



# Technical Update 41

## Cover Crops & Legume Based Rotations

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The use of cover crops is valuable for many reasons including nutrient and water retention, weed suppression and improvement in soil structure, leading to improved agricultural sustainability. There is a variety of species combinations to choose from at varying costs.

Research papers reporting laboratory tests indicate that there are several species that can cause suppression of specific pathogens, and glasshouse investigations show the benefits of bio-fumigation on some soil pathogens. The use of biofumigant crops is well reported and there are specific agronomic, cultural and incorporation requirements advised to maximise their effect.

Legumes can be used in cover crop mixtures, and they can be very beneficial as they have good weed suppression characteristics and can aid soil conditioning. There is also the potential for nitrogen fixation, though cover crops need to be drilled latest in late summer, so temperatures are still suitable for nodule formation.

There is little recent research to direct growers to a particular species or mixture of species for maximum benefit to pulse crops or vegetable legumes. UK and European research on the use of cover crops to influence soil-borne disease control is at an early stage and there is currently little guidance available in relation to the benefits of individual species, or cover crop establishment and cultural practices. PGRO has undertaken research to evaluate suitable species to be grown prior to vining peas. Trials were conducted for 5 years, and black oat showed very good potential for improving soil structure and soil health. Positive effects on soil structure and water retention have led to yield improvements in several field experiments and no negative effects on peas have been observed.

Some pests and diseases are known to cross-infect between species within the same family. For this reason, where legumes are crops in the rotation, the recommended cropping interval is a minimum of 5 years.

PGRO is undertaking research to evaluate whether legumes can be used in cover or catch crops without any detrimental effects on the following pea or bean crops. So far, there is no evidence that the inclusion of winter vetch or Berseem clover in cover crops shows a detrimental effect on disease development. Data from literature suggest that inclusion of clovers should generally cause no problems with cross-infecting pathogens, and that winter vetch is a potentially safer option than common vetch, but caution should be applied with lucerne or lentils. Some PGRO data indicate that the inclusion of oil radish prior to vining peas should be avoided. Data on pest incidence is still lacking but to avoid potential issues with slugs, bean seed fly or weevils it is recommended that the cover crop be destroyed at least 6 weeks prior to drilling. PGRO continues to conduct trials using cover crops in vining peas and field bean rotations to strengthen our advice. Technical and summary reports on cover crops can be found on the PGRO website.

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