

A legume cover crop during the fallow can assist in reducing erosion while also improving soil biology and adding nitrogen to the soil.

Fallow management lays a solid foundation

*The steps for growing a good crop start long before the crop is even planted. In this article, SRA Adoption Support Officer **Gavin Rodman** explains some of the fallowing strategies that can help you plan to get the most from your farm.*

1. Planning the next crop

Record keeping is an important first step in successful farm planning as good records will take the guesswork out of managing your farm. Keeping records of all operations performed on an individual block will greatly assist the assessment of current, previous or newly adopted practices.

Soil tests are the only way of identifying the status of nutrients within a soil. These soil tests, along with record keeping, are the basis for developing a profitable and sustainable fertiliser program. An ideal time to conduct the soil test is during the fallow, with one sample per crop cycle usually being adequate. While the results of the soil test taken during the fallow are used to develop a fertiliser program for the following crop cycle, it is also the perfect time to determine if soil ameliorants (such as lime and gypsum) are required.

While taking your soil sample, it may be beneficial to consider the health of the soil. Research has shown yield decline in sugarcane is in part due to a build-up of harmful soil biota as a result of long-term sugarcane monoculture. It has also been shown that a break from sugarcane can reduce the numbers of the harmful biota with this effect increased by using a legume crop. One of these harmful soil organisms is the fungal root pathogen *Pachymetra chaunorhiza* which is responsible for pachymetra root rot. Although soil sampling for pachymetra involves a slightly different method to soil sampling for a regular soil test, it is beneficial to know the spore levels as cane yield can be greatly affected. The only way to treat pachymetra is by planting resistant varieties over a number of crop cycles.

2. Destruction of the previous crop

Traditionally, the stubble of the previous crop was destroyed by cultivation. However, this is no longer the preferred option. An emphasis is now placed on minimising the degree of cultivation and the potential for adverse environmental impacts within the new farming system. The main components of the new farming system include the use of controlled traffic, minimum tillage, and legume crop rotation.

The preferred stool eradication option is to spray out the previous crop with a suitable non-residual herbicide. This spray-out choice has a number of advantages including minimal soil erosion due to zero tillage, minimised offsite movement of nutrients with reduced soil movement, preserved organic matter and moisture in the soil, and also maintenance of the soil structure.

A downside to spray-out is that it may create weed control issues because the effectiveness of residual herbicides can be severely compromised by trash blankets.

3. Land rectification

The fallow period is an opportunity to do jobs that aren't possible during the crop cycle. It is a chance to develop controlled traffic systems and undertake drainage systems and headland management. The fallow period is also the perfect time to amalgamate and realign blocks, allowing for harvesting and farming efficiency by increasing row length.

4. Fallow management

Managing your fallow will involve a number of key tasks. The fallow period presents an opportunity to reduce emerged weeds and their seed banks as some weeds can be knocked out using herbicides that should not be used when a cane crop is present. Fallowing also helps to break pest and disease cycles. It is vital to ensure that the fallow is free of any cane including volunteer cane to make sure that these pest and disease populations can be reduced or eliminated.

A legume cover crop during the fallow can assist in reducing erosion while also improving soil biology and adding nitrogen to the soil. This management option is preferred over a bare fallow due to these added benefits.

5. Fallow versus replant

Fallow periods can bring benefits to the planning and layout of your farm, but they can also lead to improved yields and profits when compared to a replant system. The table below compares the performance of crops planted in 2008, 2009, 2010 and 2011 while demonstrating the differences in revenue per hectare over a crop cycle to third ratoon for fallow plant and plough-out replant systems in the Tully region. These figures were created from commercial yield (tc/ha) and CCS data for Tully from 2008 to 2014.

Table: Grower partial net return per hectare for fallow plant and plough-out replant systems to third ratoon comparing crop performance in Tully from 2008 to 2014.

Year planted	Plant	1R	2R	3R	Total \$/ha	Four-year difference (\$/ha) in favour of fallow plant
Fallow plant 2008	\$289	\$1,975	\$1,316	\$647	\$4,227	\$268
Replanted 2008	\$111	\$2,032	\$1,291	\$525	\$3,959	
Fallow plant 2009	\$212	\$1,356	\$966	\$1,689	\$4,223	\$860
Replanted 2009	\$20	\$1,427	\$588	\$1,328	\$3,363	
Fallow plant 2010	\$40	\$650	\$1,535	\$1,819	\$4,044	\$581
Replanted 2010	-\$193	\$543	\$1,436	\$1,677	\$3,463	
Fallow plant 2011	-\$600	\$1,587	\$1,850	\$1,813	\$4,650	\$471
Replanted 2011	-\$1,040	\$1,692	\$1,799	\$1,728	\$4,179	

Notes: Grower partial net return = gross revenue – harvesting and levies – fertiliser costs – planting costs. Crops were planted from 2008 to 2011, with the final planting reaching its third ratoon in 2014.



Above: Typical equipment used for soil sampling.



Above: Proper soil sampling lays the foundation for a productive crop cycle.