

## Cover crops in vining peas - some results from our second year trials

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Good soil health and structure are important for growing vining peas successfully. Intensive production can lead to structural issues like compaction of soils and can lead to soil microbial communities that contain larger numbers of plant pathogens and less beneficial microbes. One option to improve soil health and structure is the use of cover crops (defined as being planted in late summer in between cash crops and grown over winter to provide cover for soils) and catch crops (defined as being planted after harvest of cash crop and incorporated in autumn before planting a winter sown cash crop).

Four different cover crop treatments (Vetch, Oat + Radish, Oat + Clover, Oat + Phacelia) were grown overwinter and a control strip without vegetation was maintained. Cover crops were destroyed prior to drilling vining peas in spring 2018. Foot rot severity was assessed in the pea crop. At one of the field sites foot rot was first detected in a control strip. The soil here was a ploughed sandy loam with a confirmed risk of foot rot prior to drilling. Later on, the control exhibited significantly higher foot rot severity compared to cover cropped treatments (Fig 1). Biomass of peas also differed and control plots had 13% lower dry mass  $m^{-2}$  relative to the average of previously vegetated plots. Yield was significantly lower in control plots than in the plots with preceding cover crops (Fig 2). Cover crop treatments seemed to retain soil moisture. This in combination with potentially beneficial effects on microbial ecology may explain the positive yield response. In contrast, another site this year showed consistent yields across all treatments. This site was medium-heavy soil with a low foot rot burden.

After vining peas, the effect of catch crops on soil health and on following winter wheat crop development was examined. Three different catch crop

treatments (Phacelia + Radish, Phacelia + Clover, Phacelia + Buckwheat) were sown after pea harvest and a control strip without vegetation was maintained. Catch crops were destroyed prior to winter wheat drilling and in May 2018 dry weight of the wheat straw was recorded. Samples were taken from plots with preceding cover crops, preceding catch crops and overlapping sections. At two sites, catch crop mixes containing buckwheat appeared to have depressed straw (Fig 3) and ear weight. This may be due to allelopathic effects of buckwheat on competitor seedling germination. Buckwheat has been shown to suppress winter wheat germination given insufficient time between destruction and drilling (Kumar et al. 2011, Weed Science, 59:567–573). In our field trials, it also seemed to hinder the germination of phacelia in the seed mix.

Results from the first two years of trials indicate that cover crops can improve soil health and structure by reducing soil compaction, reducing nitrogen leaching, improving soil moisture, reducing effects of foot rot pathogens and improving pea yield. Results differ by field site and season and further trials will be conducted to increase robustness of observed trends.

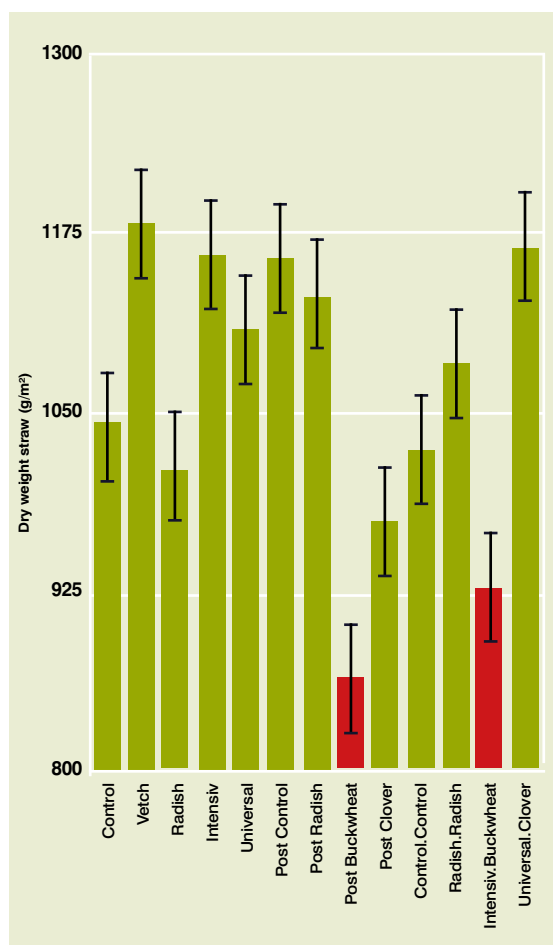


Fig 3: Straw weight (ww) following vining peas and cover/catch crops at Eastfield AR 2018 (sandy clay loam).

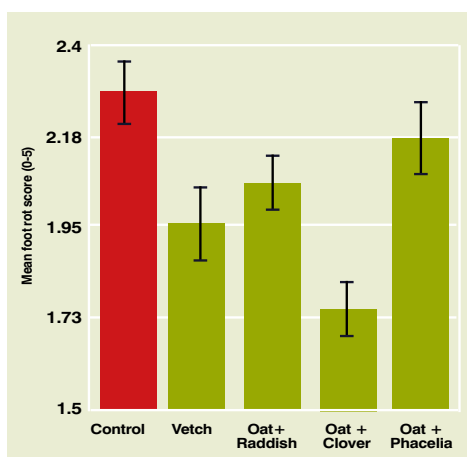


Fig 1: Foot rot severity in vining peas at Vicarage Hills 2018.

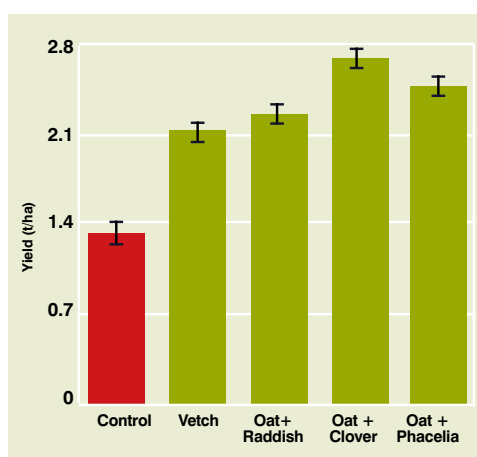


Fig 2: Vining pea yield at Vicarage Hills 2018.

PGRO, The Green Pea Company and Birds Eye have committed to a long-term project to investigate the effects of cover and catch crops on soil health in vining pea rotations. Funding has been secured for the first three years of the project from the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-Agri). Results from the first year of trials have been reported in the Vegetable Magazine 2017 edition. Here, some results from the second year of field trials are shown.