

# SPRING FORAGE GUIDE

REAL FARM VALUE & SPRING FORAGE KNOW HOW SINCE 1987



[www.notmanpasture.com.au](http://www.notmanpasture.com.au)  
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**NOTMAN**  
PASTURE SEEDS

# REAL FARM VALUE

SINCE 1987

## ABOUT NOTMAN PASTURE SEEDS

We are a family run business that supports the agricultural industry in Australia to improve productivity and efficiency through enhanced growth in the paddock. Notman Pasture Seeds has grown from a small business operating out of a garden shed on the family farm to a close knit organisation working with hundreds of farmers annually to improve their pasture and crop potential.

A key aspect of the Notman Pasture Seeds culture is the continued focus on research through replicated pasture trials and making that data relevant to the bottom line of farmers. Pasture trials are continually monitored across southern Australia to ensure you receive the best advice.

We are proud to distribute products on behalf of these leading seed, research & development companies - Cropmark Seeds, PGG Wrightson Seeds and Pioneer Seeds.

We work with leading providers of testing, inspection, certification and verification services to the Australasian seed and grain industry. Our quality testers provide a comprehensive range of seed testing services for Notman Pasture Seeds, including Purity, Germination, Identification, Moisture, Weight, Vigour, Tetrazolium, Health and Lolium endophyte.



## RESEARCH & DEVELOPMENT

Many pasture and forage varieties available from Notman Pasture Seeds are thoroughly trialled and tested on farms throughout Australia & New Zealand to assess their performance capability under varying farming conditions.

Notman Pasture Seeds continue to work with our main suppliers to trial and demonstrate new & existing forage products.

Forage varieties are evaluated in these trials for a number of performance-related criteria, including dry matter yield and seasonal performance, pasture quality (including metabolisable

energy, digestibility, protein, NDF, etc), persistence, and susceptibility to plant diseases and insect pests.

Where necessary, the company undertakes animal performance trials to assess the impact of its varieties on livestock performance and health.

A key aspect of the Notman Pasture Seeds culture is the continued focus on research through replicated pasture & cropping trials and making that data relevant to the bottom line of farmers.

## WELCOME TO OUR SPRING FORAGE GUIDE

Welcome to our updated Spring Forage Guide which features a wide range of spring sown forage crop options that can grow valuable feed at key times when pastures are of low quality or quantity. This forage guide includes various cultivars and detailed management guidelines designed to help maximise production in the paddock. Enjoy! Thanks from the team at Notman Pasture Seeds



### CROP PLANTING & GRAZING TABLE (based on Southern Victoria)

	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
PLANT	Vatbuster Megabite Chicory	Chicory Plantain Brassicac Kale	Brassica Maize Millet Sorghum	Brassica Maize Millet Sorghum			Ryegrass & cereals	Ryegrass & cereals	Ryegrass & cereals
GRAZE/ HARVEST		Pasture silage	Pasture silage	Pasture silage/hay Brassica Chicory	Brassica Chicory Plantain Millet Sorghum	Brassica Chicory Plantain Millet Sorghum	Brassica Chicory Plantain Millet Sorghum	Chicory Plantain Fodder Beet Maize Kale	Chicory Fodder Beet Kale



LABERTOUCHE, VIC

# USING SUMMER FORAGES

Spring and summer presents an opportunity to plant a forage crop for summer, autumn & winter feed.

As part of your pasture management program, spring & summer crops can grow valuable feed at key times when pastures are of low quality or quantity.

Dependent on a variety of factors, including environment, planting time, stock needs & water availability, there is a range of varieties available to suit your needs.

Forage brassicas are an extremely valuable, high protein, highly digestible feed source— offering establishment into cooler soils & the ability to mix pasture herbs and clovers into your summer forage blends.

Our Top Crop forage blends are an excellent summer/spring option, producing high quality, high yielding, reliable feed during the summer period when normal pasture quality and production is declining. Companion species work together to provide high quality feed and high dry matter production potential.

Chicory is a highly palatable forage that is an excellent feed source for high livestock growth rates from late spring to late autumn.. It provides high quality feed through summer using summer rain, irrigation or stored soil water.

With it's long and fibrous root system allowing the plant to draw moisture and minerals from deep within the soil, the drought tolerance Plantain provides good year round growth and high quality feed.

In a pasture mixture, Red Clover provides spring, summer and autumn productivity ideal for increased animal performance, enhancing pasture and fixing nitrogen.

Forage Sorghum & Millet with the right conditions—heat, moisture & fertility—can deliver strong early growth & large quantities of highly digestible dry matter that can be grazed or harvested for silage or hay.

Our proven range of Maize hybrids are suitable for both irrigation or dryland, deliver outstanding silage yields with drought tolerance, stalk strength & balanced diets by providing good quality fibre, low protein while maintaining relatively good levels of energy.

## KEY BENEFITS

- Cost effective source of dry matter compared to 'bought in feed' over summer period
- Produce large quantities of feed for a relatively low cost of production
- Be grazed where they are grown, eliminating additional costs associated with hay, silage and grain
- Fast re-growth and good response to summer rainfall compared to traditional ryegrass pastures
- Break the perennial weed cycle using non-selective herbicides leading to more productive pastures
- Break clover pest and disease lifecycles (Nematodes/ viruses) for better clover content in subsequent pastures

## SUCCESSFUL CROPS

- Good agronomic advice is paramount
- High germination seeds (90% +) are a must.
- Control weeds and have an excellent cultivated seed-bed.
- Soil clump size generally smaller than 50 mm.
- Address acidity problems, apply complete NPKS before planting, plus top up fertiliser after germination.
- Monitor for pests and take action if problems occur.
- Introduce stock slowly to enable the rumen to adapt.
- Good seed soil contact a must.

## SPRING PLANTED CROPS - FORAGE QUICK COMPARISON

SPECIES	CULTIVARS	USE	AGRONOMY	READY TO GRAZE	SINGLE/ MULTI GRAZE	GROWTH PEAK	SOWING RATE (KG/ HA)
<b>Top Crop Blends</b>	<b>Various</b>	Reliable summer forage under all conditions	Balance of fibre and protein, drought, respond well to rainfall, excellent re-growth	50-70 days	Multi	Summer - Autumn	8-20
<b>Chicory</b>	<b>Chico Puna Puna II</b>	Very high quality feed in late Summer to late Autumn	Drought tolerance, high ME, insect tolerant & low maintenance	50-70 days	Multi	Late Spring -Late Autumn	6-10 (2-4 mix)
<b>Plantain</b>	<b>Oracle</b>	Year round production in pasture mix	High ME & mineral content, fibrous root system, Drought & heat tolerant once established	50-70 days	Multi	Spring-early Winter	8-10 (1-2 mix)
<b>Red clover</b>	<b>Reaper Amigain USA Red</b>	Companion species to add quality to forage blend	Palatable legume, enhance pasture quality, nitrogen fixing capability	60-100 days	Multi	Spring - early Summer	1-4 (mix)
<b>Tankard Turnip</b>	<b>Marco Barkant MPT Green Globe</b>	Single graze with high yield potential	Low input cost, fast maturing, high yielding, high quality & utilisation	60-75 days (Marco), 70-80 days (Barkant), 90-110 days (MPT)	Single	Summer	1.5-2.5 (0.5 mix)
<b>Leafy Turnip</b>	<b>Pasja II Appin</b>	Fast brassica options - flexible grazing	Fast maturing, high quality, multi graze option, minimal ripening required	42-70 days	Multi	Summer - Autumn	3-6 (1-2 mix)
<b>Forage Rape</b>	<b>Pillar Titan, Goliath</b>	Leafy feed with good response to summer rainfall	Leafy giant type (Pillar), high yielding, multi graze 2-4, strong re-growth potential,	70-110 days	Multi	Summer - Autumn	3-6 (1-2 mix)
<b>Raphano brassica</b>	<b>Pallaton</b>	Bridge autumn-winter feed gap	Multi graze brassica, water efficient, drought tolerance, good insect tolerance	56-100 days	Multi	Summer - Autumn	8
<b>Kale</b>	<b>Regal Coleor</b>	Bulk DM in late Autumn.	Single graze, high yielding crop. Ideally irrigated	150 days	Single	Autumn	6
<b>Fodder beet</b>	<b>Geronimo</b>	High yielding late Autumn feed/ harvest	Intensive crop, high yielding, high ME & utilisation. Irrigation only	150-220 days	Single	Late autumn	100,000 seeds/ha
<b>Millet</b>	<b>Shirohie Japanese</b>	Bulk grass growth, low cost, low animal health problems	Fast growing, no prussic acid, excellent water efficiency, high yielding	45-60 days	Multi	Summer	20-35 (10-15 mix)
<b>Sorghum / Sudan Grass</b>	<b>Betta Graze SSS</b>	Fast establishment, hay/silage option	Fast establishment, water efficiency, suited to grazing, hay and round bale silage	45-60 days	Multi	Summer	15-30 (Betta Graze) 8-15 (SSS)
<b>Maize</b>	<b>Pioneer hybrids</b>	High yielding silage & grain hybrids	Fast growing, high dry matter yields, high digestability, drought tolerant hybrids	Harvest	Silage harvest	Late March	80-100,000 seeds/ha

Below are typical feed values of common green feed and conserved forages used in temperate farming

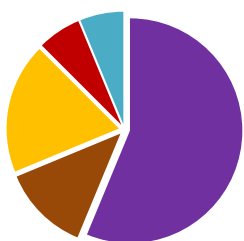


# TOP CROP BLENDS

Our Top Crop blends are unique summer forage varieties that can deliver high quality summer feed with excellent regrowth & reliability in the drier conditions. Top Crop blends have a proven track record for reliable summer production under all conditions, delivering feed for stock when you need it most.

We have carefully designed multi species blends for growers who are looking for an alternative to standard ryegrass and clover pasture blends. Plant diversity provides for a more balanced diet of protein, fibre, energy, and minerals, and these complex mixes seem to have an extra benefit for the soil. The combination of different species anchors soil and provides weed suppression with its diverse canopy, also protecting soil erosion over summer dry periods.

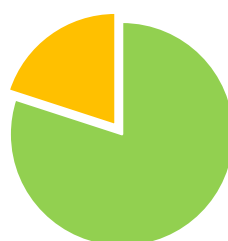
Our Top Crop blends aim to optimise summer feed by producing more tonnes of dry matter per hectare compared to traditional pasture methods. They also provide an ideal break crop over the summer period before planting in Autumn.



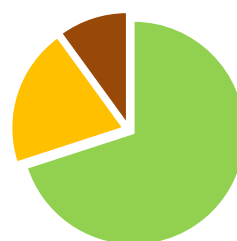
**TOP CROP**  
Brassica & Herbs



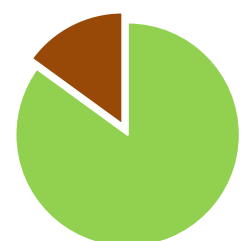
**TOP CROP**  
Brassica, Herb & Millet



**TOP CROP**  
Millet & Rape



**TOP CROP**  
Millet & Brassica






**TOP CROP**  
Millet & Pasja II








## TOP CROP BRASSICA & HERBS

 Multiple Grazings  50-70 days grazing  8 kg/ha

Top Crop Brassica & Herbs is fast establishing, producing high quality feed 6-8 weeks after sowing. It has the potential for multiple grazing's through the summer period when traditional pasture quality & production decreases. It responds well to summer rainfall and with it's superior regrowth potential it's an ideal blend if you are looking for high energy, high DM through to late summer.

## TOP CROP BRASSICA, HERB & MILLET

 Multiple Grazings  50-70 days grazing  6-16 kg/ha

Top Crop Brassica, Herb & Millet blend of Millet, Chico Chicory & Pillar & Titan Forage Rape can produce good summer feed with excellent regrowth under hot conditions given moisture availability. Expect a rotation of around 25 days following each grazings with suitable conditions. Take advantage of the established chicory by oversowing it with ryegrass in Autumn.






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 BEGA, NSW

## TOP CROP MILLET & BRASSICA

 Multiple Grazings  50-70 days grazing  12-20 kg/ha




Top Crop Millet & Brassica delivers the same benefits as Top Crop Millet and Rape with the addition of Pasja II Leafy Turnip. Pasja II has been a strong performing forage brassica in Australia for many years with fast establishment, excellent plant persistence after multiple grazings and strong re-growth potential if moisture available and a good balance of fibre and protein.

## TOP CROP MILLET & PASJA II

 Multiple Grazings  50-70 days grazing  12-20 kg/ha

Top Crop Millet and Pasja is a NEW Top Crop Blend that is a very fast establishing forage crop that gives delivers grazing flexibility. It's high-quality feed has minimal ripening with regards to the Pasja II so can be ready for grazing within 42 days of sowing or delayed for up to 70 days when feed is required.

## TOP CROP MILLET & RAPE

 Multiple Grazings  50-70 days grazing  12-20 kg/ha

Top Crop Millet & Rape offers flexibility with very good yield potentials with Pillar & Titan Forage Rapes in cooler conditions & Forage Millet in hotter, dryer conditions. A fast establishing summer blend with strong regrowth potential (subject to moisture availability) offers multi-graze options for all grazing systems. The blend also provides a good balance of fibre and protein.



# MULTI SPECIE BLENDS

Our 'multi species pasture cropping' blends that produce good quality forage, have a range of different root systems, includes, legume species, flowering plants and species that will add organic matter to the soil surface and in the soil as root mass.

Certain species of multi specie blends are highly competitive with other species, so we have suggested sowing rates to ensure that all species are well-represented in the pasture blends.

We have carefully designed multi species blends for growers who are looking for an alternative to standard ryegrass and clover pasture blends. Plant diversity provides for a more balanced diet of protein, fibre, energy, and minerals, and these complex mixes seem to have an extra benefit for the soil.

## MANAGEMENT

Start on small areas and work out which varieties prosper on your property. Observe the results and then make adjustments as necessary.

It's important that with multi specie blends that contain broadleaf species (such as chicory, plantain) that we do not apply any post emergent herbicides such as 2,4D Amine or MCPA. This will suppress or kill they species in the pasture sward. Multi species do a great job of suppressing weeds anyway!

With all new forage crops it's important to introduce animals slowly to the new forage to avoid any animal health issues. We are continuing to learn more on the interactions of different species in multi specie blends, so we will bring more management information as it comes to light.

## SOIL BUILDING

The combination of different species anchors soil and provides weed suppression with its diverse canopy, also protecting soil erosion. The mixture of diverse root structures also builds soil organic matter and feeds soil microbes, leading to long term soil health and fertility. Deep rooted plants in our multi specie blends can break up soil compaction layers also.

## BENEFICIAL INSECTS

Our multi species blends are often grown to promote populations of beneficial insects and forage for honey bees. We want to encourage naturally occurring populations and encourage population increases with a cropping species that provide feed for beneficials within the

### WHY GROW A MULTI SPECIES CROP?



- **Improve soil and root structure**
- **Improve pasture persistence**
- **Use water and nutrients more efficiently**
- **Interrupt pest and disease life cycles**
- **Prevent soil erosion.**
- **Improve moisture holding capacity**
- **Increase nitrogen with introduction of legume**
- **Prepare soil/paddock for following crop**
- **High quality forage for livestock**
- **Increase production, healthier stock, faster weight gains over traditional ryegrass pastures**

farming system.

Beneficial cultivars include Mantra White Clover, Reaper Red Clover, Chico Chicory, Trikkala Subterranean Clover, Arrowleaf Aerial Seeded Clovers and Crimson Aerial Seeded Clovers

## SUMMER FORAGE MULTI SPECIES

### Summer active with paddock ecosystem in mind

 Diversity  15-25 kg/ha  Paddock ecosystem

Our Summer Forage Multi Species Blend is designed to optimise the paddock ecosystem by ensuring ratios of all the cultivars in this blend are designed to ensure all species are well represented.

The blend is focuses on maximising the function of each species, providing a diverse range of plants for animals to chose from over the warmer months, rather than maximising outright dry matter production.

This blend features a unique mix of forage millet, forage sorghum, Pillar forage rape, Titan forage rape, Pasja II leafy turnip, Chico chicory, Oracle plantain, Mantra white clover, red clover and forage radish. Farmers may customise this mix (add/subtract cultivars) based on their forage requirements.





# FORAGE BRASSICA

Forage brassica crops are an ideal complementary feed, especially when grass quality and quantity declines. Brassicas—highly digestible and low in fibre—play an important summer crop role in pasture renewal by providing high value feed & high yields when you need it most.

## TURNIP (TANKARD OR GLOBE BULB)

Tankard type summer turnips are popular as a milking feed due to the exceptionally high yield potential from a single graze. They also have good leaf to bulb ratio which means high quality feed that offers good utilisation, reduced wastage & ease of harvesting.

## LEAFY TURNIP

These are generally a multi-graze option with a very low ripening period. Leafy turnips offer quick spring, summer and autumn feed with the potential of providing up to 3-4 grazings. They are more prone to stress during summer than forage rapes as they have a less prominent tap root.

## FORAGE RAPE

Forage rapes provide leafy, high quality feed which require a longer maturity time than hybrid leafy turnips. Forage rapes generally grow more dry matter from each grazing than leafy turnips and offer multiple grazing opportunities if moisture is available and the rapes are given the chance to re-grow.

## KALE

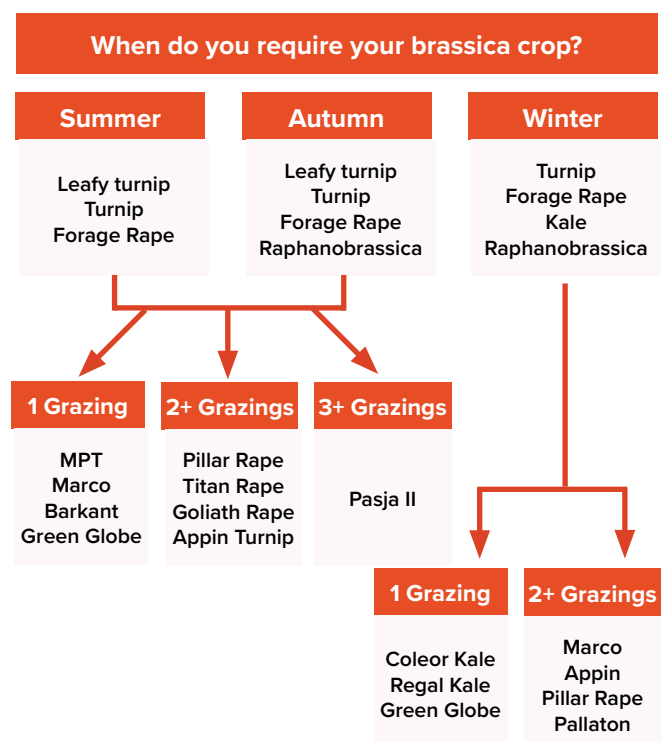
Kale is a species that can produce large quantities of very high quality feed. Tall growing kale provides a cost effective bulk of feed over the late autumn and winter months. Both the leaf and stem is utilised by cattle. It generally has excellent tolerance to aphids and frost which makes it a hardy winter feed option.

## RAPHANOBRASSICA

Raphanobrassica, a hybrid between Brassica oleracea (kale) and Raphanus sativus (radish). It is high yielding offering flexible grazing as early as 56 days after sowing, but can also be deferred up to 100 days after sowing. It is persistent under multiple grazings and has shown high palatability to stock. With efficient user of water and aphid resistance it is perfect for many farming operations.

## KEY BENEFITS

- **Cost effective source of dry matter compared to 'bought in feed'**
- **Produce large quantities of feed for a relatively low cost of production**
- **Be grazed where they are grown, eliminating additional costs associated with hay, silage and grain**
- **Break the perennial weed cycle using non-selective herbicides leading to more productive pastures**
- **Break clover pest and disease lifecycles (Nematodes/ viruses) for better clover content in subsequent pastures**





## FERTILISER

Fertiliser is essential especially if paddock has a low fertility history. Generally sow with 100–200 kg/ha of D.A.P. Nitrogen can be applied in 3 weeks if the crop appears pale in colour, approximately 80-100 kg/ha.

If broadcasting with seed 100 kg/ha of DAP could be used, and spread within 4 hours to avoid seed damage.

## WEED & INSECT CONTROL

Spray old pasture out early with glyphosate and any pasture residue should ideally be grazed off hard or removed by other means before cultivation.

Control broadleaf weeds before sowing, as registered herbicide options are limited in forage brassicas. If the paddock has a history of weeds then a pre emergent herbicide is essential. Trifluralin 480 can be incorporated into soil pre-sowing as a pre-emergent to broadleaf weeds. Incorporation of Trifluralin into moist soil within four hours of spraying is ideal, and a clump size no larger than 50mm.

Control brassica pests such as Lucerne flea, Earth mite and slugs with insecticide when planting as these pests can have serious impacts on seedling establishment.

Diamondback moth can cause serious damage to forage brassicas if untreated. Read more below on Diamondback moth control measures.

Combining forage brassicas with other companion species such as forage millet in our Top Crop blends can reduce the impact of insect damage on the entire crop.

## DIRECT DRILLING

Following chemical pasture control with glyphosate, direct drilling can be used with the following varieties: Pasja II, all Forage Rapes, Chicory & Plantain. If direct drilling, its recommended to increase sowing rate by 50% to ensure adequate plant density.

## SOWING

Mouldboard plough can be used on deeper soils where you won't be bringing up poor subsoil's such as clay, or alternatively disc then power-harrow.

The use of the plough tends to reduce the amount of weeds germinating due to the soil inversion (weed seeds are buried to a depth of 75-100mm) deep.

Sow into a cultivated seedbed. Broadcast from a power harrow, then harrow with light mesh, and roll. If direct drilling, surface needs to be even and sow no deeper than 1cm using 2 kg/ha. In dry soils, reduce rate.

## GRAZING MANAGEMENT

This is important for many of the older type forage rapes where the leaves needed to turn a bronze purple colour which indicated that the crop was ready to introduce stock.

Don't allow stock sudden unrestricted access to a brassica crop. Sudden access can upset the balance of rumen microbes, resulting in poor animal performance, scouring and ruminal acidosis.

Start by grazing the crop for no more than 1-2 hours per day, building up to a maximum allowance over at least 7-10 days.

Break feed brassicas to ensure that the high quality leaf is balanced with stalks or bulbs. Break feeding or strip grazing will improve utilisation as well as allow maximum re-growth potential of the forage rape crop or leafy turnip.

They can also be grazed in conjunction with summer dry pasture to help balance the diet.

## ANIMAL HEALTH

Good animal health management and monitoring limits problems associated with grazing forage brassicas.

Monitor nitrate levels in overcast conditions and following periods of drought & frost to identify possible nitrate issues.

Grazing brassicas as a high proportion of the diet can put young animals at risk of pulpy kidney. Vaccination before animals go onto the crop can reduce the risk of illness

High levels of SMCO (S-Methyl Cysteine Sulphoxide) can occasionally cause red water in ruminants, particularly in cattle grazing kale.

Restrict excess nitrogen and sulphur fertiliser applications (especially on soils already high in sulphur) and avoid feeding flowering brassica's.



## MULTI GRAZE LEAFY TURNIPS

Leafy turnips offer greater flexibility than other brassica species. Grazing of leafy turnips can be as early as six weeks after sowing.

### PASJA II LEAFY TURNIP

One of the fastest brassica options around

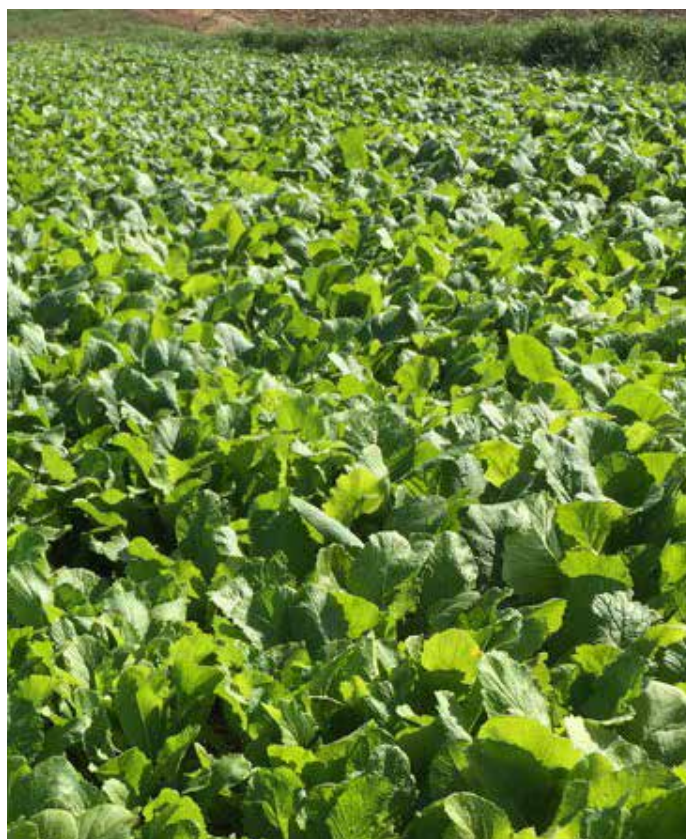


Pasja II – the brassica to choose when fast, high quality spring/summer/autumn feed is needed for all stock classes. Pasja II combines early maturity with yield and the option for multiple grazings if moisture available, providing quality fast feed you can rely on.

Pasja II is an early maturing hybrid leafy turnip that can be grazed 6-8 weeks after sowing. Standalone Pasja II leafy turnip crops are best utilised when strip grazed and fed with dry summer pasture. It provides high quality feed through summer when ryegrass pasture protein and ME is in decline.

Alternatively Pasja II leafy turnip is available in our Top Crop Brassica & Millet blend with forage rape and forage millet as a spring sown crop to provide a balanced diet of fibre and protein over the warmer months.

A significant trait improvement which Pasja II has over the original Pasja is its reduced bolting. Bolting is the presence of yellow flowers and the plant going from vegetative growth to reproductive growth. It reduces feed quality, feed intake and overall yield which all lead to reduced animal performance and productivity. The bolting of Pasja II is much less than with the original Pasja which makes Pasja II a much more flexible variety.



### APPIN LEAFY TURNIP

Flexible, multi-graze leafy turnip with high winter growth rate



Barkant bulb turnip - the highest yielding summer bulb turnip in the business. Barkant turnips produce high quality feed with a high metabolisable energy (ME) value, meaning greater animal performance can be achieved. It is a high performance feed for lactating dairy cows, supplying the energy required to boost milk production. Barkant offers proven performance year after year. Tankard bulb shape to enhance utilisation and reduce risk of choke associated with round bulbs.

## DIAMONDBACK MOTH CONTROL

A key pest in brassicas, the Diamondback Moth can cause severe damage (can occur in only a few days) if your crops are not monitored regularly. In extreme cases, damaged crops have been ploughed in and planted to forage millet or left to Autumn pasture re-sowing. Management starts with early detection to prevent the leaf-mining larva, that can be detected by the silver markings they cause on the leaf surface.

Insecticide does not control adults or eggs, so it is essential to spray larvae before they have developed from an egg to adult—which can be as short as 14 days in warmer temperatures (see below).

Ensure good spray application and use equipment (e.g. droppers) which gives good coverage of the plant, particularly on the undersides of the leaves. Before any spraying is undertaken, check grazing withholding periods.

### HOW LONG IS A DBM LIFECYCLE?

Constant Temperature	12°C	15°C	25°C	28°C
Generation Time (egg to egg)	112 days	47 days	17 days	14 days

### LIFE CYCLE

Eggs	Size 0.5mm	
Larvae	12 mm	
Pupa	12 mm	
Moth	10-12 mm	

## SINGLE GRAZE TURNIPS

Tankard type summer turnips are popular as a milking feed due to their exceptionally high yield potential from a single graze.



### MARCO TETRAPLOID TURNIP

The fastest establishing turnip



The earliest maturing summer turnip available in Australia, Marco is a tetraploid, tankard type, having an interval from sowing to grazing of just 55-65 days.

Because of the quick maturity of Marco, it is an ideal crop where limited moisture is available or an unseasonal rainfall event provides an opportunity to plant a fast maturing crop.

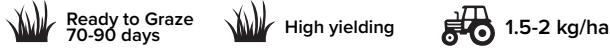
Marco has a high root to leaf ratio, with large bulb size and good bulb storage ability. It is highly palatable, high ME content, has excellent bolting resistance and high club root resistance, and very good utilisation levels by livestock.

Its very short interval to grazing means less time out of pasture and sowing date flexibility. A summer Marco turnip crop makes an ideal preparation for the following autumn's pasture renovation program with good chemical weed control options available.



### BARKANT TURNIP

The perfect balance for summer pastures



Barkant bulb turnip - the highest yielding summer bulb turnip in the business. Barkant turnips produce high quality feed with a high metabolisable energy (ME) value, meaning greater animal performance can be achieved. It is early maturing making it a better option than grain for summer to autumn milk production. Ready to graze in 10-12 weeks. Feed quality peaks around 12 weeks, but can

### MAMMOTH PURPLE TOP

Cost effective late maturing turnip



Mammoth Purple Top is a cost effective mid maturing tankard type turnip that has been widely used for many years. Mammoth Purple Top is an older variety which is a hard flesh turnip, high yielding and suited to dairy, beef and sheep cattle. Both the leaf and bulb can be utilised by grazing animals.

VARIETY	MATURITY
Marco Turnip	55-65 days
Barkant Turnip	60-90
Green Globe Turnip	90-120
Mammoth Purple Top	100-120

### GREEN GLOBE TURNIP

Winter hardy bulb turnip



Green Globe turnips are ideal for late autumn/winter feed in more challenging environments. Planted in summer they can be grazed 90-120 days after sowing; they do not require a specific ripening period. There are a number of situations where they can be incorporated whether it is as part of a development plan (i.e. breaking in country), lower fertility soils or more challenging topography.

## FORAGE RADISH

Forage Radish (*Raphanus sativus* var. *longipinnatus*) are members of the brassica family which are excellent at breaking up & penetrating compacted soils more deeply than most other cover crops. Forage Radish is available in our Multi Specie Pasture Blends that focus on regenerating pasture soils and providing quality forage value alongside other brassicas, herbs and grasses for livestock.

Forage Radish grows long taproots that can grow several 100mm deep, boring holes into the ground, loosening the soil. Ideally autumn & spring sown, the Forage Radish taproot 1) grows vigorously, 2) mines for soil nutrients 3) stores them in the bulb 4) at the end of the growing season the roots decompose and open up the soil 5) provide access for subsequent roots to reach subsoil moisture

- Available in our Multi Specie Pasture Blends, or as a standalone crop.
- Alleviation of soil compaction
- Weed suppression
- Good plant resilience in drier conditions
- Nutrient capture and release
- Erosion control
- Improve water infiltration
- Green manure crop

## FORAGE RAPE

A quick growing, leafy brassica plant, this species provides a very palatable, high yielding, protein rich crop for livestock.



### PILLAR FORAGE RAPE

#### High yielding multi graze forage rape



Pillar Forage Rape is an fast establishing, high yielding multi-graze giant-type forage rape with strong re-growth potential, good aphid tolerance and disease resistance.

The dry matter yield potential of Pillar is proving on farm to be a real highlight, as is its flexibility for spring or autumn sowings.

Pillar can be used as a flexible 3-4 graze forage crop in the right conditions, sown in either spring or autumn to provide fast establishing summer or autumn/winter feed. It's strong summer production and re-growth means more livestock per hectare over periods when traditional ryegrass pastures are low in quality and

quality.

Pillar Forage Brassica can be used over many different Australian farming areas with crops have successfully been used from cereal cropping zones to high rainfall regions.

In lower rainfall regions with lower yields, Pillar Forage Rape will still produce a high-quality crop that is a cost-effective alternative to poor quality summer pastures.

Pillar is suitable for all livestock types and farming systems and is an ideal break crop as part of a re-grassing programme.

### TITAN FORAGE RAPE

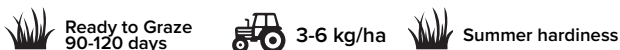
#### The tasty forage rape



Titan combines early maturity, high dry matter yields and exceptional palatability to deliver a high quality summer/autumn/winter feed option. Titan provides very good aphid and virus tolerance. Titan is an early maturing that can be grazed from 70 to 90 days after sowing. Grazing livestock can be introduced to the Titan crop area first at 70 days after sowing and can be ready for re-grazing after 30 to 40 days with favourable conditions. New leaves appear from each node on the stem and if the central stem is maintained after grazing, excellent re-growth can occur on Titan forage rape crops. Even though it is optimal to maintain the central stem to maximise re-growth, Titan forage rape has been developed to re-grow from hard grazing to ground level.

### GOLIATH FORAGE RAPE

#### Versatile all rounder



Goliath is a 'giant' type rape and the maturity, as a general rule, is later than that of the intermediate types (Titan) which can be a challenge in some years when rainfall is limited in a dryland situation. Goliath is a rape/kale interspecies cross. However, unlike older varieties of forage rapes where the leaves/ leaf margins are required to turn the characterised purple/bronze, Goliath's leaves stay a green colour. Goliath rape should still be grazed at the required grazing period of 90-120 days after sowing to maximise animal performance and limit the possibility of animal health issues whilst grazing the crop.

## GRAZING FORAGE RAPE

- Introduce livestock to crop (1-2 hours a day), building up to a maximum allowance over at least a 7-10 day period to allow rumen microbes to adjust to the high quality forage.
- Feed dry stock and dairy cows no more than 70-80% and 33% of the diet as brassicas
- Prevent gorging & help rumen microbes adjust by feeding extra fibre prior to and while grazing forage rape crops
- Do not feed frozen brassica to stock, feed silage/hay in the morning then shift the break in the late-morning/early after-noon.






## KALE

Kale is a tall growing brassica species that can produce large quantities of very high quality feed over late autumn and winter.



### COLEOR KALE

**Fine stem, leafy Kale for ultimate utilisation**

 Ready to Graze 150-220 days  4-5 kg/ha  High leaf to stem ratio

Coleor Kale is a high yielding, leafy, diploid Kale of short to medium height, very high leaf to stem ratio (60%) and very good winter hardiness. Of particular note is Coleor's high dry matter digestibility and metabolisable energy content which means potentially higher livestock performance. Being a medium stem kale, Coleor is suited to both cattle and sheep as a high yielding winter feed crop. Highly recommended in cooler regions due to its very good winter hardiness. Sown in late Spring whilst moisture available.

### REGAL KALE

**Versatile all rounder**

 Ready to Graze 150-220 days  4-6 kg/ha  Winter yields




Regal is an intermediate height kale which provides exceptional forage yields for your stock to graze over the cooler winter months. Selected for soft stems and high leaf to stem ratio, regal crops provide plenty of leafy forage leading to excellent utilisation as well as maximising animal performance. Regal Kale has very good winter hardiness and excellent pest and disease tolerance

## RAPHANOBRASSICA

Hybrid kale and radish interspecies cross which is high yielding offering flexible grazing as early as 56 days after sowing.

### PALLATON RAPHNO

**Excellent re-growth for persistent grazing**

 Ready to Graze 56-100 days  8 kg/ha  Multi graze specialist

Pallaton combines five important traits to suit Australian farmers within increasingly challenging environments.

Pallaton provides feed when farmers need it most, bridging the autumn/summer feed gap for beef, sheep and dairy as a result of its impressive water use efficiency. Pallaton has proven itself as highly palatable, with stock preferring to graze Pallaton compared to forage rape in trials.

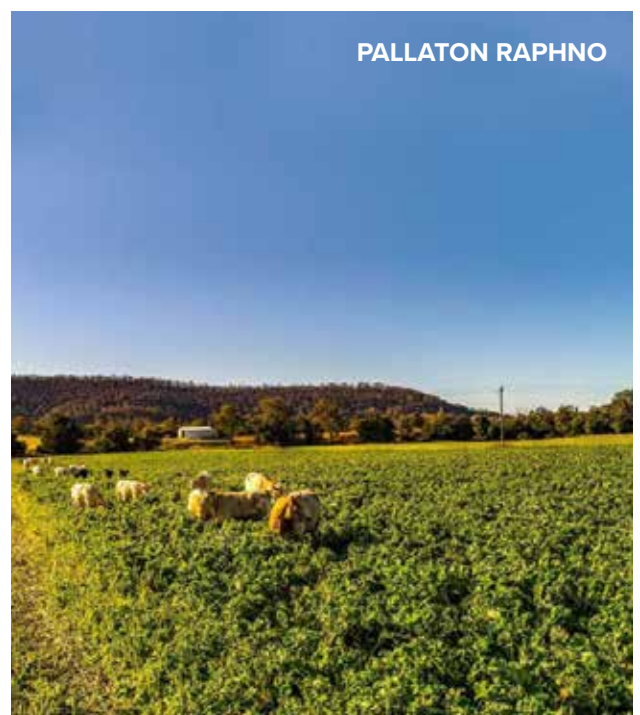
High yielding: Pallaton has a 14% increased yield advantage relative to Goliath® forage rape in a multi-graze system (total cumulative yield from repeat harvests).

Flexibility: Graze Pallaton as early as 56 days after sowing (DAS), to maximise crop utilisation and regrowth potential. It can be deferred up to 100 DAS, however utilisation and regrowth potential will be reduced. Pallaton does not have a specific maturity requirement.

Water use efficiency: 38% increase in water use efficiency (WUE) relative to Goliath® forage rape.

Persistence under multiple grazings: Pallaton has excellent regrowth potential and has the ability to persist for 4-5 grazings over a 12 month period.

Pallaton Raphno® is sold by the hectare, and is sown at a rate of 8 kg/ha.





# FODDER BEET

Fodder Beet, a cross between mangels and sugar beet, is potentially the highest yielding winter forage options available to farmers currently. However under Australian conditions Fodder Beet should be ideally under irrigation over summer. Fodder Beet is ideally used as a late summer/autumn feed option to bridge a feed gap.




It is an attractive option with its palatability, digestibility and very good disease tolerance. It aims to combine the ease of harvest of mangels with the high dry matter yields and high sugar levels of sugar beet. Fodder Beet is a long growing season crop that requires attention to detail from sowing through to grazing/harvest, but if done well, using good products and good advice the cost of production can be very low.

Pre-emergent herbicide, applied immediately after sowing is highly recommended. Crops must be monitored frequently through the establishment phase as timely weed control is essential for good yield results.

Developed fodder beet plants are relatively tolerant of most brassica pests, although aphids need to be monitored and controlled as they damage the plant and also carry and spread disease. Continue to monitor crops for fungal disease and apply fungicide if deemed appropriate

## GERONIMO FODDER BEET

**Versatile all rounder**

 Ready to Graze 158-220 days  100,000 seeds/ha  Winter yields

It has a yellow – orange tankard shaped bulb that sits approximately 45% above the ground. It is a high yielding variety with medium dry matter content at 15-17% DM, with very good tolerance to the diseases Rhizomania, Ramularia and Mildew.

Geronimo Fodder Beet is consistently high yielding with large top growth that can be grazed in-situ, or be lifted and fed whole or chopped. Seed is available in 50,000 seed units

## KEY BENEFITS

- **High yield potential (20 t DM/ha+) per hectare**
- **High ME value (12-13 MJ ME/kg DM) and utilisation (typically 90%), for improved animal performance.**
- **Relatively low cost c/kg DM at high yields.**
- **Unaffected by most brassica diseases.**
- **Versatility.**

## GRAZING FODDER BEET

Before grazing it is important to get your crop yield measured so you have an idea of how much feed is available to help work out your break sizes. Acidosis can occur if animals are not restricted in the amount of fodder beet they consume over the first few days.

It is very important that animals are transitioned very carefully on to fodder beet over the first 14 days, slowly increasing their ration. Ensure adequate water and supplement is available. Fodder beet should be fed to stock at no more than approx. 70% of their ration.





# CHICORY

Chicory is a deep-rooted broad-leaved perennial herb, which has proven to be an excellent source of high quality & yielding feed from late spring to late autumn.

Chicory produces leafy top growth and has a thick, deep taproot—which can go down up to 1.5metres—giving it excellent drought tolerance and mineral extraction. Chicory has good disease resistance, insect tolerance, along with tolerance to acidity and has been successfully grown in soils with low pH soils.

Understanding whether a perennial type or a bi-annual type is needed must be the initial decision which should make the variety selection a little simpler.

## Paddock Preparation

Control broadleaf weeds before sowing, as registered post-emergence herbicide options are limited. Paddock preparation should aim to start a year ahead of sowing if selecting perennial chicory.

Cultivate deep soils with a mouldboard plough to a depth of 10cm with no grass showing. We recommend using a disc to level and break down clumps using two passes.

After this first pass and before the final pass spread fertiliser and apply pre emergent chemical (see fertiliser).

## Sowing

Chicory seed is sensitive to the cold therefore spring sowing is recommended, however early autumn sowing is possible, as long as the chicory has established before going dormant in winter.

Chicory prefers soils that are free draining, avoiding very wet soil types that can be water logged for extended periods of time. For irrigation, water the soils before planting and plant seed when soils have dried out reasonably well.

For single stands of chicory, plant seed at a rate of 8-10 kg/ha at a depth of 1cm, extended to 2cm for sandy & dry soils.

## Chicory Blends

In summer forage pasture mixes such as Top Crop Brassica & Herbs or Top Crop Brassica, Herbs & Millet chicory combines well to be added to a pasture mix at 0.5-2.0kg/ha.

Chicory combines well with other forage varieties including plantain,

## Key Benefits

- **Highly palatable forage**
- **Excellent feed source for high livestock growth rates**
- **Provides high quality feed through summer using summer rain, irrigation or stored soil water**
- **Able to produce high quality forage on acid soils**
- **Recovers quickly after grazing**
- **Can be used for silage production as part of a pasture mix.**

clover and forage rape, or with temperate grasses and clover.

## Fertiliser

Chicory soil pH range is very broad, however for optimum production it requires moderate to high soil fertility (similar to ryegrass & clover pasture). Provided moisture is available through growing season.

General pre-plant fertiliser programme includes Urea at 50kg/ha, MOP at 50kg/ha and Superphosphate at 100kg/ha - unless soil P and N levels are high.

## Insect & Weed Control

Prior to sowing, using pre-emergent herbicide such as Trifluralin is important to suppress and/or control undesirable weeds and grass including annual ryegrass, barnyard grass, pigweed, amaranthus, winter grass and wireweed.

Pre-emergent herbicide application is also important as there are limited post emergent chemical registrations available for weeds in chicory.

Our recommendations is sowing chicory where broadleaf weeds are a known problem until such time that they have been reduced significantly to allow chicory to establish without too much competition.

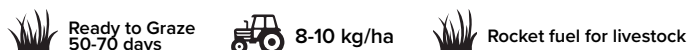
Red Legged Earthmite and Lucerne Flea are the most damaging pest to chicory, especially chicory seedlings. After sowing, the pasture should be inspected twice a week for earth mites until the pasture is established. If mites are observed these can be managed in a chicory pasture by using an insecticide





## CHICO CHICORY

### Rocket fuel for livestock performance



Chico Chicory is high yielding, very high quality and leafy chicory showing fast establishment, rapid re-growth, strong insect resistance and good drought tolerance.

Chico Chicory is noted for its leafy upright growth and for its strong summer, autumn growth providing high quality summer forage. Chico is ideal as a specialist summer crop for boosting production in high livestock performance systems. Chico is a specialist in finishing stock and maximizing milk production.

Chico is ideally planted in mid spring and delivers high quality feed from its first grazing through to mid April.

- **Very high quality, high yielding summer forage crop**
- **High in metabolisable energy and minerals**
- **Very high livestock performance potential**
- **Improved summer-dry tolerance**
- **Fast establishing and rapid re-growth**
- **Leafy, succulent and palatable (stock take to it readily)**
- **Won't cause grass staggers or facial eczema**
- **Tolerant of Diamondback Moth and White Butterfly**

### GRAZING CHICORY

The deep chicory tap root system can follow moisture through the soil profile during the establishment period resulting in chicory being anchored well and able to withstand the initial grazing pressure. Implement the pulling test to make sure that the chicory plants are established well enough to withstand grazing.

Chicory should be first grazed no earlier than the seven-leaf stage which is approximately 8 weeks after sowing in spring. Graze when the chicory has reached 35cm, applying 80 kg/ha Urea after each grazing if moisture is present. Aim to feed 3-4kg DM/cow

Dependent on climate, graze chicory at 35cm again – at approximately 20-35 days after first grazing. Where chicory is in a pasture mix the paddock should be managed as it would be as a normal grass/clover pasture, grazing to residuals of 1500-1600kg DM/ha.

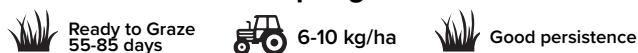
As with most multi graze summer crops back-fencing is needed avoid grazing regrowth. Hard grazing, particularly after damage to the crown in wet conditions, may affect production and persistence. Ensure the crop is not grazed below 5cm or after flowering.

Feed type (leaf)	Digestability (%)	Energy (ME)	Crude protein (%)	Total N (%)
Chicory	70-80	9-11	14-24	2.2-4.3
Sub clover	53-80	8-10.5	13-21	2.08-3.42
Perennial ryegrass	50-77	7-9	9-27	1.4-5.26
White clover	54-82	8.8-12.3	17-24	1.65-4.7
Lucerne	48-77	7-11	13-24	1.6-4.6

Table: Feed quality analysis (NSW Department of Primary Industries)

## PUNA II CHICORY

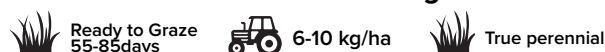
### Nutritious feed from spring to late autumn



Puna II is a broad-leaved perennial forage crop for medium-long term grazing (2-5 year persistency). It was selected through a long term breeding programme in New Zealand for its nutritive value, productivity, palatability and persistency. A true perennial, Grasslands Puna II delivers highly nutritional premium quality feed and high dry matter production from spring to late autumn.

## PUNA CHICORY

### Perennial herb for summer forage



Puna has very little winter growth but is most useful as a perennial summer forage with high production from December through to May on well drained medium to high fertility soils. Puna is ideally suited to intensive sheep and beef grazing systems due to its prostrate growth. Puna is a reliable performer offering high quality feed making it an ideal companion to pasture in a finishing system.

#### CHEMICAL CONTROL OPTIONS\*

Option	Product	Active	Targeted weeds
Incorporated pre-emergent into soil	Trifluralin 480EC	480g/L Trifluralin	Annual ryegrass, Barnyard grass, Canary grass, Caltrop, Crab grass, Pigweed, Amaranthus, Redshank (Prince of Wales feather), Summer grass, Winter grass, Wireweed
Post Emergent 4th leaf stage	Flumetsulam 800WG	800g/kg Flumetsulam	Chickweed, Spurrey, Wild Radish, Hedge Mustard, Amaranthus, Cleavers, Black nightshade, Fathen, Shepherds Purse, Mallow, Annual Buttercup
Post emergent grass control (3-4+ leaf stage)	Haloxyfop 520EC	520g/L Haloxyfop	Annual grass weeds including annual ryegrass, summer grass, banyard grass, bristle grass & volunteer cereals **OFF LABEL
Contact insecticide	AlphaCyper 100EC	100g/L Alpha-Cypermethrin	Red legged earthmite, common armyworm

#### CHICORY or PLANTAIN?

	CHICORY	PLANTAIN
<b>Use</b>	Standalone or in a pasture blend	
<b>Root system</b>	Deep tap root	Fibrous, course root system
<b>Drought tolerance</b>	Good	Good. Wilt if moisture stressed. responds well to moisture
<b>Soil type</b>	Range of soils. Avoid waterlogged & heavy clay	Better suited to heavy soils than chicory. Still avoid
<b>Growth peak</b>	September to May	All year round
<b>Productive years</b>	1-2 years under dairy grazing	2-3 years under dairy grazing
<b>ME</b>	11.5-13 MJ/kg DM	11-12 MJ/kg DM
<b>Crude protein</b>	16-27% DM	16-28% DM
<b>Grazing height</b>	25-35cm. Graze to 5-10cm	25cm. Graze to 5-10cm





# PLANTAIN

Plantain is a moderate drought tolerant herb with a fibrous, coarse root system that is best suited to dairy farm situations where the amount and quality of summer feed limits milk production.

Plantain is ideally used as a summer forage alternative to grasses. Whilst ME content may be similar, plantain remains better quality in hot summer conditions when traditional ryegrass loose quality.

Despite it's moderate drought tolerance, plantain still requires moisture to grow well; and under severe drought growth will be reduced. Plantain can be used as a standalone crop or a companion species in at Top Crop forage blend such as Top Crop Brassica & Herbs.

## SOWING

Plantain sowing can be adapted to a wide range of soil and climatic conditions (for example Autumn), however a Spring sowing using direct drilling & depths of no greater than 1cm is recommended as the plant develops quickly and will reach its full potential through Summer & Autumn.

Plantain prefers soils that are free draining, avoiding very wet soil types that can be water logged for extended periods of time. Avoid heavy clay soils. As a standalone crop the sowing rate is 8-10kg/ha.

## PLANTAIN BLENDS

In summer forage pasture mixes such as Top Crop Brassica & Herbs or Top Crop Brassica, Herbs & Millet plantain combines well to be added to a pasture mix at 0.5-2.0kg/ha. Plantain combines well white clover, red clover, chicory and temperate pasture grasses.

## FERTILISER

General pre-plant fertiliser programme includes Urea at 50kg/ha, MOP at 50kg/ha and Superphosphate at 100kg/ha - unless soil P and N levels are high. Plantain establishment will be vastly improved with the application of Nitrogen fertiliser (70 kg/ha Urea) and control of broadleaf weeds.

## INSECT & WEED CONTROL

Weeds should be eliminated before sowing as there are limited registered post emergent chemicals for plantain. Slug bait should be used as plantain seed can be vulnerable to slugs when emerging.

## KEY BENEFITS

- Summer forage alternative to grasses
- Highly palatable year round growing pattern
- A herb that can grow in a range of soils and climatic conditions
- High nutritive & mineral contents
- Quick to establish

## ORACLE PLANTAIN

### Late maturing and high forage yields

 Ready to Graze 50-70 days  6-10 kg/ha  Rocket fuel for livestock

A late heading, broad leaved plantain bred for high forage yields under grazing. Has very strong year-round growth, especially over the late spring, summer and autumn months. Has deep fibrous roots enabling good heat and drought tolerance. Highly suitable for all livestock types and for use as a specialist high quality forage crop, or as a component of permanent pasture mixes to improve summer quality. High forage quality for enhancing livestock performance.

## GRAZING MANAGEMENT

Plantain grows from a rosette, with its hairy long slender ribbed leaves with each leaf 8-20cm in length. Graze plantain 7-8 weeks following spring sowing & no earlier than the six-leaf plant stage to avoid plants pulling out.

Frequent grazing is recommended at a height of 25cm as as plantain leaves mature they become more fibrous, less digestible and the quality of the crop declines. In the traditional diet, dairy animals should graze 3-4 kg DM per day. Expect productive growth for 2-3 years.

Compared with ryegrass, Plantain also has greater mineral content (P, K, S, Ca, Mg, Na, Zn, Cu, B and Co)



# SUMMER LEGUMES CROPS

**Enhance soil quality by improvements in soil fertility, physical soil attributes and paddock ecosystem with summer legume forage crops.** Summer legume forage & cover crops are an excellent way to improve soil nitrogen levels by significant fixation or by incorporating green manure crops into the soil in southern parts of Australia. Nitrogen fixation is the summer legumes ability to extract nitrogen from the air and convert it to a form plants usually obtain from the soil - and then using it for positive plant growth.

Legumes are also excellent companions to summer grasses in forage & cover crops. We can custom blend many different legumes and companion species.

Late spring and summer rainfall patterns have a significant impact on which legumes can be used for summer sowing. Pasture legumes need high constant levels of soil moisture for germination and early development so please always seek advice from our team on the best legume to use.

## RED CLOVER

Red clover is a large leafed, semi erect summer active companion legume that is highly palatable with good livestock acceptance.

Sown in spring whilst good soil moisture available varieties such as Reaper Red Clover & Amigain Red Clover are a very palatable varieties with fine stems (less stalky than traditional red clovers) and are low in oestrogen levels.

In temperate areas and in grazing scenarios it is ideally mixed at 3-6kg/ha with the likes of forage millet, sorghum, chicory and plantain. Red clover is best on free draining soils under moderate stocking rates, long summer grazing rotations or hay production

# BUCKWHEAT

Buckwheat is a fast growing, short season spring, summer regeneration, cover crop, & potential grain cultivar that is planted for it's rapid growth to choke out weeds and attract beneficial insects & bees.

Buckwheat dense root system means it is a great mid summer soil conditioner before Autumn crops, with its abundant fine roots leaving the top soil loose before Autumn planting. Buckwheat grows well in low-fertility or acidic soils and can scavenge some phosphorus (P).

If used for a cover crop over summer, Buckwheat is ideally mown before seeds mature and left to decompose and protect the soil until the next sowing.

## COWPEAS

In subtropical and tropical areas, Cowpeas are ideal legume companion species with forage sorghum and millet to add nutrient value for a more balanced feed ration animal production.

Cowpeas are fast growing multi purpose legumes with spreading to fairly erect growth habits, growing up to 50-100cm high. Cowpeas are safe grazing, low bloat risk and nil prussic acid and farmers can safely graze stressed cowpea crops. The ideal time to cut a cowpea is about 70-90 days after sowing. Cowpeas are adapted to a wide range of soil types, with a preference of heavier soils and are sown at 20-25kg/ha as a standalone and 8-12kg/ha in a mix.

## LAB-LAB

More tolerant to heavy grazing than cowpeas, Lab-Lab is typically sown for grazing, forage conservation and as a break crop in subtropical and tropical farming systems.

Lab-lab is characterised by being easy to establish with thick, twining stems and large leaves. Lab Lab is short lived, however provides bulk dry matter over the warmer months. If grazing Lab Lab it should occur prior to flowering to maintain the maximum forage quality.

## TROPICAL LEGUMES

Our range of sub tropical and tropical legumes are suitable for a variety of soil textures in medium to high summer dominant rainfall zones. Our range includes Aztec Atro siratro, Caatinga stylo, Cardillo centro and V8 stylo.

Buckwheat is also available in our Multi Specie Pasture Blends.

**Green manure crop**

**Soil conditioning characteristics**

**Buckwheat branches freely, as opposed to tillering**

**Fast growing, short season crop**

**Attract beneficial insects and bees when flowering**

**Grows well in low fertility or acidic soils**

**Buckwheat is not drought tolerant**



# RED CLOVER

Red clover is a tap rooted short lived (2-5 years) perennial clover that has high feed value, nutritional qualities ideal for moderate stocking rates and well suited to making quality silage and hay.

In a pasture mixture, red clover provides spring, summer and autumn productivity ideal for increased animal performance, enhancing pasture and fixing nitrogen. With good drought tolerance, red clover can boost late spring & summer growth as well as feed quality.

## SOWING

For optimum re-growth and persistence red clover should be sown in rainfall areas above 600mm in well drained fertile soils. Red clover does not thrive on poorly drained soils or saline soils. As a standalone crop the recommended sowing rate is 2-8kg/ha. With companion species such as perennial and short term ryegrass red clover can be an addition at a sowing rate of 2-5kg/ha.

## RED CLOVER BLENDS

In summer forage pasture blends red clovers nutritional quantities combine well with companion species including chicory, plantain, forage rape, leafy turnip and forage millet.

## FERTILISER

To maximise performance of red clover adequate levels of phosphorous, potassium, sulphur and molybdenum should be maintained. This is due to red clovers extensive surface rooting system.

## INSECT & WEED CONTROL

Weeds can out compete young seedlings and lead to a thin stand of red clover. There are limited in crop herbicide options for red clover so its important eliminate weed and grass infestations before planting. Redlegged earthmite are a major pest of red clover, particularly at the seedling stage. Insecticides should be used when

### GRAZING RED CLOVER

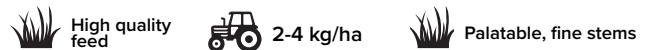
Livestock perform well when fed clover. Feed quality is significantly higher than perennial ryegrass offering increased palatability, intake and higher stock growth rates from late spring through to autumn.

In a pasture blend red clover can persist for 2-3 years if the crown of the plant is managed well. Longevity of the crown will depend on it's damage by cutting, grazing and trampling by livestock. Ideally red clover should be rotationally grazed or set stock for short periods at a time. As a standalone crop monitor red clover growth regularly especially in spring when growth is at its peak.. To maximise forage quality avoid grazing and or cutting beyond 25cm in height and graze down to a 5cm residual.



## REAPER RED CLOVER

Palatable and persistent red clover



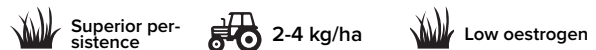
Reaper Red Clover is a high yielding, large leafed, semi-erect growing diploid red clover which is suitable for grazing and for hay and silage.

Reaper is a very palatable variety, with fine stems which are less stalky than traditional red clovers and is low in oestrogen levels. It has good disease resistance and strong persistence.

Reaper can be established in autumn or spring depending on local conditions. Establishment after a spring cropping program to eradicate weed burdens will achieve the best long-term results.

## AMIGAIN RED CLOVER

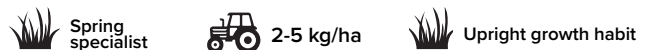
Excellent persistence and production



Superior persistence and production even under sheep grazing. Astred has been extensively trialled in many parts of Australia and consistently performed well. Suited to free draining soils, it makes high quality hay and is ideal for finishing lambs, cattle and dairy cows. Amigain was selected for low levels of oestrogen, reducing the risk of fertility problems in breeding animals.

## USA RED CLOVER

Spring silage and hay specialist



USA Red Clover is a spring specialist demonstrating an upright growth habit. Ideally suited to silage and hay pasture blends to boost quality and forage palatability



# MAIZE

Maize is one of the worlds most widely grown crops, offering very high yields for both grain and silage. The yield potential of maize will vary between districts and farms because of water availability, altitude, sunlight, soil structure and soil fertility.

Yield potential will also vary between seasons at the same site depending basically on the season (e.g. heat wave, drought) as well as choice of hybrid, sowing time and other associated management decisions (e.g. type and quantity of fertiliser applied and its timing).

The most profitable maize crop is obtained by optimising (rather than maximising) the key inputs such as seed, fertiliser and water.

Although too often farmers have effectively used the optimum level of inputs but have not achieved the optimum high yield – usually because of poor timing of inputs or poor crop management. The recommended steps will address each of these aspects of growing a profitable maize crop.

SEPT	OCT-NOV	DEC	JAN-FEB	MARCH	APRIL
Soil test Select maize variety Set yield targets Pre-order seed	Seedbed preparation Pre sowing fertiliser Pre emergent spray Powerharrowing	Nitrogen application Pest inspection Weed control Summer grass control	Regular crop inspections Prepare silage pit	Plan harvest logistics Select inoculant type Harvest Seal & roll silage stack	Sowing back to grass Feed test

## AUTUMN PREPARATION

Perennial weeds will cause a significant reduction in your maize yield if they are not controlled early. Autumn control is more effective since the plant is actively growing.

If the total area is infested with perennial weeds, spray out the whole paddock and plant a winter crop such as winter growing greenfeed oats or Italian ryegrass.

## SOWING TIME

To maximise potential yield we need to maximise the amount of sunshine energy (radiation) and heat units absorbed by the crop. In general, early sowing has higher yields than late sowing as the crop can reach full canopy cover earlier to take advantage of sunshine and heat units.

## SEEDBED PREPARATION

Bring the seedbed to a clump size no larger than a maize seed. A well-prepared seedbed enables weed control chemicals and insecticides to give optimum results, enhances crop establishment and allows planting machinery to function more accurately.

Maize does not perform well in waterlogging soils—encouraging weeds & summer grasses to invade the crop, reducing yields & contaminating the resulting silage crop. Waterlogged soils can impact harvest capabilities at the end of the crops life cycle.

Growers with hard setting soils should implement practices such as deep ripping to break hard pans and permanent beds or zero-till to improve moisture infiltration to the root zone of the crop.

Maize seed needs a minimum temperature of 12oC and rising to commence planting—so measure soil temperature (at depth of 5cm) at 9am over five consecutive days to determine appropriate planting time.

## FERTILISER

Maize crops have a high requirement for fertiliser, so it is important high rates of nitrogen, phosphorus and potash be applied before & during crop growth. Soil test is essential, and will indicate

A balanced fertility program is therefore a major step towards obtaining higher yields. As the roots begin to take over the job of nourishing the plant, shortages of major nutrients can seriously slow growth and development. Dairy effluent can be used as a nutrient source for maize provided the crop requires the nutrients and good effluent practices are followed.

A standard fertiliser application could entail 350 kg/ha Urea, 350kg/ha MOP (Potash) & 150kg/ha Superphosphate. At planting, apply 150-350kg/ha of DAP 5 cm to the side and 5 cm below the seed row to assist with seedling establishment.

Nitrogen side dressing is an essential part in maximising your maize silage yields, with an application of Urea (100-200kg/ha) at approx. 4 weeks post planting or just prior to row cover. Urea is the most commonly used nitrogen product, although calcium ammonium nitrate (CAN) is a worthy alternative if conditions look like remaining very dry

## PRE-EMERGENT

Pre-emergent Atrazine 900 & S-Metolachlor 960 herbicides will be most effective if incorporated into a well worked seedbed (within four hours of spraying) to a depth of 3-4cm. Clumps no larger than 5cm. To be most



effective it needs 10mm of rain, irrigation or good soil moisture.

## SOWING

Maize hybrids must be precision planted—choose a competent contractor for sowing and harvesting your maize for the most economical option.

Planting seed to a depth of 3.5-5cm is optimum for seed germination & development. If planted too shallow it can (1) delay or inhibit the development of brace roots which are the primary tools for water & nutrient uptake; and (2) expose seed to herbicide residues.

Each variety varies in seed size, so check the number seeds per kilogram & the optimum population of plants per hectare. This generally falls between 85,000 (dryland) & 100,000 (irrigation) plants.

Crop Emergence: From approx. 6 days after planting check crop emergence. Full emergence occurs 7 to 14 days from planting depending on temperature. Inspect daily for insect damage.

## WEED & PEST MANAGEMENT

Weeds and pests have a major impact on the yield and performance of the crop - so regular crop inspections will limit major damage taking place.

Paddocks out of long-term pasture often have a broad-leaf seed bank while paddocks previously run-out pastures often have grass weeds, e.g. summer grasses.

Maize is quite sensitive to weed competition in the early stages of growth up until it reaches about 0.8 m in height. Inter-row cultivation can be done up until the Maize crop reaches about 0.75 m in height. After that the crop canopy closes over and the Maize competes well with weeds. High clearance sprayers or aerial application are now the only options from this point forward.

The most effective control against the two most damaging insects to maize, Wireworm and Cutworm is ensuring a long (at least 5 weeks) fallow period. Control with Chlorpyrifos 500EC.

However, in most cases this is impractical, so it may be necessary when the fallow period is short to combine the use of an insecticide-coated seed & a post emergent herbicide.

## MILK LINE SELF CHECK

The whole plant dry matter can be estimated by looking at the milk line of the grain. To check whether your crop is in the range of 32-40 percent dry matter take a cob from a plant that is at least 20 rows into the crop. Break the cob in half and discard the end of the cob that was attached to the plant.

Hold the point of the cob downwards and remove a kernel from the snapped end. Keep the kernel the same way up as when you removed it from the cob. Slide your fingernail along the length of the kernel starting at the flat (dented) end of the kernel. On a 1-5 scale, with 1 being

containing no hard starch and 5 being black layer, the optimum chopping time is when the milk line is between position two and three on the kernel.

## IRRIGATED CROP

Timing of the final irrigation should enable the crop to survive on moisture in the soil until the crop is harvested. Ensure the crop is not moisture stressed leading into harvest. Grain fill is occurring through to harvest and limiting water will reduce yield. See our Maize Water Management section for more information on water requirements.

## HARVEST

The ideal time to harvest your maize silage crop is when the whole plant dry matter is between 32- 35%.

Harvesting too early will result in high losses as plant fluids run from the silage stack/bunker taking away valuable sugars. Late harvest may result in loss of quality—increasing in fibre and becoming less digestible.

Some hybrids only offer a 4-5 day harvest window, while others offer 8-15 days. This allows for harvest delays due to weather, machinery breakdown or contractor hold-ups. Harvest chop length should be 8-12mm average.

Ensure high quality inoculant are used. A good silage inoculant gives a faster, more efficient fermentation, resulting in less energy and drymatter loss and greater animal performance when compared to an untreated control.

## STORAGE & COMPACTION

For stacked silage, spread into 100-150 mm layers and compact until the surface is firm. The average density of a maize silage stack is approximately 200 kg of dry matter (DM) per cubic metre with a range of 150-275 kg DM per cubic metre. The average density of a maize silage bunker is approximately 225 kg DM with a range of 175-300 kg DM.

## SEALING

Cover stack with a quality plastic cover (minimum 125 micron thickness) and weigh it down with tyres that are touching. If using an old cover spray with disinfectant to kill any undesirable micro-organisms. Important to seal the edges to avoid silage spoilage.

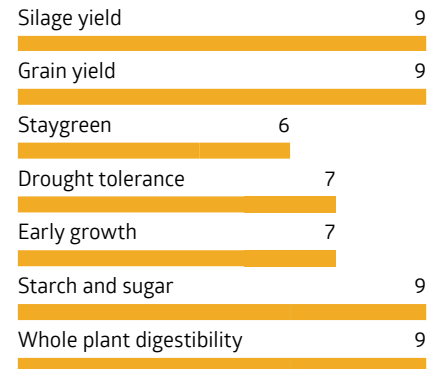
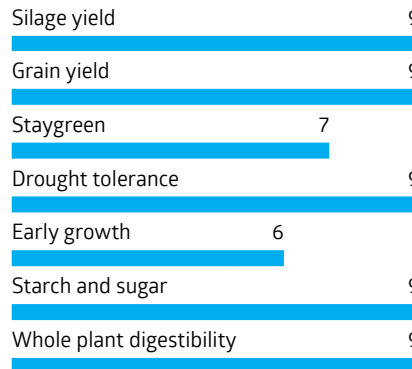
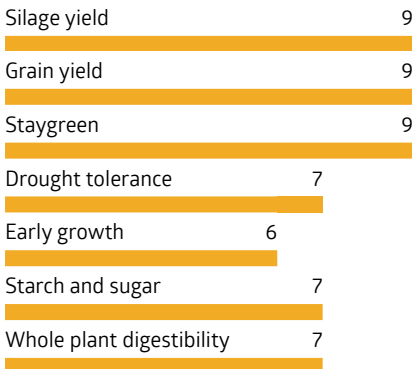
### WHAT IS COMPARATIVE RELATIVE MATURITY? CRM

CRM stands for Comparative Relative Maturity. It is a number used by Pioneer to compare the maturity of one corn hybrid compared to another. It is a 'unit less' number and should not be related directly to 'days'. For example, it is not a number that refers to the number of days from planting until physiological maturity, as this will vary greatly with planting time and seasonal conditions. Generally, a hybrid with a smaller CRM will flower, fill grain and be ready for harvest more quickly than a hybrid with a larger CRM.

## HYBRID SELECTION

Aside from a research, hybrid development, quality control and a solid agronomy package, the main difference between hybrids are the number and silage yield for maturity, crop maturity (growing days to harvest), and ability to cope with stresses such as drought. Selection criteria also include these factors:

<b>GRAIN YIELD FOR MATURITY</b>	9 = High yield for the CRM	Valid to compare hybrids of similar maturity CRM (+/- 4 CRM)
<b>COB ROT RESISTANCE</b>	9 = Show very high resistance to cob rot	
<b>SILAGE YIELD FOR MATURITY</b>	9 = High silage yield for maturity	Valid to compare hybrids of similar maturity CRM (+/- 4 CRM)
<b>HUSK COVER</b>	9 = Complete coverage of grain through to harvest	Measure the length and tightness of the husk cover
<b>DRYLAND ADAPTABILITY</b>	9 = Ability to handle hot dry stress conditions	
<b>STAYGREEN</b>	9 = Excellent ability to maintain green leaves during grass fill and good late season plant health	
<b>PLANT HEIGHT</b>	9 = Tall 1 = Short	
<b>NORTHERN LEAF BLIGHT</b>	9 = Completely free of Northern Leaf Blight (very high resistance)	
<b>WHOLE PLANT DIGESTIBILITY</b>	9 = Very high whole plant digestibility	

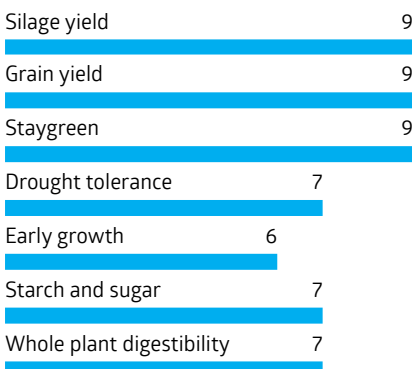


### CRM 85

#### P8500

##### Yield leader with looks to match

A silage yield leader which has a solid agronomic package with greater standability, drought tolerance and staygreen for a wide harvest window.



### CRM 99

#### P9911

##### Unmatched silage performance

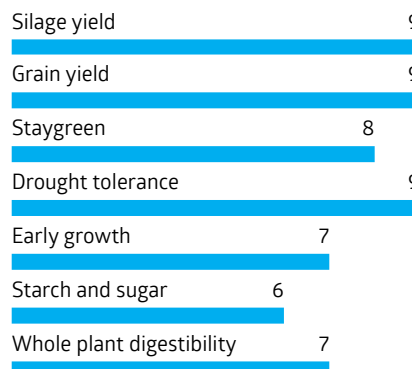
P9911 is a dual-purpose, AQUAmax quick-season hybrid offering unmatched silage performance and yield stability. Offering growers excellent grain yield for maturity this is an ideal option for grain growers in cooler climates aiming for field dry down. P9911 has excellent staygreen to maximise silage starch content, this hybrid combines the best of bulk and energy for maximum milk productivity. A tall impressive plant with outstanding dryland

### CRM 91

#### P9127

##### Bred to yield, designed to impress

Early maturing AQUAmax variety offering yield stability for silage and grain. A tall plant with strong roots, stalks, drought tolerance and staygreen combined with superior Northern Leaf Blight, Eyespot and Rust resistances which together deliver striking late season eye appeal. Widely adapted to all growing regions where a hybrid of this maturity is required.



### CRM 107

#### P0725

##### Superior dryland adaptability

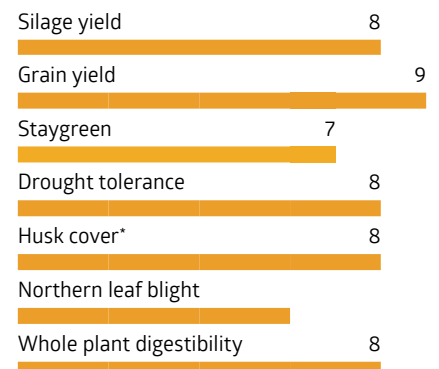
Superior dryland adaptability provides resilience when it's dry and yield responsiveness with favourable growing conditions. P0725 AQUAmax delivers outstanding yield stability for grain and silage in all early to mid season production regions A tall plant with upright leaves, sound standability and excellent staygreen.

### CRM 94

#### P9400

##### Stands tall, delivers big time

P9400 is a feed and grain silage hybrid with an excellent agronomic profile. A tall dense plant producing high grain content silage with superior digestibility. Strong agronomically with a sound disease resistance offering. Offering outstanding grain yield for maturity, strong early growth and good stress tolerance.



### CRM 111

#### P1197

##### World record holder for grain

P1197 is a world record holder for grain yield - now available in Australia. With access to the best corn genomics in the world, we are pleased to have trialled and tested P1197 for a number of years in our extensive trials program, and to now have confidence in its ability to perform for Australian corn growers. Responds to intensive management on both high yield dryland and irrigated cropping, with excellent defensive traits for a mid season hybrid





Silage yield	9
Grain yield	9
Staygreen	8
Drought tolerance	8
Husk cover*	8
Plant height*	9
Whole plant digestibility	8

**CRM 113**

**P1315-IT**

**Mid season IT hybrid**

A uniquely Australian bred hybrid developed for the processing market with the addition of Imidiazilinone tolerance for better weed control. High yielding trials have proven this hybrid to perform exceptionally well. Suitable for irrigation or dryland farming enterprises. With a combination of excellent stalk strength, staygreen and dryland adaptability makes this hybrid a perfect fit for either a early or late planting window.

Silage yield	9
Grain yield	9
Staygreen	7
Drought tolerance	8
Husk cover	7
Plant height	8
Whole plant digestibility	8

**CRM 114**

**P1467**

**Pioneer's highest yielding grain hybrid.**

Pioneer's highest yielding feed grain hybrid. A full season hybrid with superior early growth, dependable dryland adaptability and solid agronomics delivering outstanding silage yields. Offering a strong trait combination of stalk strength, dryland adaptability, staygreen and cob rot resistance. The first choice for farmers wanting high silage yields.

Silage yield	9
Grain yield	9
Staygreen	7
Drought tolerance	8
Husk cover	8
Plant height	7
Whole plant digestibility	8

**CRM 118**

**P1888**

**Full season dual purpose hybrid**

Next generation high yielding gritting corn hybrid which is widely adaptable across dryland and irrigated farming systems and multiple environments. A tough hybrid providing growers with production stability, all-round agronomics and a strong disease profile. It has a large blocky grain with a vibrant colour that is highly desirable in the processing industry.

## MAIZE WATER MANAGEMENT

The relationship between a crop's growth and water is best shown by drawing the water requirement curve over the weight gain curve. Water requirements each week as a percentage of total water needs,

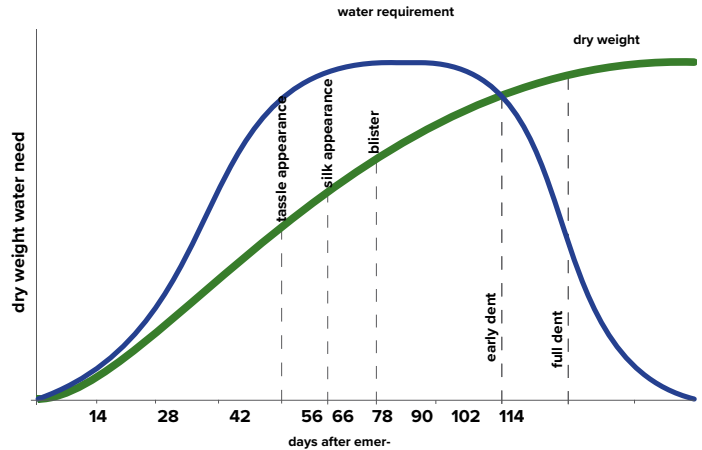
- 20% in the first 5 weeks after emergence
- 33% in the next 3 weeks (the three weeks prior to silking)
- 31% during the next 3 weeks during silking and early grain fill

### When is water needed?

Water need increases rapidly from about two weeks prior to tassel and ear appearance until about two weeks after full silk and then decreases rapidly. Figure A only compares water need & dry weight accumulation on a days after emergence basis. Research shows that the total amount of water used by high yielding crops is only slightly more than that used to produce low yields. Weed control, fertiliser, plant population & maize variety are crucial factors to minimising water usage.

### Making the most of limited water

It is generally considered that yield is lost when corn is visibly wilted for four consecutive days. When corn plants become stressed, the lower parts of the plant wilt and suffer damage proportionately more than the upper parts. Hybrid varieties play an important role in yielding well in spite of considerable moisture stress



WATER REQUIREMENTS OF CORN (DRY WEIGHT GAIN)

## MAIZE FEED OUT MANAGEMENT

Keep the face of the maize silage stack tight throughout the feed-out period, preventing air to penetrate into the stack. Allowing (oxygen loving) bacteria access to break down the plant material will produce carbon dioxide, heat and water.

Careful use of the tractor bucket at feed-out time will minimise loosening of silage. Avoid digging into the stack as this loosens silage that will not be fed for several days. Scoop out the lowest section of silage, then using the bucket blade, chip down the silage one section at a time from bottom.

Introduce maize silage into the diet over a period of 5-10 days. Start by allocating each animal 1-2 kg dry matter and increase the amount that you feed each day

### IMPORTANT TIPS

- Keep face of maize silage stack tight
- Never feed mouldy or rotten silage to your animals.
- Careful use of the tractor bucket at feed-out time will minimise loosening of silage.



## INSECT PESTS OF MAIZE

**Knowing if insects are prevalent is the first management step—don't be caught unaware!** Maize crops are most susceptible to serious damage from insects during establishment (soil insects can be so destructive that resowing is necessary) and from tasselling, silking until harvest.

Insects attack all parts of the maize plant and attack the plant through all stages of plant growth, however its especially important to regularly monitor crops in the first two months of growth



- (1) False Fireworm
- (2) Black field earwig
- (3) Wireworms
- (4) Cutworms
- (5) Thrip damage
- (6) Spider mite damage
- (7) Corn Earworm
- (8) Corn aphids

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(J Wessels & D Ironside)



# MILLET

Forage millets are quick to establish highly productive summer forages for dairy, beef, sheep & silage, with dry matter yields between 8-12 tonne/ha. The tall leafy grass with a thin stem grows to around 1.5m in height. Compared with forage sorghum, temperate Millets can be sown earlier and will grow into late summer/early autumn. Millet is great for your pasture renovation program.

Millet, a low cost option for summer feed, is a safe forage for your animals—containing no prussic acid (HCN) and does not require supplementation with sulphur or salt blocks.

## SOWING

Mouldboard plough to a depth of 10cm with no grass showing in deep soils. In shallow soils there are a number of options including disc cultivation to level & break down clump size (two passes) followed by fertiliser spreading & pre-emergent spraying before final pass.

To optimise yields, target soils that have a high level of moisture retention and drill seed to a depth of 1cm (extend to 2cm in sandy, dry soils) at a rate between 10-12kg/ha (lighter/poorer soils) & 20-40kg/ha (heavier, fertile soils with irrigation).

## MILLET FORAGE BLENDS

Forage millet combines well with summer active red clovers, chicory and brassicas to add quality to the pasture. Top Crop forage blends including Millet & Rape and Millet & Brassica have delivered proven production performance for Australian farmers across the summer and early autumn periods.

## FERTILISER

To achieve peak yields, an application of 150kg/ha DAP fertiliser is recommended when sowing. Phosphorus and potassium fertilisers are also important to achieve optimum crop production.

To enhance quantity of grazing feed apply 100kg/ha of Urea following each grazing if moisture is available. This is especially relevant if chasing late season production.

## WEED & PEST CONTROL

Similar to forage sorghum, if Millet is sown into a weed-free seedbed, the rapid growth rate of forage millet usually overcomes any weed problem. Dicamba 500 can be sprayed as a post emergent broadleaf control up until millet is up to 30 cm in height. Weed control is limited if millet is combined with other cultivars such

as herbs, legumes and brassicas

Wireworm and cutworm can cause significant loss of seedlings in newly sown crops in some regions. Regular monitoring of millet in early stages is advised to ensure pests are controlled if evident.

## GRAZING MANAGEMENT

Forage quality is dependent on the soil type, fertility and maturity of plant. As the plant matures feed quality reduces. Forage palatability is high for millet. Shirohie Millet does not contain prussic acid which can be in sorghum

Forage millet should be grazed when plants are well anchored into the ground. To achieve this the first cut or graze should be when the plant has reached 30-35cm. Under ideal conditions this can be 6 weeks after sowing. Frequently thereafter graze at 30-35cm to prevent Millet running to head. Shirohie like all millets can run to head when under stress or high summer temperatures resulting in a decline in feed quality.

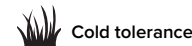
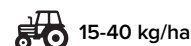
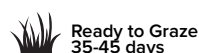
## HARVEST

Millet is best cut at or before the early head emergence stage for silage and hay. This is at approximately 70cm with a mower conditioner in January. After conservation, consider applying 150kg/ha of Urea (if moisture available), if aiming for another harvest in



## SHIROHIE MILLET

**Fast growing low cost summer feed**



Shirohie Millet is a highly productive summer leafy forage crop that grows when you need it in summer. The fast growing versatile forage provides forage for grazing, hay and silage. Excellent regrowth potential when good moisture and nitrogen levels are available. Shirohie Millet is also available in our Top Crop blends.



# SORGHUM

Forage sorghum hybrids deliver large quantities of quality feed for grazing, hay or silage. There are large variety of forage sorghum to choose from, each with different characteristics—such as the cold tolerance fast early growth, re-growth capabilities, fodder conservation quality and more.

## SOWING

Target planting date should be around mid-late November in most southern regions, earlier for northern Australia. Preparing a fine seedbed will greatly assist crop establishment. Target heavier soils with high moisture retention & no clay or impermeable layer close to the surface — giving you the best chance of high yields. If soil moisture retention is poor, we suggest planting millet as a summer grass crop. Moldboard plough the paddock to a depth of 10cm ensuring that no grass is left showing. If soil is too shallow to use a moldboard plough, there would be a concern the paddock may not return a high yielding sorghum crop.

## FERTILISER

The ideal soil pH range for this forage sorghum seed is 5.5 - 8, and the phosphate level should be greater than 20 ppm. In acidic soils, lime should be applied and incorporated during seedbed preparation.

To achieve peak yields, an application of 150kg/ha DAP fertiliser is recommended when sowing your forage sorghum seed. Power harrow (to a depth of 7cm) to incorporate fertiliser.

For grazing crops apply Urea after each grazing (100 kg/ha) if moisture is available - this will ensure quicker regrowth & maintain feed quality for your animals. For harvested crops apply Urea again (150 kg/ha) if moisture available if aiming for another harvest in early March.

The rate of nutrient removal from the soil can be huge if dry matter yields are high. One tonne of dry matter of sorghum will remove approximately the following: Nitrogen 28 kg, Phosphorus 3.5 kg, Potassium 20 kg, Sulphur 2.5 kg, Calcium 3 kg and Magnesium 3 kg.

## INSECT & WEED CONTROL

If sown into a weed-free seedbed, the rapid growth rate of forage sorghum usually overcomes any weed problem. If weed control is required, atrazine can be applied post-planting pre-emergent. For

broadleaf weeds, 2, 4-D can be used with care at the seedling stage when the crop is 7-15 cm high and secondary roots have developed. Care must be taken when spraying herbicides, especially in sandy soils. Check crop regularly for pest infestation (e.g. wireworms &

## GRAZING & HARVEST SORGHUM

Forage sorghum cross sudan-grass hybrids produce feed with an average energy content of between 9.0 and 10.0 MJME/kgDM depending on crop maturity at harvest time.

Aim to graze when sorghum when the quality of the feed - protein & energy - is at its peak between 0.8m-1.5m (dependent on variety). Sorghum crops can be regrazed approximately 30-35 days after first grazing again when crop has reached at least 0.8m in height.

Betta Graze is a late flowering plant, and has better mature leaf retention than other sorghums, it will become rank and lose quality if left too late before grazing or cutting. It's important not to graze sorghum too early (under 0.8m in height), as there are risks of prussic acid poisoning with stock & fresh growth.

As plants get older and taller, fibre content rises and animal intake declines. However, with sweet sorghums like Mega Sweet and SSS the sugar content reaches a peak in the older growth, so they can be efficiently used for fattening at a later stage. Sudan grasses like SSS have finer stems and leaves and better leaf-to-stem ratio than sorghum.

## SILAGE INOCULANT

Inoculant adds significant value to your investment in silage. Pioneer® inoculants improve the fermentation in the stack or bale, reduce losses to shrinkage and improve the performance from silage when fed to stock.

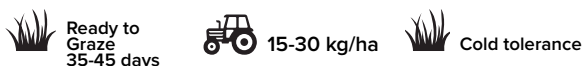
## SORGHUM OPTIONS

<b>Cold tolerance</b>	Betta Graze
<b>Intensive grazing</b>	Betta Graze, Super Sweet Sudan
<b>Green chop</b>	Betta Graze, Super Sweet Sudan
<b>Silage bales</b>	Super Sweet Sudan
<b>Hay bales</b>	Super Sweet Sudan
<b>No prussic acid issues</b>	Forage Millet



## BETTA GRAZE

### Fast to feed, excellent cold tolerance



Excellent recovery from grazing or cutting, the fast growing nature of Betta Graze and its cold tolerance, mean it is the first forage sorghum you can plant and the first you can feed to any type of livestock.

A drought tolerant sorghum x sudan grass hybrid with water use efficiency more than 70% higher than perennial ryegrass, Highly suited to grazing, hay production and round bale silage.

Betta Graze requires a minimum soil temperature of 17°C for quick germination and establishment - with sowing general not recommended before late November-early December. Strict management is required to realise full genetic potential and quality. Graze early and often.

## SUPER SWEET SUDAN

### Grow more for less



Grow more with less - High quality smaller seed means you plant more hectares with less kilograms. A unique Australian product, bred for Australian conditions, Super Sweet Sudan (SSS) is quick to graze and sustains multiple and intensive grazings.

Adaptable for early or late planting. SSS has proven that it has wide area adaptability and flexibility due to the highly palatable sweet stems and excellent leaf mass at all stages of maturity. These features give you grazing and hay making flexibility that other summer forages will struggle to match.

## PRUSSIC ACID

Forage sorghums can release the toxic compound hydrogen cyanide (HCN) causing prussic acid poisoning.

Prussic acid is a potent, rapidly acting poison, which enters the bloodstream of affected animals and is transported through the body. It then inhibits oxygen utilisation by the cells so that, in effect, the animal dies from asphyxia.

If you are concerned about (HCN) then the following information may be useful. Sorghum plants may be low in sulphur and feeding sulphur will reduce the risk of prussic acid problems.

Supplementation of sulphur is recommended if the pasture sulphur is low (less than 0.25%). To supplement sulfur, consider the use of sulfur blocks near watering points. Also ensure animals have a full stomach before

### Factors which increase the level of prussic acid include

Young plants	Avoid grazing crops under 0.8 m high.
Drought	Severe moisture stress.
Frost	Levels rise after light frosts. If crop is killed by frost, wait 5 days to graze.
Nitrogen	Very high available soil nitrogen may lead to higher levels, as does large amounts applied.
Low phosphorus	Inadequate or deficient soil phosphorus.
Re-growth	Cutting or grazing is a stress on plants, wait until plants are at least 80 cm high.
Herbicides	Applying 2, 4-D may raise HCN level.

## FORAGE SORGHUM SILAGE

The optimum harvest window for precision chop forage sorghum is dependent on the target dry matter (see table). This will maximise yield, quality and stack fermentation.

Early harvest will result in yield losses and potentially poor fermentation whilst a late harvest may result in a loss of quality as plant stover (leaf & stalk) increase in fibre & becomes less digestible.

Wilted forage sorghums need to be harvested before forage quality starts to decline rapidly. This is normally around 0.8m – 1.2m in height. The forage will need to be wilted to achieve the target dry matter range (see table)

Mowing with a mower conditioner and using a crimper machine will be an advantage. The aim is to achieve the target dry matter within 48 hours to maximise quality. With baled silage and wilted forage sorghum it is important to minimise contamination from dirt as the contamination will put the fermentation at risk.

Crop	Target harvest dry matter	Typical energy ME	Typical crude protein %
Precision chop	28-35% DM	9 - 10.5	6-9%
Wilted forage sorghum	35-40% DM	9.5-10.5	10-16%

# AG CHEMICAL

## SUPPORTING YOUR FARM WITH QUALITY ADVICE

We offer you access to a wide range of high quality affordable agricultural chemicals including herbicides & insecticides to eradicate pests and protect your crops. Our staff are experienced in providing advice about chemicals for agricultural purposes and will focus on a strategy to manage your farm and crops for long-term health.

-  **SPRAYOUT**
-  **HERBICIDES**
-  **INSECTICIDES**
-  **GROWTH PROMOTANT**
-  **ADJUVANTS**
-  **TANK CLEANER**



### CORRECT MIXING ORDER

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10	Step 11	Step 12
Fill tank to at least 70% full with suitable water <b>Commence agitation</b>	Water Conditioner  AMS Adjuvant, Probuffer 700	WP Wettable Powders	WG Water Dispersible Granules  Atrazine 900WG Flumetsulam 800WG	OD Oil Dispersion	Ensure fully dispersed before proceeding	SC & FL Flowable Liquids or Suspension Concentrate  Scanner 500SC, Onslaught 200SC	EC Emulsifiable Concentrate  Chlorpyrifos 500EC, Alpha-cyber 100EC	EW & SW Emulsion Oil in Water or Suspension Emulsion  Cobalt™ Advanced	Fill the mixing tank to nearly full	SL Soluble Liquids  2-4,D Amine 625, MCPA Diflufenican, MCPA 750SL	Add other Adjuvants and fill the tank  Wetter 1000

\*Always read the product label for the manufacturer's tank mix recommendations and to determine individual product compatibility options and correct mixing orders for individual products. If unsure, perform a jar test before proceeding to determine physical compatibility. Physical compatibility does not always guarantee biological compatibility.

### EQUIPMENT CLEANING

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Flush out sprayer with clean water. Half fill the spray tank and commence agitation.	Slowly add the required quantity of Tank and Equipment Cleaner.  150-250g per 100L. 25 g per 10 L for nozzles & screen filters	Top up the tank and agitate vigorously for 15 minutes.	Use hand lance or return hose (where suitable) to clean top of tank around filter basket etc.	Open spray booms and spray out.	With persistent chemicals or when cleaning at end of season, allow mixture to stand overnight before spraying out.	When sprayer is to be re-used immediately, re-fill the tank with water, agitate for 5 minutes and spray out.	When storing sprayer for any length of time, do not give final rinse until required for use, as Tank and Equipment Cleaner leaves a protective film.

Notman Pasture Seeds equipment cleaner is a specially-formulated boom and tank cleaner that will decontaminate Spray tanks, hoses and all other spray equipment. Suitable for all pesticides including Sulfonyl Urea compounds and Phenoxy-based herbicides such as 2,4-D and MCPA.

# AGRONOMY TEAM

**NOTMAN**  
PASTURE SEEDS

## TERRITORY MANAGERS



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