Latvia. Selected plant species (legumes and grasses) were undersown as cover crops either alone or as mixtures. In Finnish experiments altogether 16 species in mixtures were evaluated. Benefits of cover crops were assessed by measuring weed growth and crop yield. In Latvia, the subsequent effect was measured one year later in grassland.

**References**

Zarina, L.,Gerowitt, B., Melander, B., Salonen, J., Krawczuk, R., Verwijst, T. (2015**.)** Crop diversification for weed management in organic arable cropping systems. Proceedings of the 10th International Scientific and Practical Conference. Environment. Technology. Resources, Rezekne, Latvia, Volume II, 333-336. <http://journals.ru.lv/index.php/ETR/article/view/274>