

To crop or not to crop?

Recent modelling work completed under a joint DairyNZ/AgResearch project suggests that the economics of growing summer crops is highly dependent on yield and the value placed on pasture renewal.

Summary:

- Breakeven yields for maize are 23TDM/ha where pasture renewal is not required and 20TDM/ha if the paddock requires regrassing
- Break even yield for turnips are 11TDM/ha where pasture renewal is not required and 10TDM/ha if the paddock requires regrassing
- Crops grown on effluent paddocks require no or little additional fertiliser and therefore have potentially lower growing costs
- Cropping has the potential to improve the effectiveness of pasture renewal
- Successful cropping requires expertise and good timing.

The break-even yields for maize and turnips at a \$5.10 payout are 23tDM/ha and 11tDM/ha respectively. Yields below these break-even points will be uneconomic unless the crop is being grown for reasons other than providing a cost effective source of additional feed.

Three years of trial results carried out on the DairyNZ Super Productivity farm yielded an average of 20.5tDM/ha plus 5 tonnes DM/ha from annual ryegrasses. Research findings under the "More Summer Milk Project" in the 1990s also found that the range in turnip yields was 6.5t-11.0M/ha. Hence, the break-even yields are challenging.

The reason the break-even yields are so high is that there is an opportunity cost in the form of pasture not grown while the paddock is in crop. It is the net gain in yield between pasture and crop that has value in the whole farm system. Seasons when you grow great crops also grow more pasture.

Reasons other than providing additional feed include pasture renewal or re-contouring a paddock. Cropping can be an effective method for establishing new pastures as it provides a weed break and can improve the introduction of novel endophyte. If the crop paddock is due for pasture renewal and this cost will be incurred, regardless of whether it is cropped or not, then the breakeven yields are reduced to 20t/ha for maize and 10t/ha for turnips.

This analysis assumes that maize is grown in effluent paddocks or out fertile pasture and hence requires no additional fertiliser inputs. This analysis also assumes that there is a genuine feed surplus at the time of spraying out the paddock and hence the integration of a crop does not penalise spring/summer production.

Successful cropping also requires expertise and good timing. If you are dependent on contractors good communication is critical. A one day delay is estimated to reduce maize yields by 1% of final yield. Ten days equals 10% loss of yield and often the difference between a profitable or non profitable crop.

Partial budget analysis

Partial budgets are useful to assess the cost of the additional feed grown by a crop over and above what the existing pasture would grow. In situations where higher crop yields are expected higher amounts of pasture would also be expected.

Maize

| | | | |
|--------------------------------------------|--------|--------|--------|
| Yield | 16t | 20t | 24t |
| Loss of pasture | 7t | 8t | 9t |
| Net Increase in DM | 9t | 12t | 15t |
| Growing & harvesting costs (no add'l fert) | \$2800 | \$2800 | \$2800 |
| Regrassing | \$800 | \$800 | \$800 |
| Total costs | \$3600 | \$3600 | \$3600 |
| Cost/KgDm | 40c | 30c | 24c |

Note: Utilised in the spring. At a 50gMS/kgDM response the breakeven cost is 26c/kgMS.

Turnips

| | | | |
|--------------------|--------|--------|--------|
| Yield | 10t | 12t | 14t |
| Loss of pasture | 5t | 6t | 7t |
| Net increase in DM | 5t | 6t | 7t |
| Growing costs | \$1000 | \$1000 | \$1000 |
| Regrassing | \$800 | \$800 | \$800 |
| Total costs | \$1800 | \$1800 | \$1800 |
| Cost/kgDM | 36c | 30c | 26c |

Note: Utilise in summer/autumn. At a 70gMS/KgMS response the break even cost is 36c/kgDM.

Whole farm analysis

Farmax has been used to assess the whole farm impact of growing maize on the dairy farm. This analysis factors the utilisation of pasture eaten or harvested under cropping and non-cropping systems.

