DairyNZ

Profitability. Sustainability. Competitiveness.

Popular cropping options for dairy farmers

Errol Thom & Julia Lee

September 2013

Outline

- General comments
- Summer crop options to secure feed supply
  - Turnips
  - Maize
  - Chicory
  - Plantain
- Profitability?
- Further information?

Pasture growth on seasonal dairy farms

- Perennial ryegrass / white clover
- Low cost
- Variable in quantity and quality
- Yield limit ≈ 20 t DM/ha/year, “feed barrier” ≈ 15 t DM/ha/year eaten
- Summer milksolids (MS) most affected

Role of crops

- To provide extra feed:
  - when pasture growth is slow (summer / autumn / winter) or
  - when quality of pasture limits food intake relative to cow requirements
- To complement pasture renewal programmes e.g. break insect life cycles, control weeds
- To utilise excess nutrients (N + K) in effluent areas
- Reducing over-grazing of pasture during summer

Cropping

- Crop forage is expensive relative to pasture
- Profitability = **high** crop yield
- Risk of failure is **high**
- Successful cropping = careful planning
- Shortcuts will be costly
- Crop failure intensifies feed shortages

DairyNZ

Cropping

- Correct deficiencies (e.g. drainage, soil fertility) of poorest paddock **before** cropping
- High yields are difficult off worst paddocks
- Crops = ‘peace of mind’?

Summer Turnips

- Use high yielding varieties e.g. Barkant

  10-15 t DM/ha (October to March)

- National survey 1994/95 (Clark *et al.* 1996) average 7.4 t DM/ha (range 0-15 t DM/ha)

- 12.5 t DM/ha (range 10-16 t DM/ha) for farmers who used best management practices vs. 11 t DM/ha (Eerens and Lane 2004).

Summer Turnips
"More Summer Milk" Waikato

- Turnips produced 23% more DM and occupied 8% of farm
- Turnips increased **total farm** yield by 2%
- Penalty effect of introducing turnips:
  - Lower pasture cover
  - Lower cow condition
  - Lower daily MS production

DairyNZ

Summer Turnips: summary

- High turnip yield, high pasture yield
- Average turnip yield is too low to overcome the penalty effect
- Will not overcome “feed barrier”
- Profitability?

Maize

- New varieties (hybrids) silage yield = 20-26 t DM/ha (mid-October to March)

- Maize silage
  - low crude protein (8%)
  - 30% of cows diet, rest pasture

Maize Silage

- Double crop with oats:

	Plant	Harvest	Yield (t DM/ha)
Oats	Early April	Early October	10 - 12
Maize	Late October	Late March	20 - 22
Total silage yield (t DM/ha)			**30 - 34**

Maize Silage & Oat Silage (Clark *et al.* 2001)

- Double crop on 22% of farm
- Remainder: perennial ryegrass / white clover
- Maximises farm yield (23.3 t DM/ha)
- Optimal crude protein (16%) for cows

Maize Silage & Oat Silage (Clark *et al.* 2001)

- Compared with pasture + N yielding 20 t DM/ha/year (Penno *et al.* 1996)
- 16% increase in yield
- Profitable

Maize Silage

- Feed when true deficit exists
- Profitable responses
- **Decision rules**

  Feed when cow intakes of pasture are:

  < 15 kg DM/cow/day (early lactation)

  < 12 kg DM/cow/day (late lactation)

Chicory

- Good drought tolerance (tap root)
- Yields:
  - 10.5 t DM/ha (spring sowing to May) (Range 7.5 – 15 t DM/ha)
  - 12.0 t DM/ha (2nd year, Sept. to May) (Range 9 – 17 t DM/ha)
- Persists for 1-2 years under dairy cow grazing
- High herbage quality and mineral content

Plantain

- Moderate drought tolerance
- Yields:
  - 11 t DM/ha (spring sowing to May)
    (Range 7.5 – 13 t DM/ha)
  - 16.0 t DM/ha (2nd plus year)
    (Range 10.5 – 19 t DM/ha)
- Persists for ~3 years under dairy cow grazing (or more?)
- High herbage quality and mineral content

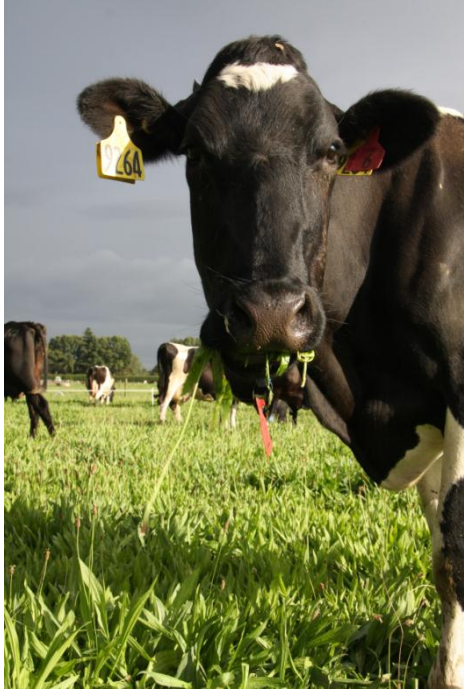
DairyNZ

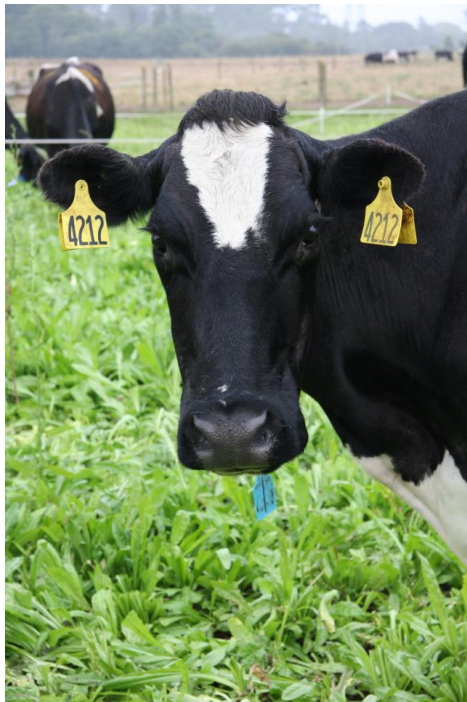
Chicory or plantain?

- Both less susceptible to insects than turnips
- Desired crop lifetime?
- Problem weeds on-farm?
  - Flumetsulam herbicides registered for chicory
- How dry does your farm get?
- Winter feed?
  - Plantain can be grazed (15-35 kg DM/ha/day)
  - Chicory should not be grazed, need alternatives e.g. supplementary feed, grazing off, sow annual or Italian ryegrass

Milk production

- Feeding herbs increases milk production
- The milksolids (MS) response appears to depend on pasture quality:
  - If quality is good (>10.5 MJ ME/kg DM) then MS was similar
  - If quality is poor (<9.5 MJ ME/kg DM) then MS was increased by ~17%





Comparison of options

	Turnips	Chicory	Plantain	Maize
Average yield (Oct. – March)	11	10 *	10 *	22
Establishment costs ($/ha)	850 - 1400	900 - 1300	900 - 1300	2800 - 3800
Grazing	Once	Rotational	Rotational	As required
Energy (MJ ME/kg DM)	12 - 12.5	12 - 13	11 - 12	10 - 11
Protein (% DM)	12 -18	16 - 27	16 - 27	8

* Chicory crops may remain in place for a further year, while plantain crops may remain for another 2 or more.

Crops and profit – key points

- Understanding crop requirements
- Good soil drainage & fertility before cropping
- Proportion of farm in crop
- Amount of pasture lost

Crops and profit – key points

- Crop yield + cost / kg DM
- Milksolids response to crop fed
- Feeding crop when a **true feed deficit** exists – minimising substitution and pasture wastage
- To benefit from cropping pasture monitoring is essential

Further information

- Regular monitoring allows evaluation of options for stock and feed
- Farm advisors
- DairyNZ website (www.dairynz.co.nz):
  - Dry summer management guide and action plan
  - Farmfacts on different crops, summer management, N fertiliser, heat stress, once-a-day milking…