# IS COMPANION PLANTING AN OPTION FOR OILSEED RAPE?

Growing companion plants along with the main crop is an option that is being seriously considered by growers today. Companion plants play an important role that goes beyond increasing biodiversity in narrow crop rotations.

Fig. 1: On 30/10/2020, the companion crop presented a lush vegetation.

There are many good reasons for companion planting: their roots help stabilise and promote the soil structure and they create an intelligent mix of plant communities. In addition, the increased number of root passages in the soil improves the supply of oxygen and increases gas exchange, all of which promotes the supply of nutrients and ensures the best conditions for a thriving microbiome. As the leaf surface area increases in the early stages of growth, both photosynthesis and biodiversity also increase, which in turn provides an additional habitat for insects and other beneficial organisms.

## Experience with leguminous companion crops

A field trial was set up in the 2020 growing season by Deutsche Saatveredelung AG (DSV) in the Münsterland and Soester Börde regions in Germany to test leguminous companion crops for oilseed rape.

The fundamental conflict between growing oilseed rape and a legume species in parallel is the sowing date, because the legume prefers early sowing, i.e. early August, whereas oilseed rape seed dates are now moving to mid-September. Oilseed rape shows a much faster early growth rate when the plants are young and is thus a very competitive crop. For the companion crops to take advantage of optimal conditions in August, sowing took place on two different dates.

The straw of the previous barley crop was recovered and the soil received a deepsoiling pass about 35cm deep. The straw and soil were not mixed together. The aim of this was to prevent volunteer cereals from being worked deep into the soil, where they would fall into dormancy and germinate at a later tillage pass. After the deep loosening pass, the companion seed TerraLife BrassicaPro was sown on 22/07/2020 at a seed rate of 15 kg/ha and approx. 1 - 2 cm deep. 80 percent of the mix were legumes – Serradella, Blue Lupine, Alexandrine Clover, Persian Clover and Guizotia abyssinica and Oil Flax small-grained seeds. The companion crop had established very well by the time the rape seed was sown, which was certainly also due to the heavy rainfall in August with local rainfall of more than 100 millimetres in the Münsterland area (see Fig. 2).

By comparison, the companion seed trial that was carried out in the Soester Börde had to be abandoned due to the serious drought in late summer. Here the testers observed that the volunteer cereals competed too much with the companion crop for the available water, which impaired the development of the new TerraLife®-BrassicaPro mix. In the trial that took place a bit further north in the Münsterland region, the SMARAGD variety from RAPOOL-RING GmbH

was sown as a companion crop. This variety features moderate growth before winter and does not tend to stalk. These are important qualities to safeguard the winter hardiness of oilseed rape, which is necessary to withstand heavy snow and the cold temperatures such as in February 2021. The oilseed rape was sown by a modified U-Drill from Kverneland. This universal seed drill has a short disc harrow that was modified so that the discs were arranged straight, a setup that disturbs only little soil. In our case, the companion crop plants that had emerged were damaged only minimally and grain volunteers were not stimulated to germinate. The result of the trial was convincing (see Fig. 3).

As weed pressure in the crop stand was very low, the testers did not require a blanket herbicide treatment. The volunteer cereals that emerged were treated with 0.7 litres per hectare of Agil-S (active substance: 100 g/l propaquizafop). Thanks to the mild weather and sufficient rainfall in autumn, the companion crop in particular developed very well, so that on 30/10/2020 the testers found a vigorous stand which was sufficiently masked by the oilseed rape (see Fig. 1).

After the winter months the companion crop, except individual clover plants, had effectively died off by March 2020 as anticipated (see Fig. 4). This is essential for the oilseed rape to start early in spring without having to compete with other plants for fertiliser.

**Fig. 2: 30 days after sowing the companion crop and immediately before sowing oilseed rape.**

**Fig. 3: The companion crop suffered only minimal damage thanks to the right sowing strategy.**

## Comparing oilseed rape performance in monocrop stands and in mixed stands

A number of differences were noted in the spring when comparing the monocrop oilseed rape stands with the companion stands. Some of the oilseed rape plants in the monocrop stand were much more strongly developed with vigorous taproots of approx. 15 - 20 millimetres in diameter. The oilseed rape in the companion stand was not as vigorous and there were fewer rape plants per square metre despite higher seed rates than in the single crop stand. This suggests that it is absolutely possible to sow the companion crop even as late as mid-August, provided conditions are optimal. In the companion crop stand, the surface was covered with more organic material due to the frozen legumes. The higher amount of organic material in the soil and the root ball of the companion crop stabilised the soil against erosion. Apart from that, the testers also observed increased earthworm and tunnel building activities in the companion crop field, which was attributed to the loosened top layer. Also, capping seemed to be less of a problem in the companion field than in the monocrop scheme.

The harvest this the summer will show whether the companion crop also shows differences in yields compared to monocrop stands. The question is, however, whether the primary aim of a companion crop should really be to increase oilseed rape yields or whether other factors such as increased diversity, stabilising the soil and bio-diversity in the crop rotation are of greater importance.

**Fig. 4: The photo shows the frozen companion crop in February 2021.**

### Initial findings from the strip trial

- Although barley is the first grain to be harvested in the season, it is a difficult crop in terms of straw, root exudates and the competitive strength of its volunteers, all of which make it difficult for companion plants to become established early on.
- As legumes develop faster, they fix more nitrogen but they also increase the competitive pressure on the main crop oilseed rape.
- Oilseed rape establishment in "live" stands requires special seed drills that only "clear" the seed row and leave the inter-row areas undisturbed.

A companion crop provides an intriguing option for growers looking for new farming and cropping strategies and at the same time it can add value to short rotations. Those who want reliable and uniform oilseed rape development in the autumn should continue growing oilseed rape as a monocrop. —

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