TechnoGrazing™ – a new grazing concept

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Abstract

The Technosystem intensive grazing system, now called TechnoGrazing™, was developed by Rangitikei farmer, Harry Wier, during the past 25 years and is being adopted successfully on New Zealand pastoral farms. The TechnoGrazing concept is a most effective advance in subdivision and grazing management, achieving very intensive and efficient pasture utilisation, with a quantum leap in animal production. It requires only a minimum investment in plant and equipment, a low labour input, and is a sustainable grazing system when practised properly. Pastoral farmers using TechnoGrazing systems in different regions are now achieving greater profits and impressive results, especially for dairy beef and sheep finishing, and several examples are described.

Keywords: controlled grazing, intensification, liveweight gains, pasture utilisation, Techno-Grazing

Introduction

Farmlet-based research led by Brougham (1970) showed that grazing management could significantly raise production levels in dairy bull-beef production (Brougham *et al.* 1975; Brougham & Cosgrove, 1985). Brougham's research encouraged Harry Wier, a Rangitikei farmer, to develop a new system for bull-beef production based on Brougham's findings, and commercialised this concept as TechnoGrazing™ in 1992.

TechnoGrazing boosts animal/pasture productivity, because:

- Small animal groups are less stress-prone than larger groups.
- More frequent fresh pasture stimulates animal appetite and provides a more consistent diet.
- Pasture-related animal disorders, such as facial eczema, bloat, and internal parasites, are reduced.
- Concentrated animal impact and closer grazing reduce pasture pest and diseases effects.
- Nutrient recycling efficiency improves through more even droppings spread.
- Treading damage and animal exertion are reduced (water and forage are more accessible).

With TechnoGrazing, the farm is divided into a grid of grazing cells, each usually less than 0.1 ha, by permanent and temporary fences with fibreglass posts. Permanent fences are used to form long narrow lanes, and temporary fences are placed across these lanes to form the cells. The cross fences can be erected or dismantled easily and quickly, either manually or from a "quad" farm bike at speeds approaching 10 kmph. Such vehicles are modified with simple bars that enable driving over the fences, which spring back into place. Mr Wier also developed a new watering system based on portable troughs or, more latterly, permanent "micro-troughs".

Precision rotational grazing allows an increase in stocking rate without sacrificing average winter pasture cover. Intake is restricted and post-grazing residuals are very low, but a long recovery ensures good cover is maintained on most of the area. In addition, small subdivisions:

- Allow finer control of important variables in grazing management (grazing and recovery periods, and pasture residual).
- Enable secondary forages to be used that need special management (lucerne, forage crops, shrub and tree forages).
- Allow more intensive animal health and performance surveillance.

On-farm application

Mr Wier's company, Kiwitech International Ltd, has trained many farmers from a very wide geographical spread in an intensive three-day course to apply TechnoGrazing effectively on their own properties. A cost-benefit analysis of traditional and TechnoGrazing systems for beef finishing (Ogle & Tither 2000) has shown that the new system significantly lifted return on total capital invested. In addition to dairy bull beef, TechnoGrazing has been applied to heifer grazing, winter and summer lamb finishing, breeding ewes, and Merino wethers under low rainfall. Various types of irrigation (border-dyke, guns, K-line, centre pivots) have been integrated with the system. Applications

that are currently being developed include integrating breeding ewes and yearling bulls, deer finishing and organic bull beef production.

The system responds particularly well to tall-growing pasture types and there is extensive experience with traditional ryegrass pastures, and those based on tall fescue, prairie grass, annual ryegrasses, lucerne and chicory. While the system is cheaper and more labour-efficient on flatter ground, it also works well in hill country, although care is needed with more sensitive soil types on steeper land. Wet soils will be prone to treading damage under any form of management, but prudent TechnoGrazing is less damaging, hoof for hoof, than any other grazing system. As with any tool, its effective use depends on correct and commonsense application. A common misconception, that it is very specific and inflexible, is unfounded. TechnoGrazing systems offer more grazing options and applications than any comparable grazing system. With regard to environmental consideration, TechnoGrazing has been operated commercially at Mr Wier's farm on the same pastures for over 20 years and has proved to be a reliable, profitable and highly sustainable concept.

Farmer experience

Jamie Gunson, Tahunga, Onga Onga, Hawke's Bay
This farm receives 875 mm rainfall (ranging from 550–1250 mm) and is summer-dry. Mr Jamie Gunson has converted 620 ha of his property over the last 5 years to dairy beef production using TechnoGrazing, with an overall aim of increasing profitability to consistently achieve more than 10% return on capital. He has 7750 pasture cells, all at 0.08 ha each, and has removed almost all his stock dams after installing micro-troughs fed from a large dam nearby. All monitoring is undertaken by computer technology, with 70% of the bulls weighed regularly. Soil and pasture measurements are taken along the first lane of each TechnoGrazing block. Mr Gunson has stopped feeding any supplements and making hay or silage, as the all-grass system produces enough feed for his stock.

Duncan Holden, Forest Gate, State Highway 50, Onga Onga, Hawke's Bay
Mr Holden runs dairy bulls, deer and sheep on 340 ha at Forest Gate next to Jamie Gunson and 200 ha on a nearby block at Ashley Clinton (with 2000 mm annual rainfall). Mr Holden runs four bull technosystems, two on rolling hill pastures and two on flatland, with part-time assistance. Though the flat land is usually more productive, one hill technosystem has produced more – attributed to management decisions. In 1993 he began irrigating the flatland pastures with a gun system and sowing pastures with tall fescue-based seed mixtures. These have proved to be successful and respond really well to the K-line irrigation, which he has more recently installed.

Mr Holden used to buy in weaners at 100 kg, sell the best stock at 15 months and the remainder at 2 years. He ran his one-year bulls over winter on forage oats at heavy stocking rates (17 bulls/ha), with a twice-daily chore of moving the electric fence 50 cm forward, but the bulls dug up ground, broke fences and were hard to manage.

He changed to TechnoGrazing 6 years ago and now runs bulls at double the stocking rate, without crops or conserved grass, but with half the work. Animal production has also doubled, with daily liveweight gains of more than 2 kg/ha. In his worst year, he recorded 800 kg liveweight gain/ha, 45% better than in his previous system, and during his best year he recorded over 1600 kg liveweight gain/ha.

John Hudson, Gwavas Station, Tikikino, Hawke's Bay
Mr Hudson farms 1120 ha at Gwavas, part of which is managed under dryland TechnoGrazing. The first system was installed 10 years ago and it was the first to be developed after Harry Wier's own system. Pasture pests, especially grass grub and the Tasmanian grass grub, can seriously deplete the Gwavas pastures, and ryegrass staggers affects livestock production seasonally.

Since August 2000 Mr Hudson has run bulls at 4.14 per ha and gained returns exceeding $2000/ha from his system (Taylor 2001). His high-performing bulls went onto the TechnoGrazing system in August 2000 at 402 kg and were slaughtered in mid-November and early December. He expects to make an economic farm surplus of more than $1600/ha from his TechnoGrazing operation this year. Gwavas Station was recently used for a Sustainable Land Management project (Rhodes 1999), and TechnoGrazing was approved as a sustainable land management system.

Angus Mabin, Taniwha, Highway 2, Waipukurau, Hawke's Bay
Mr Mabin farms 655 effective ha on the Takapau Plains near Waipukurau, including 167 ha of rolling hills. Mr Mabin began his first technosystem in 1997 and is now running dairy bulls on 578 ha; deer are managed conventionally on 77 ha. The farm used to be subdivided into 6–10-ha paddocks, set-stocked by beef cattle at 10–25 per mob (0.6–0.75/acre), and feed shortages occurred every winter. The system required excessive labour and was encouraging weed invasion, even in the browntop-dominant pastures.

He now stocks his systems at 3.5–3.7/ha of 400-kg bulls, buying yearling bulls throughout the season – the first ones at around 300 kg and the last ones at 450 kg. Animals are sold as pastures become dry, and stocking is minimised until the autumn break. During the winter, the young stock grow at 0.6–0.75 kg/day, stocked at up to 1000 kg liveweight/ha, whereas older animals grow at 0.3–0.4 kg liveweight/ha, stocked at 1400–1500 kg liveweight/ha. The finishing target weight is 600 kg liveweight. Mr Mabin now observes his stock every 2 days, disease prevention is much better and animal health has greatly improved. He considers TechnoGrazing really comes into its own when the scale justifies a second labour unit.

Nick Prendergast, Arohena, South Waikato

Mr Prendergast runs a beef technosystem with a dairying system as separate operations on 146 ha of rolling upland hill pastures. He runs Hereford bulls for sale as dairy cow sires to Waikato dairy farmers. He practices Technograzing on an area that offers only limited access to his dairy herd, because of a dividing gully. He converted his bull unit to TechnoGrazing in 1993 and has doubled his stocking rate from 1.5–2.0 bulls/ha to 5 bulls/ha following the change. He now runs 220 bulls, stocked to maximise the spring pasture growth peak before they are sold during October–December.

Andy Scoular, Threave, Poukawa, Hastings, Hawke's Bay

Mr Scoular farms 380 ha of flat, rolling and steep dryland near Havelock North, with 800 mm annual rainfall (only 400 mm during 2000). The operation is 50:50 Angus/Hereford breeding-finishing cattle and mainly Romney sheep. He operates 16 ha under TechnoGrazing on rolling land with sheep, and has regrassed it twice with Italian ryegrass to increase winter growth. The hoggets are bought in March and finished from June onwards, as they reach 45 kg target liveweight. He can carry more hoggets in early September, when grass growth is accelerating, enabling him to sell when prices are peaking. He also finds it a much cleaner system, in terms of parasite burdens, and this saves drenching cost and effort.

Mr Scoular has modified the specified TechnoGrazing system to suit sheep, and subdivides at 100 m width, setting the temporary fences at 50 m apart, running two mobs of 150 hoggets (increasing to 300 per mob in spring). He moves them every 2 days on around a 28-day rotation during winter, and follows the sheep with cattle to clean up any taller residual pasture. Mr Scoular reports that TechnoGrazing combines well with regrassing to boost his farm income.

Jerry Rowley, Loganburn Station, Ranfurly, Central Otago

Jerry and Shirley Rowley farm Loganburn Station near Ranfurly, Central Otago, on 2025 ha with a short growing season due to the 550–950 m altitude and 460 mm rainfall. The station comprises 650 ha of variable flatland, 650 ha of tussock grassland, and an upper plateau at 900 m asl. The Rowleys installed K-line irrigation on 84 ha in September 1999 and began TechnoGrazing on 36 ha. Loganburn Station carried 500 deer, 5000 merinos and 150 cows when purchased in 1996. They now carry 900 deer, 5000 merinos and 450 cattle (180 cows). Under TechnoGrazing, 270 cattle are finished each year, compared with 140 beforehand. The bulls are stocked at 5.5 yearling bulls/ha and have produced approximately 650 kg beef carcass/ha, with a further potential to increase this production through fertiliser application. Cow numbers have been increased on the farm, supplying more stock for TechnoGrazing. The property is developing well and Mr Rowley reports that its full potential will be realised within 2–3 years.

Common findings by TechnoGrazing farmers

The new system enables much better pasture feed utilisation, with higher sward covers and more grass-growing time, higher feed quality and a lower incidence of pasture-related livestock disorders. Because the bulls are run in small groups with a stable routine, food conversion rates are improved. Though existing pastures can change rapidly to ryegrass when TechnoGrazing begins, renovating older pastures helps to gain the last 10–15% from the intensive system.

Table 1 Production gains from TechnoGrazing on several farms.

Farmer	Before TechnoGrazing	After TechnoGrazing
J. Gunson	11–12 stock units/ha 550–560 kg liveweight gain/ha	25 stock units/ha 1190 kg liveweight gain/ha
D. Holden	0.5–1.9 bulls/ha	1600 kg liveweight gain/ha 3.5–3.7/ha
A. Mabin	0.5–1.9 bulls/ha	3.5–3.7/ha
N. Prendergast	110 bulls (1.5/ha)	220 bulls (5/ha)
J. Rowley	140 bulls finished (3.9/ha)	270 bulls finished (7.5/ha)
A. Scoular	540 kg liveweight gain/ha	900 kg liveweight gain/ha

Future prospects

Although some exciting productivity benchmarks have already been set, Mr Wier and the farmers using TechnoGrazing feel they are still "scratching the

surface" of the system's capacity. The inherent replication within the system gives it huge potential for scientific research. Pasture systems are so complex that the only way to establish the effectiveness of any new approach, such as pasture cultivars, endophyte strains, fertility treatments, and animal genetics, is through a replicated farmlet-scale trial, and TechnoGrazing offers a perfect template for this approach.

The terms "intensive" and "sustainable" are usually regarded as antitheses, because *intensive* is associated with heavy energy, machinery, fertiliser, and chemical use, nitrate leaching, animal stress, soil damage and a generally synthetic, non-biological approach. While TechnoGrazing is intensive in terms of subdivision and stocking rate, and can be practised *intensively* in that less desirable sense, there is nothing to compel farmers to do that, and every reason not to.

Pasture-based ruminant protein production is relatively natural, healthy, safe and sustainable, and logically, New Zealand farmers should play that marketing card. Good chemical-free production needs precision management of animal nutrition, pasture rotations and specialist forages – the very things that TechnoGrazing offers. Even under organic production rules, TechnoGrazing can achieve very high productivity without "mining" the environment.

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