Spray out or slash legume crop

Spray out or slash fallow legume crop and leave residue on the surface until planting next crop.

Water quality

A legume crop rotation can be used in a sugarcane farming system. When the legume residue is left on the surface to break down, it provides benefits in retaining and utilising the nitrogen fixed by the crop. This can be achieved by slashing or spraying out the crop. If the legume trash is incorporated into the soil the potential for the leaching of nitrogen past the root zone of the sugarcane is increased. Leaching is more likely under wet tropical conditions or poor irrigation practices in drier climates (17S).

Costs and benefits

There has been no direct study undertaken to show the economic effects of spraying out or slashing a fallow legume crop. However, there have been numerous studies on the economic effects of including a fallow legume crop in an existing sugarcane production system.

Growing a legume fallow

Incorporating a fallow legume can improve farm profitability through improvements in cane yield and/or the sale of the legume crop. The improved sugarcane yield can be attributed to improved soil health, water infiltration as well as improved weed and disease control.

Profitability can be improved through a reduction of input costs such as nitrogenous fertiliser. Legumes also provide diversification to farm revenue if a legume crop is able to be sold. The additional costs of fallow legume cropping are generally outweighed by enhanced economic benefits.

Case studies conducted on several farms (in the Burdekin, Bundaberg and Herbert River regions) indicate that farming systems including a well managed legume fallow had improved gross margins and operating returns. It is important to consider the risks associated with growing a legume crop, which include possible crop failure. You should seek expert advice from an agronomist about the suitability of a legume crop for your individual situation (18S & 42S & 11S & 3S).

Regional studies

Demo farm in the Wet Tropics A 120ha demo farm in the Herbert district which incorporated controlled traffic farming with GPS, reduced tillage and a spray-out legume fallow practice, had the highest farm gross margin and operating return when compared to several other farms utilising a range of farming practices. These practices include conventional bare fallow and legume fallows, as well as conventional and zonal tillage practice. The improved profitability of the demo farm was attributed to less tractor operations with reduced fertiliser inputs and weed control costs.

Furthermore, labour savings in tractor hours were almost halved compared to the two conventional farming systems.
Burnett-Mary

A 2006 case study of a mixed cropping farm in the Burnett-Mary (943ha cane and 160ha peanuts), showed there are benefits in adopting improved management practices. The changes included controlled traffic with GPS, reduced tillage, scheduled flood irrigation and fallow legume cropping. The peanut crop was slashed, left on the ground and worked into the soil prior to planting the sugarcane. The study indicated a significant increase in gross margin over a projected 10 year timeframe with increases in labour efficiency and reduced tractor hours. Retaining peanut residue on the surface provided approximately 60 kg/ha of nitrogen. The tillage requirements for seed bed preparation were significantly reduced (11S).

There were no examples found in the sugarcane producing regions of the Mackay-Whitsunday and Burdekin of the economic impacts (either positive or negative) to a grower of specifically using the practice of spray or slash of fallow legume crop. It is expected that relevant information may be provided in the near future as further research is completed.

Sugarcane Extension Services

Smartcane BMP

This program assists growers to ensure their practices on farm are at industry standard. It was released in December 2013. It was developed by CANEGROWERS and funded by the Queensland Government.

Website: http://www.canegrowers.com.au/page/Industry_Centre/bmp/

Fertcare

This program is a joint initiative of the Australian Fertiliser Services Association and the Fertiliser Industry Federation of Australia. It provides training, quality assurance, certification and accreditation. The training program delivers training in managing food safety, environment and occupational health and safety risks associated with the storage, handling and use of fertilizer and soil ameliorant products.

Website: www.fifa.asn.au
Phone: 02 6230 6987 (Canberra)
Email: fertilizer@fifa.asn.au

Project Catalyst

Project Catalyst is a partnership between Reef Catchments NRM, the Coca-Cola Foundation, WWF and Mackay Whitsunday sugarcane farmers. The project has also expanded into, both, the Wet Tropics and Dry Tropics NRM regions. It aims to improve water quality and reduce the impact of pollution in the Great Barrier Reef, using innovative land practices.

Website: http://reefcatchments.com.au/land/project-catalyst/
Phone: 4043 8000 (Terrain Innisfail)
Email: info@terrain.org.au and/or belinda.billing@reefcatchments.com

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Sugarcane economic tools

Farm Economic Analysis Tool for sugarcane
Developed by the Department of Agriculture, Fisheries and Forestry, this excel spreadsheet is designed to assist growers in assessing the profitability in changes to their farm management practices.
Phone: 13 25 23 (DAFF)

Supplementary resources

SmartCane Best Management Practice booklet series
Developed by BSES, Canegrowers and EPA, this series of seven booklets provides an overview of general principles of best management practice related to various aspects of a crop cycle.
Phone: 3331 3333 (BSES Brisbane) 3864 6444 (Canegrowers Brisbane)

Wetlands management handbook
Farm Management Systems (FMS) guidelines for managing wetlands in intensive agriculture. Developed by the Australian and Queensland governments, as part of the Queensland Wetlands Program. The guide provides information to landholders and extension officers on:

- Identifying wetlands
- Wetland management
- Artificial wetland creation

The guide was designed to complement other industry FMS programs, for holistic farm management.
Phone: 13 74 68.

Why consider improved practices?

There are expected economic benefits for farmers in transitioning towards a system of improved management practices. This is based on economic analyses that have been undertaken on farming system practices in each of the sugarcane producing regions of the Wet Tropics, Mackay-Whitsunday, Lower Burdekin and Burnett-Mary.

Economic analyses have shown that it is possible for a farming enterprise to improve profitability whilst operating with improved management practices. It is recommended that you assess your specific farming circumstances before undertaking any practice changes.
Is there any evidence that improved practices have a benefit for my farm?

Wet Tropics study one
Economic studies in the Tully region have indicated that adopting improved management practices may be economically viable. Benefits included a higher gross margin and positive net present value. This was demonstrated when the farm transitioned from C class to B class management practices over a five to 10 year period (26S & 23S).

Wet Tropics study two
In 2004, modelling of a typical farm near Cairns showed that incorporating improved practices of reduced tillage, legume fallow and reduced nitrogen application leads to an increase in income levels. Although this analysis indicated a small reduction in crop yield, financial returns were enhanced through a reduction in tillage operations, increased efficiencies and inputs over a full crop cycle. Overall, operating with these combined improved practices provides important economic benefits to a farmer at the plot level and provides positive effects on profitability (30S & 32S).

Mackay-Whitsunday
Economic analysis of a 150ha demo farm in the Mackay region indicated that transitioning to a system of improved management practices may have a negative impact on profitability over the short to medium term. Results demonstrated a higher farm gross margin when adopting practice changes. However, the substantial capital costs may result in a negative return on investment in some instances. It is recommended you assess your specific farming circumstances before changing any management practices (5S).

Burdekin
Economic analyses of demo farms in the Burdekin region have indicated that adopting improved management practices may be economically viable. Benefits included a higher gross margin and positive net present value. This was demonstrated when a farm transitioned from C class to B class management practices over a five to 10 year period (21S & 22S & 24S & 25S).

Burnett-Mary
A 2006 case study of a mixed cropping farm in the Burnett-Mary (943ha cane and 160ha peanuts), showed there are benefits in adopting improved management practices. The changes included controlled traffic with GPS, reduced tillage, scheduled flood irrigation and fallow legume cropping. The peanut crop was slashed, left on the ground and worked into the soil prior to planting the sugarcane. The study indicated a significant increase in gross margin over a projected 10 year timeframe with increases in labour efficiency and reduced tractor hours. Retaining peanut residue on the surface provided approximately 60 kg/ha of nitrogen. The tillage requirements for seed bed preparation were significantly reduced (11S).
More information

If you would like to contact DAFF about the information presented in this factsheet, contact us on: 13 25 23, for the cost of a local call within Queensland, or 07 3404 6999, or email us at; ReefPlan@daff.qld.gov.au
References


3S) Department of Agriculture, Fisheries and Forestry (2007), Bundaberg Grain in Cane, Canegrowers Case Study. Department of Agriculture, Fisheries and Forestry, Canberra.


Spray out or slash legume crop

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