

Vetch Rotation

On Farm Series: Nutrition | Produced by Cotton Catchment Communities CRC

Vetch – a legume that increases cotton profits

Vetch has been grown on commercial cotton farms for several years in most cotton growing regions. To evaluate the benefits of growing vetch Dr Ian Rochester and his team at CSIRO Plant Industry in Narrabri have conducted extensive field trials to identify just what vetch has to offer cotton farmers. .



Vetch being slashed in late winter prior to incorporation into the soil

Growing vetch

Cotton growers have adopted three ways to incorporate vetch in rotation with growing cotton:

1. Cotton–vetch–fallow rotation

Vetch is sown after the cotton crop is harvested around May. It is grown through winter then slashed and ploughed into the soil as a green manure crop in spring. The soil is then left fallow until cotton is sown the following spring.

2. Cotton–vetch–cotton rotation

Vetch is sown as soon as possible after cotton is harvested in May. It is grown through winter then slashed and ploughed into the soil as a green manure crop in late winter to early spring. Cotton is then resown in spring.

3. Wheat–vetch–cotton rotation

Vetch is sown in late February through to May following wheat harvest in December. It is then slashed and ploughed into the ground as a green manure crop in mid to late winter. Cotton can then be sown in spring.

The trials also showed that it was best to incorporate vetch at least one month before cotton was sown to allow some decomposition of the vetch stubble. Herbicides did not aid destruction of vetch.

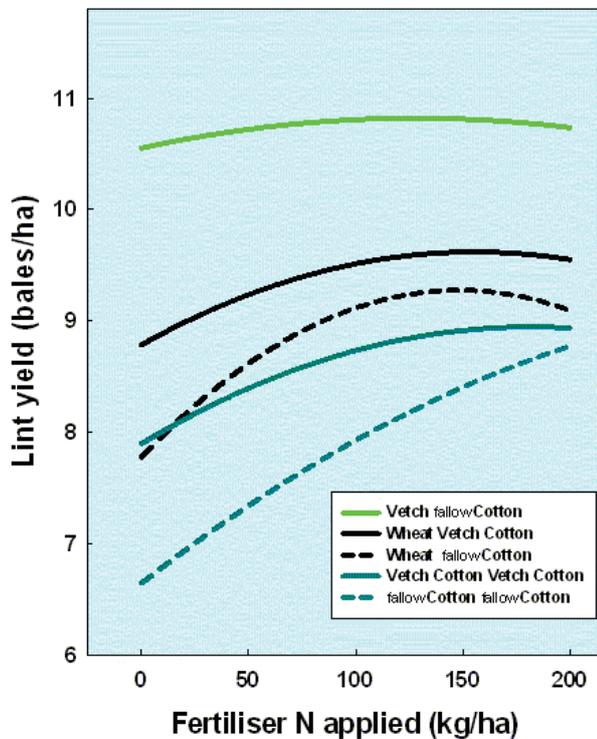
Increased nitrogen

Vetch is a winter growing legume which, like other legumes, can take nitrogen from the air and 'fix' it in the soil so it can be used as a fertiliser by the plant.

Dr Rochester's team compared growing vetch in a cotton rotation with other legumes commonly used in rotation with cotton including faba beans, field peas, clovers and medics. Vetch's ability to fix nitrogen far exceeded all the other legumes, commonly fixing up to 200 kg of nitrogen per hectare.

The graph below shows the higher yields obtained when vetch was used in various cotton rotations. Note the greater need for nitrogen fertiliser with the continuous cotton and wheat rotation systems, especially where vetch was not grown.

Within a continuous cotton system where cotton was planted year after year, growing vetch



reduced the amount of nitrogen fertiliser required for cotton by 140 kg per hectare to achieve maximum yields. Coupled with increased yield, the gross margin per hectare for this system was increased by \$390.

Similarly, where a wheat - cotton rotation included vetch, less nitrogen fertiliser was required and a greater yield was produced, compared with not growing vetch. Here the gross margin increased by \$270 per hectare.

The vetch – fallow system has been the highest yielding system identified so far, and has increased gross margins by up to \$540 per hectare.

Although vetch is not an income producing crop itself, the \$100 per hectare cost of growing it is

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substantially outweighed by the financial benefits accrued for the following cotton crop.



Vetch - offering farmers increased profits

Better soil

Declining soil organic matter is an issue across all cotton growing regions. Incorporating vetch stubble adds organic matter to the soil and over the last eight years of the CSIRO Plant Industry trials the organic

matter levels in cotton fields in rotation with vetch increased by 14 per cent.

Another important advantage of vetch observed by Dr Rochester and his team was that cotton grown after vetch was better at taking up important nutrients, such as nitrogen, phosphorus, potassium, zinc and copper, while sodium uptake was reduced to the crop's benefit.

Soil structure was improved after vetch, making cultivation easier, as well as root penetration and growth. This, coupled with increased water holding capacity of the soil, aids the cotton crop to access more water.

Vetch is also an excellent break crop that reduces the incidence of Black Root Rot in those areas where the fungal disease occurs.

Vetch, like most other rotation crops, may increase Fusarium wilt, so fields should be carefully assessed before it is used.

Available varieties

Two varieties of vetch, Namoi Woolly Pod Vetch and Capello generally performed better than other varieties in the CSIRO Plant Industry trials.

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