Sustainable grazing boosted by beds

By Georgina Wilson

Gary Peacock is a really happy man. In the last year (2003) the Land, Water & Wool Sustainable Grazing on Saline Lands (SGSL) project on his property has yielded his best annual pasture yet, plus a barley crop that is providing a massive feed bonus for his sheep.

Through the Evergreen Group, Gary proposed a trial of raised beds which was approved in the first round of Land, Water & Wool SGSL projects in Western Australia in mid-2002. Land, Water & Wool is a national research initiative between Australian Wool Innovation Limited and Land & Water Australia. Then followed a precise contour survey with a differential GPS surveying system and the design and construction of a series of drains to remove run-off and root zone drainage, supervised by researcher Greg Hamilton.

“We surveyed a much larger area than the immediate trial paddock (75 hectares) to see where the water was moving and then selected the site, a compromise between the best and the worst land on the farm,” Gary commented. “Layout was designed in March 2003, followed by fencing and earthworks in May.”

Over the year Gary has discovered one of the harsh realities of research. Six weeks of unexpected dry weather in May and June delayed bed forming which required a machine from the Department of Agriculture. Shortage of pasture seed was another hurdle, so rather than wasting a year, a third of the trial paddock was sown to Moondyne barley in early July – a local variety available from a mate.

Gary Peacock has always been concerned about salinity. Being only 14 kilometres from the coast, regular sea breezes and rain-bearing fronts that cross his property are laden with salt. Bare patches of ground and extensive areas of sea barley grass indicate hazardous areas.

His property is second to lowest in the catchment and receives considerable run-on drainage. It is very flat, and its sand over clay soils are often waterlogged and flooded for long periods in winter. Before Gary moved shearing from September to November, teams often had to leave their cars and wait to be ferried 1.5 km on a tractor and trailer to make it to the shearing shed.

The waterlogging makes cropping very difficult and various attempts at drainage had little success. The Evergreen Group has been experimenting with sub-tropical pastures to use excess water stored in the soil over winter, but Gary’s summer grass production has been poor, possibly affected by salinity.

For him, raised beds are now looking better. He has the option of both cool and warm season pastures without the problem of waterlogging. The sub-tropical component needs to be re-sown because the 2003 sowing was too late and spring too dry for reasonable establishment.

Whether the impromptu barley or the winter pasture of Balansa clover, Seaton Park and Trikkala sub clovers and four ryegrasses has done better, it is difficult to tell.

“Our barley planting was late, and not pasture-topped,” Gary said. “So I’m not too fussed about the actual yields. The fact that this land yielded a reasonable crop despite the agronomic difficulties is amazing.”

Being normally a livestock producer only, organising harvest of 25 ha of crop was another challenge, not possible until just before Christmas. By then, some shedding combined with a non-stop buffet for large numbers of local emus reduced yield to 31 tonnes of grain or 1.35 tonnes per hectare. This went into a farm silo and was being fed out in January, improving the nutrition of ewes prior to joining, and helping carry the last of his lambs through summer.

“For people in regular cropping country, this mightn’t sound too special, but in this

Case study: Gary Peacock (and Evergreen Group through SGSL)

Location: Bibby Springs, 220 km north of Perth, WA
Farm area: 1730 ha
Average rainfall: 550-600 mm falling May-October
Enterprise: 7000-8000 sheep for wool

Photos: Georgina Wilson, NDSP WA
area it was fantastic,” Gary said. “By comparison, the barley grown on the control area without the beds just wasn’t worth harvesting.”

The winter pasture grasses grew to nearly a metre and clovers to half a metre. Both stubbles and pasture have provided valuable extra grazing, when Gary normally has to buy in lupins to feed stock over summer. Despite concerns that the beds could be a stock hazard, both the sheep and uninvited emus have tended to follow the furrows, resulting in less damage to the beds than expected. Moving stock on and off has not been difficult. “There are many advantages in combining crops with livestock,” Gary commented. “People take it for granted, but with cropping there is automatic pasture regeneration, you break the cycle for worm control, and the stubbles provide useful feed. Using the raised beds, it looks like we can break into this system for the first time.”

• Georgina Wilson is NDSP Communication Coordinator (WA)

The science behind the story
Nurturing soil is crucial for raised beds

By Greg Hamilton

Dramatic boosts to crop yields and profits achieved by large-scale field research have generated widespread interest in raised beds during the last few years. More farmers are adopting them each year, particularly in the Esperance area of the WA south coast.

This success has fuelled optimism that the concept of raised beds may well rehabilitate moderately saline land.

Evergreen Group used the opportunity of Land, Water & Wool Sustainable Grazing on Saline Lands (SGSL) funding to become the first farmer group to run a research project involving raised beds. More groups have followed, and the ‘producer network’ established with this funding now has nine projects involving raised beds.

Principal Research Officer Greg Hamilton believes the Badgingarra sandplain on which Gary Peacock’s property is located, is potentially another ‘Esperance’ in terms of success of raised beds.

He describes raised bed farming as a package of soil and surface water management practices that creates a porous seedbed that drains and aerates the top 30 centimetres of the root-zone – nirvana for plants that would otherwise be waterlogged.

The latest research of Greg’s team is supported by Grains Research and Development Corporation (GRDC), WA Department of Agriculture and the CRC for Plant-based Management of Dryland Salinity. It is underway on three waterlogged and moderately saline sites at Cunderdin, Woodanilling and North Stirlings. The plots total about 300 ha, with equal areas of crop and pasture.

While farming systems to improve crop production through reduced waterlogging and salinity are his prime objective, Greg believes that productivity could be greatly improved using a system of raised beds if the pasture was harvested as hay or silage, rather than grazed. This would avoid pasture trampling, and the transported fodder would feed more stock for longer. Maintaining good soil conditions in beds for pasture would then be as simple as maintaining them for crop.

“No matter whether raised beds are used for cropping or pasture, they need to be managed with clear objectives of improving soil aeration, internal soil drainage and removing any hardpans to get the best results,” he said.

“Grazing sheep or cattle on beds will damage them and degrade the improved soil. In addition, grazing would involve the complications of providing water and fencing. But taking the pasture to the sheep rather than sheep to the pasture would increase both pasture and animal production and increase profit.”

• Greg Hamilton, Department of Agriculture WA, leads the CRC for Plant-based Management of Dryland Salinity project ‘Soil and water management for profitable crops and pastures on water-logged and saline land’.

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Above: Gary Peacock thigh-high in a raised-bed barley crop.

Opposite page: Barley on raised beds at Bibby Springs.