Brown Manuring of Lupins in Bolgart

Brown and green manuring of leguminous crops is a great way to control weeds, increase soil cover, improve soil fertility, conserve soil moisture and increase soil fertility. Adding legume mulch can also increase the levels of carbon within the soil.

Wheatbelt NRM has been working with Bolgart farmer Trevor Syme to find out if brown manuring of lupin crops can help improve his soil fertility, decrease the weed burden and improve the levels of carbon.

"In the past we have grown up to 50% of our cropping program to lupins as a cash crop and also as a legume for natural nitrogen. Now with the onset of chemical resistant weeds and drier rainfall years it has become uneconomical to grow lupins, but in saying that our highest yielding wheat crops are those that follow a lupin crop" says Trevor. This has led Trevor to look for other options for the wheat/lupin rotation. "It is all about a systems approach by rotating chemicals, crops and by using every tool in the shed too stay sustainable and profitable."

Trevor has opted for cutting the lupin crop with a knife roller as his preferred method of brown manuring. The residue is then left on the surface where it protects the sandy soil from wind erosion and helps reduce the soil moisture loss; to maximise the productivity of the subsequent wheat crop.

Trials carried out at three separate sites by DAFWA, have shown that soil organic carbon content can be increased by 1-3 years of green manuring, although rainfall has a big impact on the amount returned to the soil. Results from Trevor's trial will be analysed over the next couple of years to see the impact of the brown manuring on the soil fertility and soil carbon content.

Of interest to farmers contemplating earning soil carbon credits is the new Emissions Reduction Fund (ERF) method that the Department of Environment has recently released - *Carbon Credits (Carbon Farming Initiative— Estimating Sequestration of Carbon in Soil Using Default Values) Methodology Determination 2015*. Within this method is the ability to run sustainable intensification projects using default soil carbon storage figures that have been calculated using FullCAM (Full Carbon Accounting Model), which means that intensive field sampling is not required.

A sustainable intensification project must use at least 2 of the following activities to be eligible

(a) nutrient management;

(b) managing soil acidity;

(c) introducing irrigation;

(d) pasture renovation.

Based on this methodology, brown or green manuring leguminous crops in the paddock may be eligible, with the crop residue left in the paddock potentially counting as a nutrient management activity. As written in the method, a qualified person will need to approve these activities as appropriate techniques to improve nutrients within the soil. The nutrient management activity would need to be combined with another activity, such as managing the soil acidity. Combined, these approaches offer the potential to generate carbon credits, while also helping with soil fertility, weed management and soil moisture protection.

For more information on this method and others, visit the Clean Energy Regulator website at www.cleanenergyregulator.gov.au . Information on the trial being conducted by Trevor can be found on the NRM Sustainable Agriculture Trial and Demonstration sites at www.agtrials.com . Lupin crop