Local Land Services

NSW GOVERNMENT

Case study | Saving Our Soils During Drought Program

Beef confinement feeding area at “Ellerston” NSW

Property Overview

“Ellerston” is a 30,350 hectare livestock enterprise located in the New South Wales Hunter Valley region (31°49′S 151°19′E). The property runs approximately 9000 beef cattle and 2000 merino and dorper-cross sheep. The average annual rainfall is just over 800mm. Topography ranges from undulating valley floor to low and steep hills, which rise up further to productive plateaus, with an elevation range of approximately 500m to 1300m.

The confinement feeding area was built in 2015 for the primary purpose of improving the beef enterprises’ weaning process. The idea was to wean in the area and move animals through the adjacent yards regularly to accustom/train them to handling by people.

During the drought in 2017-2020 and again in 2023 the use of the area was expanded from a weaner feeding/management area to general drought feeding and early weaning. Additionally, the confinement feeding area is now also used for general livestock management activities, such as quarantining new stock. This is done to check for any potential health issues and reduce the spread of weed seeds when animals are introduced.

Key Messages

Drainage is a primary consideration when selecting a site for the confinement feeding area. Poor drainage can lead to issues including contamination, odour, health conditions and increased feed requirement.

Investing in solid infrastructure such as water and feed troughs, posts and cable can minimise wear-and-tear over time. The area can be used for all classes of stock and for a wide range of purposes.

Some of the property’s pastures are steep and prone to erosion. Implementation of the confinement feeding area has seen an increase in groundcover and reduction in erosion across paddocks, particularly in dry times.

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

SOUTHERN NSW Innovation Hub
SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES

This project received funding from the Australian Government’s Future Drought Fund

Site Selection

Major considerations when selecting a site to build the confinement feeding area included

Figure 2. Aerial image of confinement feeding area and cattle handling facilities

drainage, water supply and proximity to facilities including feed storage and yards.

Topography

The site’s good drainage was the primary reason for its selection. The selected site has a slightly steeper slope than the recommended 4% (less than 5% slope) that contributes to effective run-off (as shown in Figure 2). Appropriate slopes of less than 4% are limited on “Ellerston”, and are generally found on creek flats or well away from other facilities and water making them unsuitable.

To mitigate the possibility of erosion, a gravel base was laid in the pens and lane way. A levy bank across the top of the pens (partly seen in Figure 1 and 3) helps to divert run-off from further up the slope. The slope runs from the back to the front of the pen.

There are no trees or shade structures in the pens, however surrounding hills provide some shelter from prevailing winds in winter. The site has a northerly aspect which maximises evaporation and dries out faster in wet periods. The lack of shade in and around the confinement feeding area is one of the considerations when planning and using the area, particularly as it relates to animal welfare.

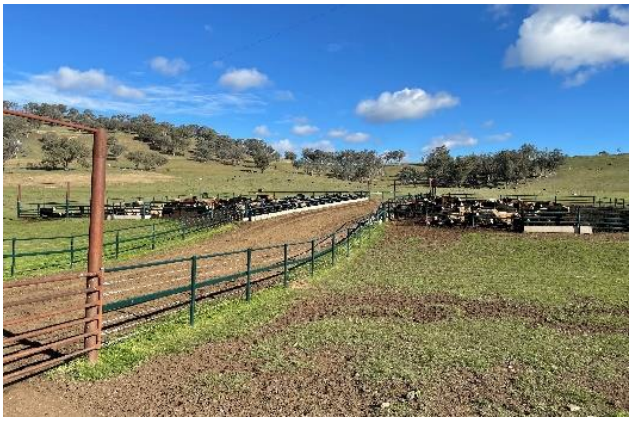


Figure 1. Image showing slope of confinement feeding area

Although there are only short periods in the summer when heat loading can become an issue for cattle in the pens at “Ellerston,” the livestock and weather are continually monitored. Possible heat loading is mitigated by limiting animals’ time in the area in hot summer months and avoiding weaning in periods of extreme temperatures or weather events. Livestock are also able to be let out into holding paddocks with shade.

Access and proximity to existing facilities

Access was a major consideration that contributed to the site selection. The location has good all-weather access for both feed delivery and livestock movement. Gravel roads and lanes are useful for preventing bogging and reducing dust. After particularly wet periods, the area does need to be cleaned out and new gravel laid to reduce bogginess, which is an expense (See Figure 1).

The site is adjacent to the existing cattle yard facilities and connected by a laneway. This allows easy access for management of animals, including treatment of sick animals and handling of weaners.

The water troughs in the confinement area and yards are connected to a tank that holds water

from the nearby river. A back-up bore water supply is also available.

A challenge of the site is the distance to feed storage and machinery sheds. These are located a few kilometres away and contribute to increased time required to feed out.

The site is also located within view of staff residences and a public road which can be impacted by noise, odour and dust, although it does allow for easy monitoring of livestock.

Pen Design & Infrastructure

Pen design is simple, consisting of two large pens, approximately 26m x 50m (1,300m^2), divided by a wide 10m x 90m laneway. This design can be seen below in Figure 3.

Each pen has two sets of double gates (Figure 4) at either end for livestock movements, and large concrete water troughs at the bottom end (Figure 5). This allows access to both sides and water can be cleaned and drained away from the feeding area.

The laneway has multiple double gates at both top and bottom ends that allow for access to paddocks and yards. The top gates are opened to allow space for the tractor and mixer to turn.

Figure 3. Aerial image of pen design

Concrete feed bunks run along the laneway for the length of each pen, which is advantageous as pens don’t need to be entered for feeding out (Figure 6). Length of bunks was a major consideration for design of the feeding area,

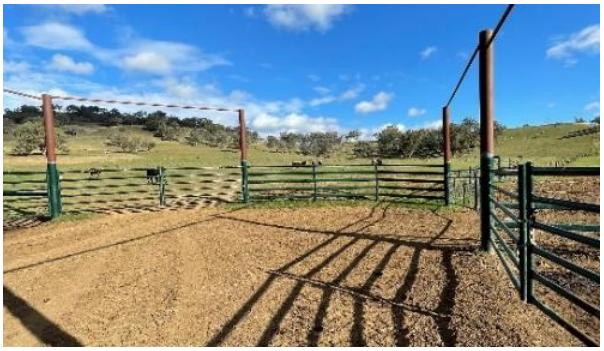


Figure 4. Double gates at top end of laneway; gate on left is opened for turning in paddock

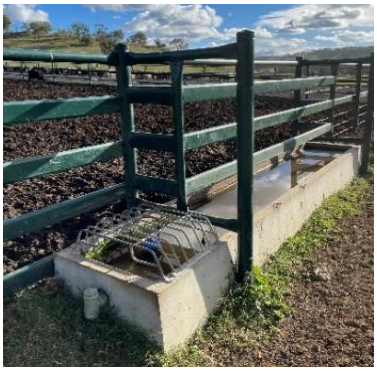


Figure 5. Concrete water trough

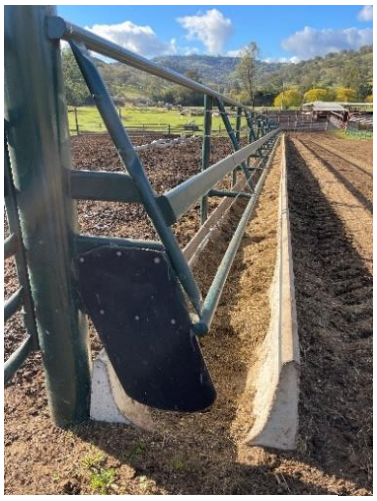


Figure 6. Concrete feed bunks

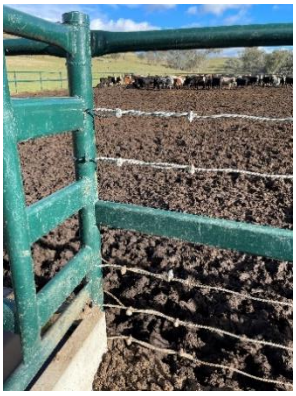
with an aim to give each animal feeding a minimum of 30cm per head.

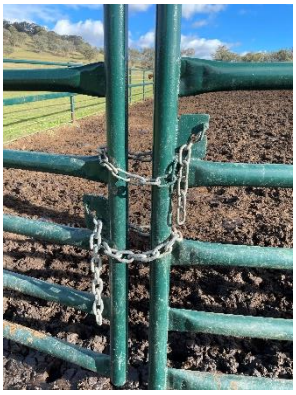
The bunks have been found to be slightly too wide and deep for some classes of stock. They are suitable for animals 250kg and larger, however smaller 150-200kg weaners have difficulty eating, and as a result they stand in bunks, making them dirty and contaminating

the feed. This would be considered if building the system over again.

Steel post and rail, and five cables have been used to construct the two pens and laneway. Gates have double chain and latches (Figures 7 and 8). As seen in Figure 6, the fence has been extended over the feed bunk and rubber flaps added to stop smaller animals escaping.

“I would recommend investing in solid infrastructure - cement bunks and troughs are easy to clean and don’t break. If you build it well in the first place, you have the option to use it for a range of purposes in the future.” - Pastoral Manager





Figures 7 & 8. Rails, cable and gate latches used in construction

Infrastructure and machinery

The design of the confinement feeding area means existing adjacent infrastructure can be used for the management of shy feeders and ‘hospital’ pens. The feed shed is located approximately 4km from the confinement feeding area (Figure 9). A tractor and mixer wagon are used to feed out rations, and a telehandler is used to create mixes.

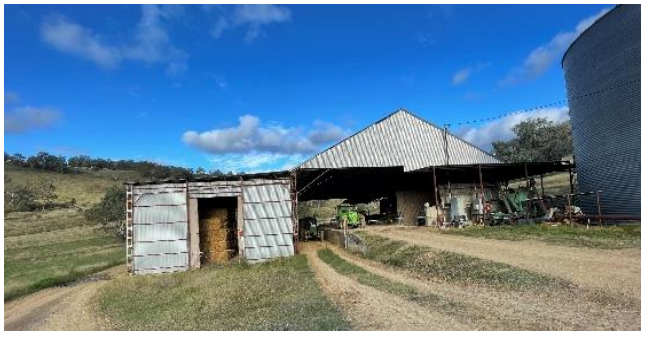


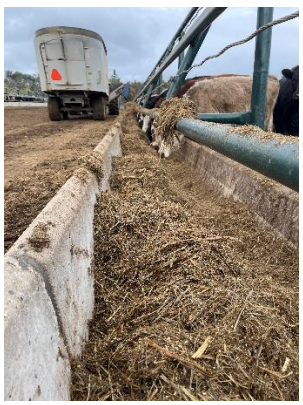
Figure 9. Feed shed infrastructure

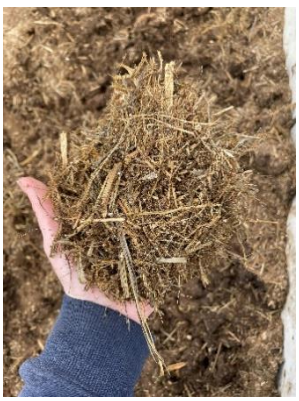
General use of the confinement feeding area

The confinement feeding area is used for drought feeding and early weaning when livestock condition or the season dictates. The area is also used for weaning as part of a routine management calendar.

At the time of writing this case study, the pens were in use for yard weaning 160 heifers and 180 bull calves. They were weaned at approximately 250kg, had been split into each side and will remain in the pens for approximately 10 days. After this period they will be let out into the adjacent holding paddock and further fed for a week. During this week, they will be educated by mustering them into the yards multiple times to run through the race and crush, further familiarising them to handling.

The calves are fed a mixed ration of hay, grain and weaner pellets (shown in Figures 10 and 11). They are started on 0.2kg grain/head/day and 2kg hay/head/day. This is increase by 0.2kg of grain daily, until they reach a ration of 2kg grain/head/day and 5kg hay/head/day.





Figures 10 & 11. Mixed hay, grain and pellet ration

The weaners are monitored closely for signs of acidosis or any other animal health issues. If

these occur, the ration will be adjusted appropriately. The water troughs are cleaned every 1-2 days and feed bunkers are blown or shovelled out if there is dirt or wet feed present.

Benefits of the confinement feeding area

The most obvious advantages of the system include maintenance of groundcover and the reduction of erosion in pastures, some of which are very steep, where animals would have grazed. The gravel base of yards, laneways and access roads also contributes to reduced erosion from management activities.

Aside from these benefits, other advantages of incorporating the confinement feeding area into the general farm operation has been the improved handling ease and temperament of animals held in the area. It has been noted that bunk training improves the saleability of the animals and is attractive to feedlotters and other buyers.

“We are already seeing a premium in saleyards for yard-weaned animals, and I believe there will be a time when this is also the case in feedlots.” – Pastoral Manager

No upgrades or expansions for the area are currently planned for the future. Due to its size and proximity to cattle yards, it is suitable for feeding all classes of stock and is convenient for management activities.

The area could be used for fattening feedlot animals on custom rations. This flexibility has increased management ease and reduced stress in dry times when animals need to be fed easily or calves weaned early.

For more information

Contact your nearest Local Land Services office on 1300 795 299 or visit our website www.lls.nsw.gov.au

Local Land Services

NSW GOVERNMENT

Case study | Saving Our Soils During Drought Program

Sheep confinement feeding area at “Fairview” NSW

Property Overview

“Fairview” is an 830-hectare Merino/cross-bred sheep enterprise located in the New South Wales Riverina region, approximately 8km south of Junee (34°93′S 147°56′E). It is currently running approximately 2100 ewes and lambs in autumn. The property sits at an elevation of around 280m and has an average annual rainfall of 530mm. Topography includes low slopes and alluvial plains, featuring creeks, gullies and granite rock formations.

The current confinement feeding area was partially built in 2019 in response to drought conditions. The aim was to keep the build as simple and cost-effective as possible, and reduce labour required to continually feed. A further three pens were added in 2023 to increase capacity of the area. These will be ready for use when water troughs are installed. Prior to construction, a sacrifice paddock was being used in dry times, however the impacts on groundcover, soil health and perennial pastures were unfavourable. In addition to feeding in dry times, the area is also used for seasonal management of ewes and weaned lambs.

Key Messages

Existing infrastructure such as fence lines can be utilised to ensure the confinement feeding area build is simple and cost-effective.

Proximity to facilities including sheep yards and feed storage is important for reducing labour and time requirements of feeding.

An increase in groundcover and reduction in soil erosion across the property has occurred after moving from using a sacrifice paddock to the confinement feeding area.

Management ease, better grazing control, and increased pasture growth have resulted from implementing the area. This has enabled an intensification of stocking rate.

Site Selection

The primary considerations when selecting a site for the confinement feeding area included proximity to facilities to reduce labour commitments, slope and drainage.

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

SOUTHERN NSW Innovation Hub
SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES

This project received funding from the Australian Government’s Future Drought Fund

Topography

The site has a small slope and is relatively flat. Drainage and wet spots have not been an issue, likely due to the drainage capacity of the red chromosol soil. The flat slope and soil type has also meant minimal erosion has occurred. It took some time and wet periods after the most recent drought for the soil to pack down enough to significantly reduce dust issues. Some eucalyptus and peppercorn trees are present in one pen and the laneway that provide shade and shelter (Figure 2). Some more trees will likely be planted on the top side of the pens in the future to add shade and shelter.

Access and proximity to existing facilities

Proximity to facilities was the major reason for the site selection. It was expressed that centrality to infrastructure is crucial for the operation as a huge increase in efficiency is evident. The owners and managers also have off-farm employment and small children, so minimising time taken to feed or complete other management activities, such as drafting, is essential.

Silage is the main feed used in the pens, therefore access to silage bunkers and hay sheds is needed. Both of these facilities have good all-weather access roads. Figure 1 shows the close proximity of the area to sheep yards, feed and machinery storage sheds and residences. The area is on the eastern side of the houses, helping to reduce dust and odour generated. The buildings also help to reduce the visibility of the pens from the nearby public road.

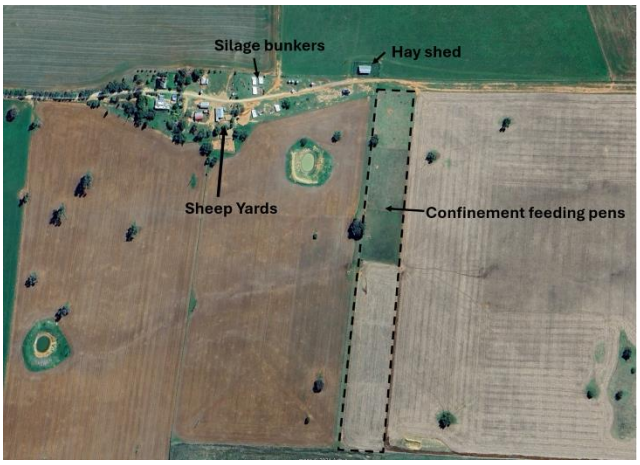


Figure 1. Aerial image of confinement feeding area (area marked by black dotted line) showing proximity to infrastructure.

Pen Design & Infrastructure

The confinement feeding area consists of 6 large pens, approximately 90-100m x 50m in size. A laneway, approximately 28-feet wide, runs along the front of the pens for livestock movements (Figure 2), and larger laneways connect the area to sheepyards, silage pits, silos and other storage sheds.

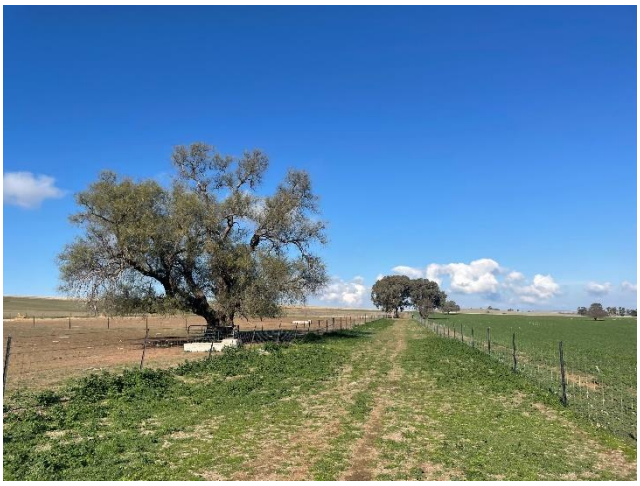


Figure 2. Laneway along front of pens, showing trees supplying some shade

Each pen usually runs up to 400-500 head. This number was based on a stocking density of 10 square metres per head, which is significantly larger than the recommended 5 square metres. It was acknowledged that the pens might be too large, and more head could be run in each, however the large size has been advantageous for manoeuvring the feed cart around easily and for reducing social issues in pens.

Fencing and gate infrastructure

As the aim when building was to keep everything simple and inexpensive, the pens were constructed in a straight line off an existing fence. Basic ringlock wire, steel posts and two top barbed wires were used, and water infrastructure was existing in this area (Figure 3). This reduced wire and fencing labour. Double 14-foot gates have been used on the laneway and first pen, as seen in Figure 4. Single gates have been used for the remaining five pens; however, it was noted that it can be difficult to get stock out of the pens and gates should not be any smaller than 14-foot.

Figure 3. Steel posts, ringlock and barbed wires used

Figure 4. Double 14-foot gates on laneway and Pen 1

Water infrastructure

Concrete water troughs in each pen are gravity-fed from a tank system. A government grant was utilised to put in a more reliable watering system, without which the three-pen expansion would not have been possible. The existing troughs are shown in Figure 5. A limitation of these is their size, as a lot of water needs to be let out when dumping and cleaning. Clean water is essential to the enterprise, and troughs are cleaned every one to two days. These troughs will also be turned around, so they drain towards the outside of the pen which was an oversight on installation.

Figure 5. Current concrete troughs

The troughs for the three new pens are yet to be installed. These are pictured in Figure 6. They are slightly smaller to reduce the amount of water lost when cleaning, and also feature a gap underneath, which has been found to reduce dust settling on the water which can reduce water consumption and lead to health/livestock issues. The selection of these troughs was after discussions with other producers and looking at other confinement feeding areas.

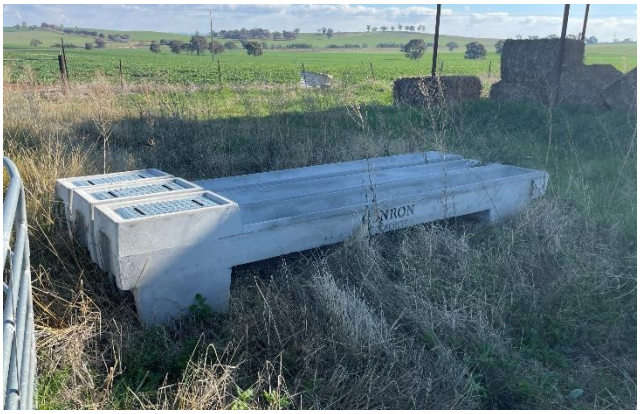


Figure 6. Water troughs to be installed in new pens

General use of the confinement feeding area

The confinement feeding area is generally used for drought feeding and managing seasonal breaks as part of routine

management. Silage is the main form of feed used in the system as it is extremely cost effective. It is essential to take advantage of good seasons to cut silage, often from lucerne and wheat pastures, for storage to be used for feeding in the confinement area. A feed test is obtained when silage pits are opened, and this is used to work out where lupins need to be added to balance protein and energy levels. The feed test is extremely important, particularly when feeding fodder, as results can be extremely variable. Feed test variations have been noted between modules that have been made on the same day.

Usually, ewes are fed by dropping silage bales over the fence into the pens every four days. This seems to reduce social issues including bullying and boredom compared to feeding grain as there is always some feed in the pens. It was noted that the surface area of the bale can be an issue. Some bales spread more easily when dropped, allowing all animals access, whereas some hold together more and may need to be manually spread out. Lupins are trail fed where needed, usually twice per week.

“We have found the most benefit in using the system for managing seasonal breaks. When the autumn break is a few weeks late, like this year, we can lock up all our ewes and save our pastures for lambing” – Angus Knight

In early 2024, the system was used to confine 2000 ewes up until two weeks before lambing in late May. The usual March season break did not occur until April, and thus confining the animals to the pens meant phalaris and grazing wheat pastures could be saved for ewes to lamb onto. This was noted as one of the major management benefits unrelated to droughts.

The area has also been successfully used for holding rams and finishing lambs. It has not yet been used for weaning. In future, the area will likely be used to aid management of worm burdens. Worm egg tests are currently conducted every four weeks in summer for lambs.

The laneway and yards are used regularly when ewes are in the confinement feeding area. Condition scoring is undertaken every four to six weeks to gauge weight maintenance or gain. Feed rations can then be tailored based on this, as no scales are used when feeding out.

The pens are often used as holding yards when management activities are underway in the yards. This has been a great time saver as it has allowed flocks to be brought in beforehand and fed. Flocks can be split ready for contractors and jobs can be easily completed, fit in around other jobs and off farm employment.

Benefits of the confinement feeding area

The major benefits of the confinement feeding area during dry times include maintaining groundcover and reducing erosion. This was particularly evident when moving from a sacrifice paddock system to a confinement feeding system.

A saving of around 15% in feed has been noted when ewes are fed in confinement compared to in a paddock as they are not moving around as much. Apart from these benefits, labour benefits due to time saving from proximity and the use of silage, have been found to be the main advantage of the system.

Management ease and flexibility due to the range of potential uses of the system and time saved has reduced stress. Access to the area, good laneway infrastructure and proximity to

yards allows for quick reactions when under pressure.

Better grazing control, more consistent condition scoring and an increase in pasture growth can be attributed to implementation of the confinement feeding system. Combined with an increased emphasis on genetics and estimated breeding values, the system has made it possible for production to increase from approximately 1000 ewes to the current 2100.

For more information

Contact your nearest Local Land Services office on 1300 795 299 or visit our website www.lls.nsw.gov.au

Local Land Services

Case study | Saving Our Soils During Drought Program

Beef confinement feeding area at “Hazeldean” NSW

Property Overview

Hazeldean pastoral is located near Cooma (36°20′S 149°01′E) in the Snowy Monaro region of New South Wales (Figure 1). The 4,800ha property has an average annual rainfall of approximately 560mm, and an elevation of around 1000 metres above sea level. The topography is representative of the foothills of the Snowy Mountains; featuring undulating hills, open plains and basalt-derived soils.

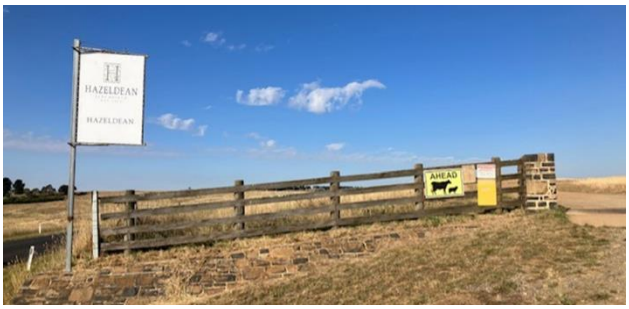


Figure 1. "Hazeldean" Cooma.

The property has been owned and managed by the Litchfield family since 1865. The Litchfield’s are a beef and merino sheep seed stock operation. The studs are Hazeldean Merinos and Hazeldean Angus.

The confinement feeding system was built across 2019 and 2020 in response to dry conditions. Finishing weaner cattle and the protection of the property’s perennial pastures were both considered necessities at the time, so the area was built with these goals in mind.

In addition to feeding in drought situations, the area is also used to assist management of livestock when the quality and quantity of available pasture is insufficient. It has been used for feeding all classes of stock, including weaner calves and young bulls in preparation for sale.

Key Messages

Selecting a site close to existing cattle yards and other infrastructure is important for handling ease and reducing required labour.

Australian Government
Department of Agriculture, Fisheries and Forestry
Future Drought Fund
SOUTHERN NSW Innovation Hub
SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES

This project received funding from the Australian Government’s Future Drought Fund

Pastures need to be closely monitored to manage grazing and avoid overgrazing, ground cover reduction and decline in livestock condition.

The implementation of the confinement feeding area has increased production levels as animals are fed adequately year-round.

Site Selection

The confinement feeding site location was selected due to its close proximity to existing cattle yards and feed storage, enabling livestock to be handled easily and quickly should the need arise. The site also has good all-weather access, an ideal natural slope of approximately 3.5% and light, well-drained soil. The confinement feeding area is located on the south-east side of a small hill to offer some protection from prevailing winds (see figure 4).

The site has no natural shade for the stock, however, this is not an issue in this location, with heat loading events being extremely rare. In addition, the diet that will be fed also lowers this risk.

Pen Design

The confinement feeding area is a 12-pen design, with pens approximately 25m x 35m (875m^2) in size as shown in Figure 2. Laneways were added on the outside of the pens for animal movement. A central laneway, approximately 6m wide is used for feeding the livestock, with a turning circle at the end.

Water is supplied with 5-metre-long water troughs situated between pens (Figure 3). The 5 metre water troughs allow a maximum of 160 cattle per pen (30mm/head and/or space for 10% of stock to access water simultaneously) and in extreme heat conditions approximately 66 head of cattle.

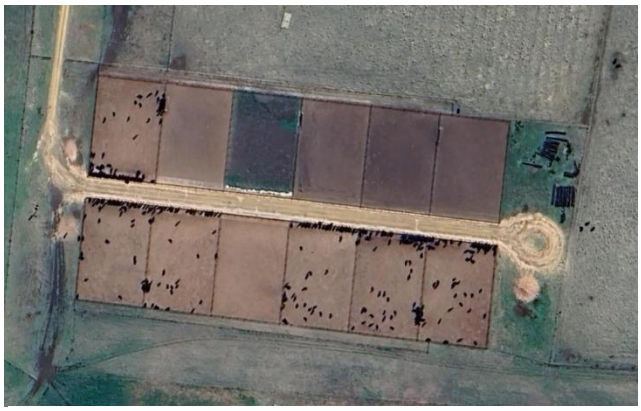


Figure 2. Aerial photo of confinement feeding area.

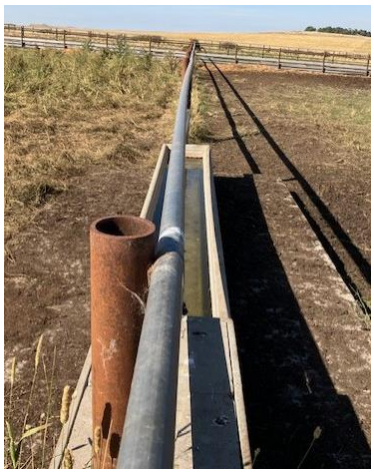


Figure 3. Water troughs located under internal fences.

The troughs are located at the opposite end of the pens to the feeding pad. This was done to maximise the distance between feed and water, thus reducing contamination of the water.

Construction of pens/infrastructure

The confinement feeding pens were designed for the primary use of feeding cattle, but some attempt was made to make the area a dual-purpose facility that could feed sheep as well. Various materials were used in construction. These included

recycled bore casing, cattle rail, metal cable, and W-strap steel.

Originally, the design did not include the concrete feeding pad shown in Figure 4. Previously, the animals were fed in feeding troughs which were inside the pens. The decision was made to replace the feed troughs inside the pens for several reasons. The contamination of feed in the troughs caused by cattle climbing into the trough was a major issue. The difficulty of entering the pens to feed was another concern.

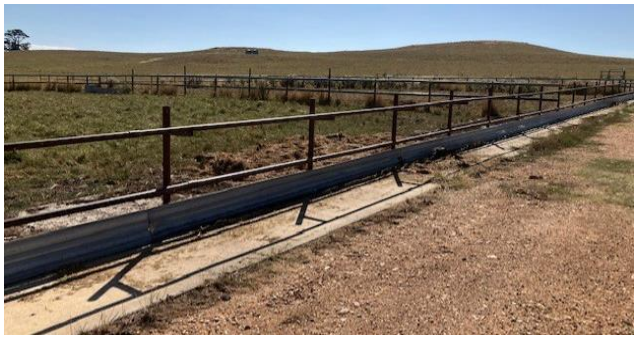


Figure 4. Concrete feed pad.

After feeding from outside the pens and onto the concrete pads had commenced, it was discovered that the metal cable rubbed the animal’s neck/coat. To resolve this, the cable was covered with plastic poly pipe, as seen in Figures 5 & 6.

Figure 5. Poly pipe covering on cable.

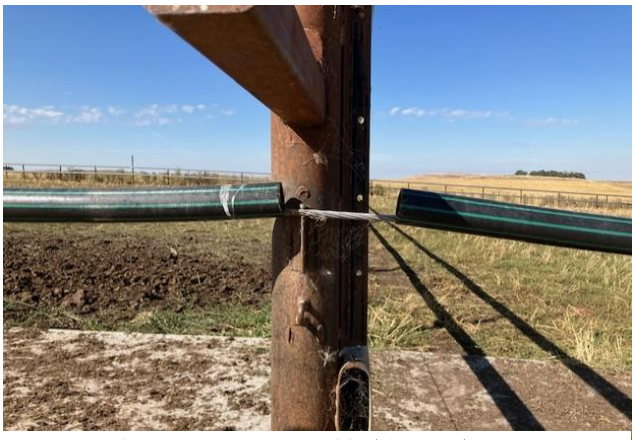


Figure 6. Poly pipe covering on cable (close-up).

The pens were designed for cattle, however, each main post had a star post welded to it. This was so additional wires could be run and the system could be used for the merino enterprise (Figure 7). Since then, the decision was made that a specifically designed confinement feeding area for the merino enterprise was needed. Planning is now underway for this second confinement feeding area.

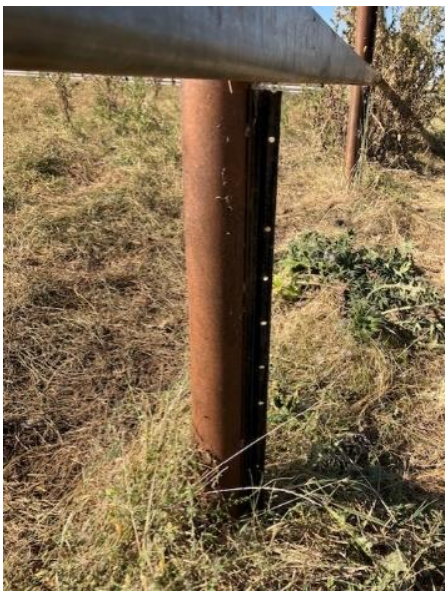


Figure 7. Star post welded so additional wires can be run if needed.

General use of the confinement feeding area

The animals are fed using a mixer wagon each morning. They are fed a total mixed ration (TMR), which combines a roughage, grain, and some additives such as a commercial buffer. Feed buffers have been added to the TMR to reduce the risk of acidosis. This is a result of issues experienced when introducing grain and the use of less-effective buffers not mixed correctly.

The TMR is fed out onto the concrete pad against the W-strap. Inadvertently when the stock eat the TMR, a portion is pushed away and out of their reach. As a result, the TMR is manually raked back across the concrete pad into the livestock’s reach in the afternoon using a four-wheeler and scraper, ultimately providing the animals with two feeds per day.

Benefits of the confinement feeding area

If the season turns and pastures are not providing adequate nutrition and energy, production levels can be maintained easily in the pens. The pens are also used to allow our better country to get away faster in spring, and for weaning young stock. – Bea Litchfield

The confinement feeding area has provided more flexibility in managing the cattle enterprise and has reduced management stress. The area has enabled production and stocking rates to be maintained across the year and in dry times.

By actively managing stocking rates and observing pasture growth, overgrazing has been managed and avoided.

The family noted that they have seen an overall improvement in perennial pastures and soil health. They believe this is a direct result of the incorporation of confinement feeding into their management system.

For more information

Contact your nearest Local Land Services office on 1300 795 299 or visit our website www.lls.nsw.gov.au

Local Land Services

Case study | Saving Our Soils During Drought Program

Sheep confinement feeding area at “Paling Yards” NSW

Property Overview

“Paling Yards” is a 2000ha mixed livestock enterprise (merino/cross-bred sheep and beef cattle), located in the New South Wales Central Tablelands region, approximately 80km north of Goulburn (34°17′S 149°74′E). The property sits at an elevation of around 960m and has an average annual rainfall of 730mm. Topography includes productive undulating hills, low to steep slopes, as well as shallow creeks.

The confinement feeding area was built with a small amount of grant money in 2008 in preparation for dry times. Ten to fifteen thousand animals can be fed in the 10 confinement feeding pens, depending on class of stock. In addition to feeding in dry times, the area is also used as part of the routine management calendar for weaning lambs, worm control and to manage pasture issues.

Key Messages

Consider pen design carefully. The use of wide laneways, effective fencing infrastructure and the positioning of gates has increased efficiency of feeding, stock movements and labour requirements.

Monitoring and assessing stock behaviour is important for identifying and responding to social and health issues.

Confinement feeding areas require continual small improvements to ensure the best outcomes for the system. At “Paling Yards” this has included multiple upgrades to watering systems and fencing infrastructure.

Site Selection

The primary considerations when selecting a site for the confinement feeding area included proximity to facilities such as yards and feed storage, slope, soil type and water.

Topography

The selected site has a slope steeper than the recommended 4%, as can be seen in Figure 1. However, the soil type, mostly consisting of ironstone and basalt is conducive to this and very minimal erosion has occurred during its sixteen years of use. The steeper easterly slope contributes to effective drainage in the pens,

Australian Government Department of Agriculture, Fisheries and Forestry | Future Drought Fund | SOUTHERN NSW Innovation Hub SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES

This project received funding from the Australian Government’s Future Drought Fund

and it runs from the back to the front of the pens.

Pine trees have been planted along the back and sides of most of the pens. This provides some shade and shelter for the animals. The trees also improve the aesthetic of the pens by adding some ‘green’ in dry times, as the area is visible from dwellings and a public road.

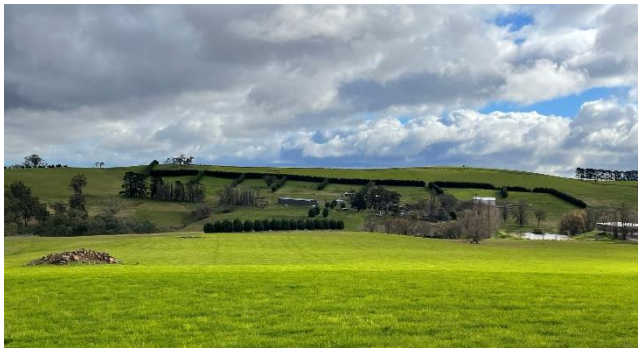


Figure 1. Image of confinement feeding area showing slope of >4%

Access and proximity to existing facilities

The site has good access to existing facilities. All roads are all weather access, which is useful for feeding access and stock movements. The area is directly adjacent to existing sheep yards and connected by a wide laneway that allows for easy stock movements and drafting of pens.

The yards are used regularly to draft the shy feeders and tail from the larger pens. Feed stores are also close by, with silos located less than one kilometre from the area. This is an important time factor, as up to fifteen thousand sheep can be fed in approximately 1.5 hours.

Limitations of the site selection include the proximity to residences and visibility to a public road. The site is on the western side of residences which can cause some dust and odour issues however this has not been an issue in this system due to the local topography and weather, and it allows for easy monitoring of livestock.

Pen Design & Infrastructure

The confinement feeding area consists of multiple pens of approximately 6,000m^2 with tree lines between the pens. Some pens are bigger to allow for use of pre-existing infrastructure. This design can be seen below in Figure 2.

Figure 2. Aerial photograph of confinement feeding area

Each pen was designed to hold up 1200 head and can easily confine 1000 mature sheep at approximately 5 square metres per head. This stocking rate helps to pack down the soil and reduce erosion and dust issues.

Wide laneways approximately of 32-35m are used around the pens which are useful for mustering and stock movements. The wide size ensures good flow, minimal dust issues and trampling compared to narrower laneways, and the ability to pass animals held in the lane with machinery if needed.

Fencing and gate infrastructure

Good, solid fences are essential for the system. The animals can put pressure on the front fences when feed machinery drives past. The pine trees planted along the side fences alleviate the same sideways pressure. Fences

use Clipex posts, ringlock and one barb along the ground (Figure 3). The lack of a top wire is deliberate as it makes moving from pen to pen to clean troughs and check stock easier. Originally 8/80/15 ringlock was used for fences, however the squares were too small, and animals would get their heads stuck. This was replaced with 7/82/30 fencing which has resolved this issue.

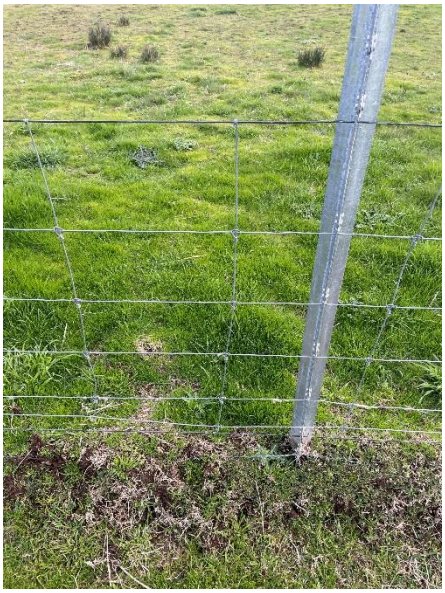


Figure 3. Clipex fence post and 7/82/30 ringlock

Large gate sizes have also been important in the confinement feeding area, particularly for getting sheep out of the pens. All gates are 12 to 14-foot, and double 10-foot gates are used on the top side, as shown in Figure 4.

“Get gates that are bigger than what you think you need and put them at both ends. This will make your life easier when getting stock in and out of your pens.” – Charlie Bell

The incorporation of gates into the pen design and planning of how to move stock in and out has been found to be important with hindsight. Having gates in different corners of pens made it more difficult to get sheep out of pens as they didn’t flow into the laneway well and wanted to go to the opposite corner. Gates should be in the same corner of each pen so animals can flow out towards the sheep yards.

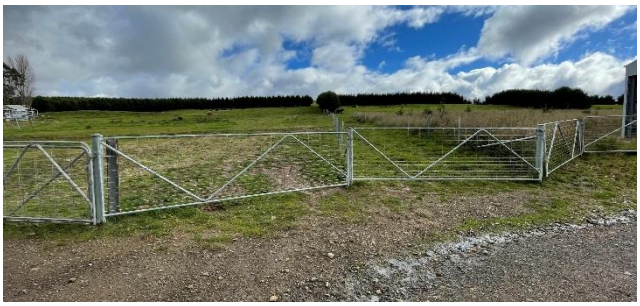


Figure 4. Multiple wide gates at the bottom of pens

Water infrastructure

Each pen contains multiple water troughs at the bottom end, and some also have small pre-existing dams. Troughs are connected to a tank fed from bore water with 1.5-inch poly pipe. This is a secure water supply as there are multiple bores on the property that can be linked if needed, and enough pressure is available to troughs to supply adequate flow.

Troughs are checked and cleaned daily. Multiple watering systems have been trialled in the confinement area with varying degrees of success. Originally PVC troughs were installed as they were the least expensive option. These did not stand up to prolonged use. They were replaced with 4-foot concrete troughs, which were too small to supply adequate water to animals. 16-foot troughs were too large to dump water for cleaning every day and too much water was being wasted.

Two 8-foot concrete feedlot troughs are now being used successfully, shown in Figure 5. These are small enough that the flow rate can fill them quickly, but large enough to supply all animals with adequate water, and more economical than some of the other options trialled. The concrete pad around the trough allows animals to drink at the right height, although ideally this pad would be slightly wider. They are easy to clean by removing the bung and sweeping out once, and as there is at

least once inch of fall on the trough this can be done quickly and without much water wasted (Figure 6).

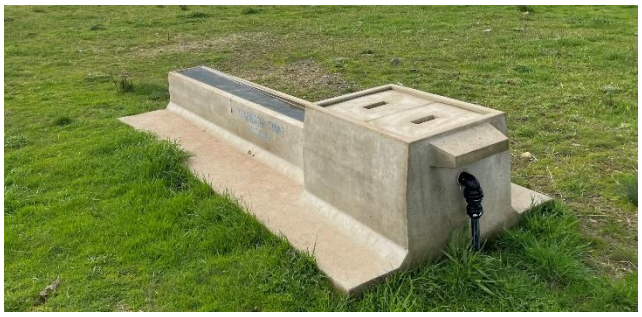


Figure 5. 8-foot troughs currently in use

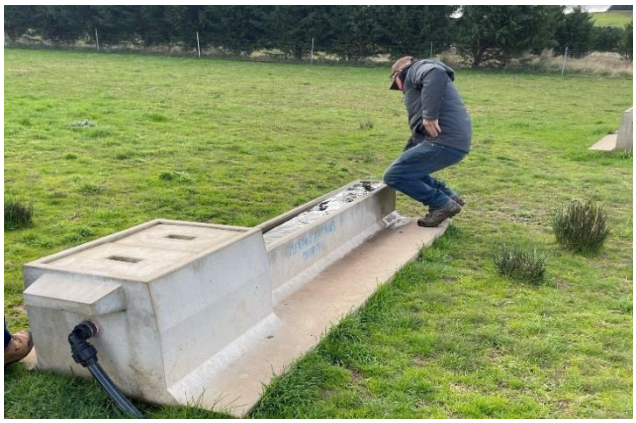


Figure 6. Dropping the bung to clean trough

All troughs can now be cleaned in approximately half an hour. The reduced amount of water dumped has also ensured large wet patches of ground that may contribute to health issues such as salmonella are not present.

Feeding infrastructure

Hay feeders are used to feed straw and lucerne hay. Barley is trail fed along the ground using a feed truck, as shown in Figure 7. It is ensured that the trail is always spread approximately 20m longer than needed to allow the animals to all be there at once, spread out and minimise social issues. When growing animals, the trail is thicker and in a singular line. No health issues resulting from feeding on the ground have been noted, likely due to the soil type being ideal for trail feeding.

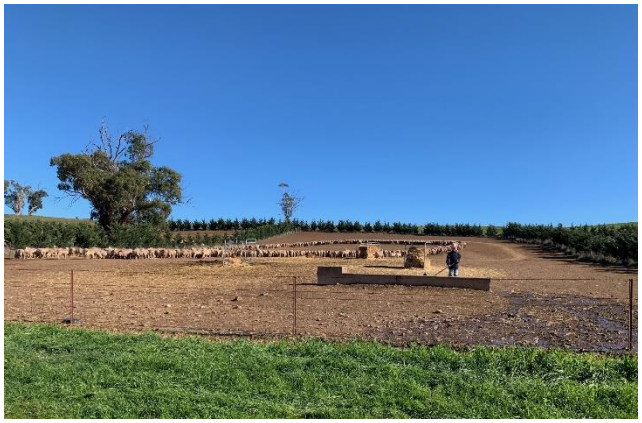


Figure 7. Sheep in confinement feeding area on trail. Photo: Charlie Bell (02/06/2019)

General use of the confinement feeding area

The confinement feeding area is generally used for drought feeding and weaning as part of the regular yearly management calendar. Joining in confinement has not been necessary for the enterprise. Barley and straw are the main feeds used, and sheep nuts and lucerne hay have also been used in the past. Animals are fed barley every three days and ad-lib access to straw is provided. This roughage (shown in Figure 8), provides a buffer and gut-fill, as well as reducing boredom of animals in pens. It has been noted that the animals seem to be happier when provided with the straw as it occupies them by giving them something to chew on.

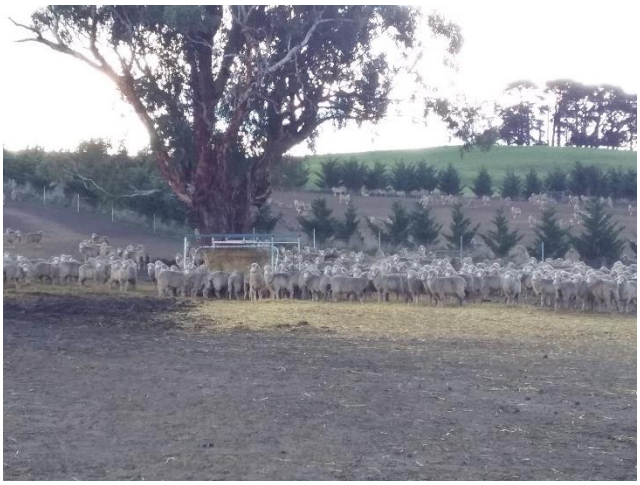


Figure 8. Sheep in confinement with straw in hay feeder. Photo: Brett Littler (13/06/2019)

Lambs are weaned in December at approximately 12 weeks of age. Use of the confinement feeding area ensures their feed requirements are being met and that they are trained onto grain. They are fed in flocks of approximately 500, or no more than 700, which ensures they have adequate space and bullying is reduced. Drafting into top, middle and tail flocks occurs after a week of feeding, and tail enders are put in larger pens with dams.

Emphasis is placed on the introductory period, and an imprinting phase is used where lambs are fed on a very thin trail with their mums prior to weaning. This has been found to make feeding in droughts and in-paddock much easier as the sheep know what the grain is and will eat it straight away. After imprinting, the weaners are started slowly on a low amount of grain and gradually increased up to the required ration over a period of time. The animals are monitored closely for health or social issues. Weaners are kept in the confinement area for around 20 days and given 15 feeds. They are watched closely to ensure they start eating the grain, and around 80% are usually eating after this period. Lucerne hay is sometimes supplied to weaners, with about one hay feeder for 300 lambs. This has been successful but does carry the risk of lamb deaths from smothering.

Close monitoring for social issues occurs for all classes of stock. Consistency is important for the animals, so they are fed at the same time of day and by the same person. Feeding by the same person ensures trail length and thickness is similar each day, and issues don’t arise from inconsistencies. This is particularly important for young sheep.

Benefits of the confinement feeding area

The main benefits of the confinement feeding area for the enterprise have been maintaining groundcover and decreasing the recovery time of pastures. In dry times pastures can be saved and erosion from lack of groundcover controlled. The system has also increased productivity through maintaining stocking rates as more stock can be kept on.

“In the last drought we had much more pasture and could let our animals out onto green feed earlier than our neighbours.” – Charlie Bell

Aside from these major benefits, the infrastructure and proximity to facilities has increased management ease. The laneways and pens are suitable for any class of stock, and can be used for a range of purposes, such as weaning or for holding yards. Sheep are now trained to eat grain and are accustomed to frequent handling. The system has provided flexibility and reduced stress in dry times when animals need to be fed easily.

For more information

Contact your nearest Local Land Services office on 1300 795 299 or visit our website www.lls.nsw.gov.au