



GUIDE

 PGG Wrightson *Seeds*





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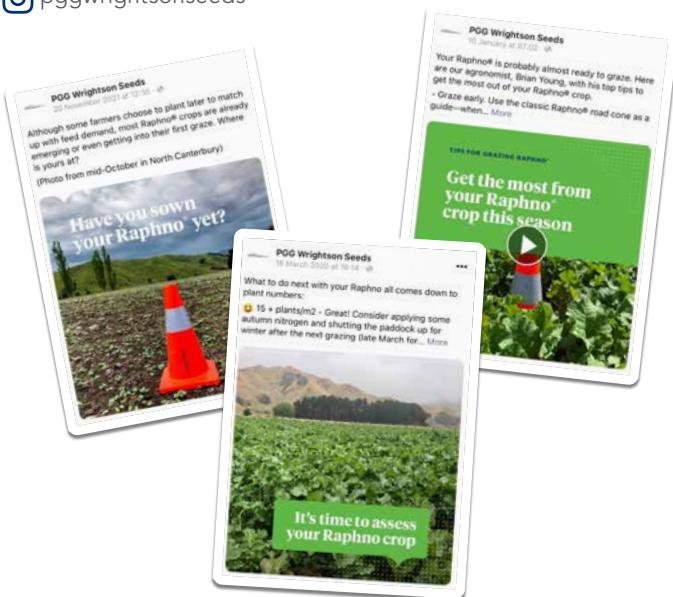
Check the PGG Wrightson Seeds Facebook page for regular updates on Pallaton Raphno®, the latest advice and occasionally, chances to win. Also join us on our Instagram page to stay up to date with what's happening in the field.

Do share your photos and stories with us via social media, as we love hearing them and having the opportunity to link with the wider PGG Wrightson Seeds community.

Be sure to use #Raphno!

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PALLATON PERFORMANCE: AGRONOMIC TRIALS

HIGH YIELDING

■ Harvest 1 ■ Harvest 2 ■ Harvest 3

Cumulative yield of three consecutive harvests, analysed by meta-analysis of eighteen trials from 2013 to 2019 on three sites, showed 'Pallaton' produced 16,254 kg DM/ha, which was more than 'Titan' (12,639 kg DM/ha), and 'Pasja II' (10,965 kg DM/ha) (Dumbleton et al., 2021).



*The development of Pallaton raphanobrassica for New Zealand farming systems
Dumbleton, A, Box, G.M., Foley, F, Westwood, C.T., & Wright, E.M. (2021)*

CLUBROOT TOLERANCE

Pallaton Raphno® has a high tolerance to clubroot. *In vitro* inoculation pot trials and field trials to date have shown strong tolerance to Pukekohe, Hawke's Bay and Southland strains of clubroot. Although Pallaton is highly tolerant to clubroot it is still susceptible to other brassica diseases.



*Forage rape (left) and
Pallaton (right) under
clubroot pressure.*



PERSISTENCE UNDER MULTIPLE GRAZINGS

100% increase in plant survival relative to forage rape under dryland sheep grazing management.



FLEXIBILITY

Graze Pallaton as early as 50 days* after emergence (DAE), to maximise crop utilisation and regrowth potential. It can be deferred up to 100 DAE, however crop utilisation, regrowth potential and feed quality will be reduced. Pallaton does not have a specific maturity requirement.

**Refer to page 9, Grazing Management.*



DROUGHT TOLERANCE

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



GRAZING PALATABILITY

Pallaton has shown increased **palatability** relative to forage rape and leafy turnip brassicas.



Lambs preferentially grazed Pallaton over forage rape in central Hawke's Bay. There was no fence between the strips of cultivars.

APHID TOLERANCE

32% increase in Aphid tolerance relative to forage rape. Pallaton also has a higher level of tolerance to White Butterfly and Diamondback Moth.



Forage rape (left) and Pallaton (right) under Aphid pressure. Both plants have had identical treatment and are in side-by-side plots.

MORE MEAT PER HECTARE

Our trials showed Pallaton delivered 41% more meat per hectare compared with chicory. **Pallaton Raphno®: total 390 kg/ha** versus **chicory: total 276 kg/ha**



**Trial completed by PhD student Holly Phillips at Massey University. Meat per hectare data was captured over the period 17/01/2020 to 01/05/2020. For more information, refer to page 17*

A close-up photograph of several young green seedlings with rounded leaves growing out of dark, rich soil. The seedlings are in various stages of growth, with some showing more developed leaves than others. The background is a soft-focus view of the soil and other seedlings.

GROWER GUIDELINES

In order to obtain maximum value from your **Pallaton Raphno**[®] crop, best practice management is essential.

CROP ROTATION

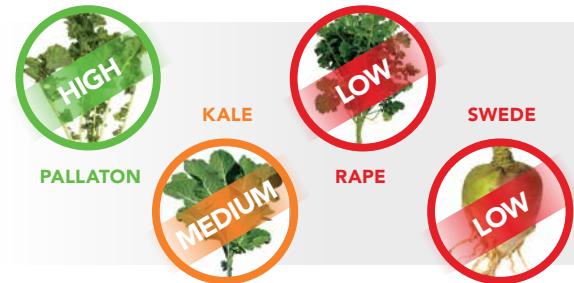
Use **Pallaton Raphno®** as part of a sensible crop rotation.



Pallaton has a high tolerance to clubroot and can be used as a second crop option. If there is a high risk of clubroot or dry rot infection, it is recommended to sow the paddock in either pasture or a cereal crop.

Brassicas (including Pallaton) should not be planted more than two years in a row in the same paddock. There should be a minimum of five years before brassicas are resown into the same paddock.

CLUBROOT TOLERANCE THRESHOLD OF FORAGE BRASSICAS



GROUND PREPARATION

Conventional Sowing

Spray the target paddock out with a recommended rate of glyphosate and penetrant. At least three days following spray out, hard graze to remove existing vegetation prior to cultivation.

Cultivate to prepare a **FINE, FIRM** and **WEED-FREE** seedbed. Spray with an insecticide after sowing.

No-Tillage

Best practice is to double-spray, with the initial spray out at least six weeks prior to sowing. A second spray with glyphosate occurs prior to drilling and should include an insecticide.

Always use slug bait when direct drilling.

PRE-SOWING FERTILISER

It is recommended that paddocks to be sown into Pallaton are soil tested at least six months prior to sowing so nutrient deficiencies can be corrected prior to crop establishment.

All brassica crops respond strongly to nitrogen and phosphate. Fertiliser should be either applied during the final cultivation and worked into the seed zone OR applied down the direct drill below the seed.

Optimum soil fertility is important in order for the plants to continue to perform over multiple grazings.

SOWING

Pallaton Raphno® is sold by the hectare, and is sown at a rate of **8 kilograms per hectare (kg/ha)**. Pallaton seed should be sown at a depth of approximately 10 mm and the seedbed rolled until firm. Sow at soil temperatures of 10-12°C and rising.

All Pallaton seed is treated with **Ultrastrike®** brassica seed treatment. It contains a systemic insecticide, two contact fungicides, and the trace element molybdenum. Ultrastrike treated seed has a grazing withholding period of **42 days after sowing**.

Continue to monitor Pallaton for seedling pests in the first weeks of establishment. This includes Springtail, *Nysius* and Slugs.



Ultrastrike
brassica.

DRY MATTER YIELD ASSESSMENT

Assess the amount of feed (kgDM/ha) on offer prior to grazing in order to calculate the allocation AND/OR stocking rate of the Pallaton crop.

It is important to send a sample away for dry matter (DM) testing when assessing crop yield, as use of an assumed DM percentage can significantly over- or under-estimate available feed.

Unlike other brassicas, Pallaton has no specific maturity date. Therefore the plant may continue to grow either underfoot or ahead of the animals in favourable conditions.



SPRINGTAIL:

Ultrastrike® brassica seed treatment will provide seedling protection. If identified in the crop, apply an insecticide.



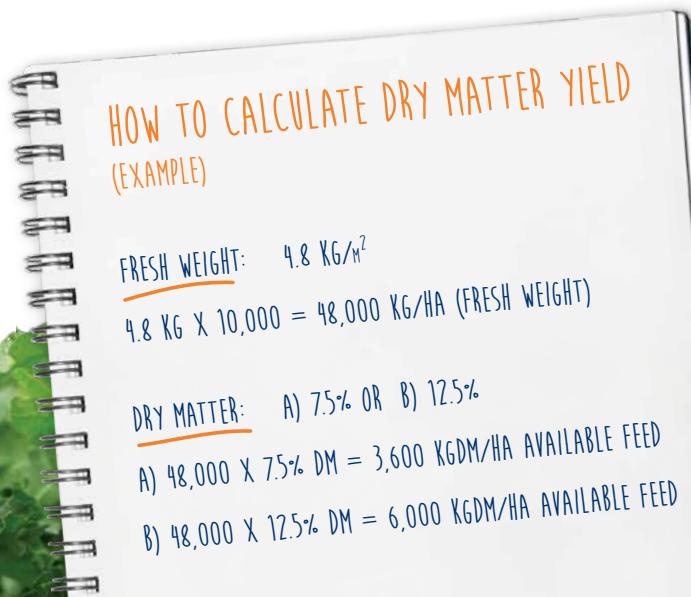
NYSIUS:

Ultrastrike® brassica seed treatment will provide some seedling protection. Apply an appropriate insecticide before or after sowing to high risk paddocks.



SLUGS:

Always apply slug bait in direct drill situations.



CROP MONITORING

Like all crops, an insect prevention programme is required around the time of sowing to ensure the best chance of seedling establishment.

Consult your accredited Agent/Retailer for assistance with this.

Pallaton has a strong tolerance to Aphids, and has also shown a high level of tolerance to White Butterfly and Diamondback Moth compared with forage rape. Pallaton has a similar susceptibility to Leaf Miner as with other brassicas and will require monitoring.

Any ag-chemical recommendations should be made by your local accredited Agent/Retailer representative. Pallaton is a forage brassica and chemical recommendations should be made accordingly.



ARGENTINE STEM WEEVIL:

Ultrastrike® brassica seed treatment will provide seedling protection for the first six weeks of establishment. If identified in the crop, apply an insecticide.



GREASY CUTWORM:

Apply an appropriate insecticide as soon as damage is seen.



APHIDS:

Ultrastrike® brassica seed treatment will provide seedling protection for the first six weeks. If identified in the crop, apply an insecticide.



LEAF MINER:

Apply an appropriate insecticide when early damage is identified.



DIAMONDBACK MOTH:

Apply an appropriate insecticide when early damage is identified.



WHITE BUTTERFLY:

Apply an appropriate insecticide when early damage is identified.

PESTS



ALTERNARIA:

Plough cruciferous residue in completely and use long crop rotations. Utilisation of infected leaf tissue can reduce impact of infection.



BLACK ROT:

Be mindful of crop rotation and bury previous crop debris.



CLUBROOT:

Be mindful of crop rotation with brassicas.



DOWNY MILDEW:

Plough cruciferous residue in completely and use long crop rotations. Utilisation of infected leaf tissue can reduce impact of infection.



DRY ROT:

Be mindful of crop rotation and minimise crop residual in second year crops.



WIRESTEM/ DAMPING OFF:

Ultrastrike® brassica seed treatment will provide seedling protection.

DISEASES

GRAZING MANAGEMENT

Animal performance can be enhanced by good feeding management. It is important to ensure these feeding guidelines are followed.

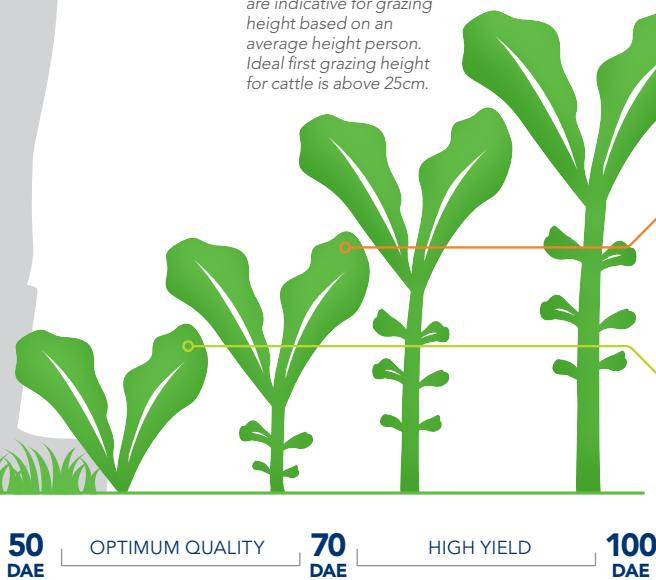


TIP

Check that Pallaton plants are strongly rooted into the ground prior to being grazed by cattle.

Cattle are a great management tool to control Pallaton crops that have grown too quickly and become too tall for sheep to effectively utilise. Graze tall crops with cattle before shifting sheep onto the crop to graze the short, fresh and better quality regrowth.

Note: knee and gumboot height in the illustration are indicative for grazing height based on an average height person. Ideal first grazing height for cattle is above 25cm.



Optimum crop height for good crop utilisation for CATTLE



Optimum crop height for good crop utilisation for SHEEP



1 Transition animals on to Pallaton Raphno®

Pallaton is typically a very palatable brassica, so stock acceptance can be relatively quick compared to other brassicas. However, it is important to allow time for stock learning to graze a new type of feed and the rumen time to adjust to a change in feed.

Sudden unrestricted access to brassica crops can upset the balance of rumen microbes, resulting in animal health challenges such as scouring and rumen acidosis. For the first two weeks, it is important to manage the gradual transition from pasture to brassica and to monitor stock health. Start by grazing the crop for no more than one to two hours per day. Ensure plenty of long-stem fibre supplements (baleage, silage, hay and/or straw) is available to stock. During transitioning, increase feed allocation of brassica crops in small 15-20% increments every two days, building up to a maximum allowance over at least 10-14 days. A **full rumen** is required before animals are shifted onto crops.

2 At all times, give animals access to fresh water

Although the water content in brassicas is high, animals must have access to fresh water at all times. Restricted water intake causes animal dry matter intake to decline.

3 Feed extra fibre prior to and while grazing Pallaton, and feed as part of a balanced diet

Pallaton is highly digestible and does not contain much 'effective fibre'. Offer animals a source of fibre while grazing crops, and ensure the supplementary fibre is good quality.

Feeding extra fibre means:

- More chewing and increased salivation to help maintain rumen pH
- Slower flow of feed through the rumen and gut for a more effective rumen fermentation
- Increased cud chewing to support good digestion, which in turn helps to prevent gorging, facilitates rumen microbes adjustment to the feed and maintains normal rumen function

Once feed transition is complete, offer:



No more than 80% of the diet as crop for dry stock



No more than 35% of the diet as crop for lactating cows, due to risk of brassica milk taint

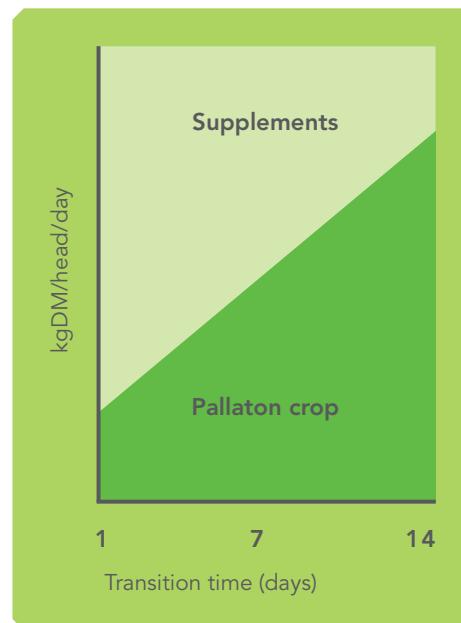


At least 20% of the diet as good quality fibrous supplement or runoff pasture for non-lactating dairy cattle, beef cattle and sheep*

**Runoff pasture may not provide adequate fibre intake for cattle, therefore it is recommended that a quality fibre supplement is offered.*



As with any brassica, Pallaton can be associated with brassica related animal health problems such as ruminal acidosis, photosensitivity, nitrate toxicity and brassica bloat. Contact your veterinarian for more advice.



LAMB GRAZING FOCUS

For the best opportunity to maximise feed quality, increase crop utilisation by lambs and optimise regrowth potential of **Pallaton Raphno®**, follow these lamb grazing guidelines.



PALLATON RAPHNO® GRAZING INDICATOR FOR LAMBS

To optimise the multi-graze capabilities of Pallaton Raphno®, we recommend using the grazing indicator road cone to help with lamb grazing management decisions.



1

PLANT, WAIT AND WATCH

Identify a position for your Pallaton cone in an average area of paddock.

Think about what stock classes you have available.



2

GRAZE!

Once Pallaton reaches the reflective strip on the cone get in and graze.

Note: It must be at least 42 days since planting before grazing can commence.



3

YOU ARE MISSING OUT

Once Pallaton exceeds the height of the cone feed quality and regrowth potential will begin to decline.

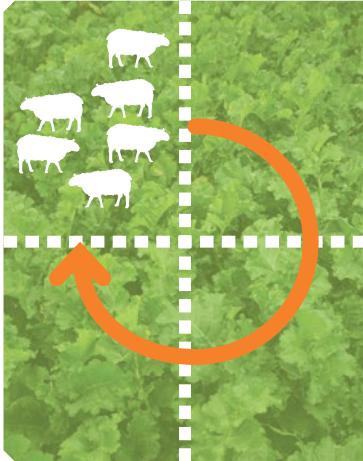


TIPS

- ❗ If you don't have lambs on hand when Pallaton is ready to graze, consider another stock class such as ewes. Ewes will help 'open up' the crop which can be very beneficial for introducing lambs to the crop afterwards.
- ❗ If you are unable to graze early, not all is lost. It may mean you can carry a higher yield forward to a period when you require the feed. However, adjust your expectations and understand your regrowth potential, crop utilisation and/or feed quality may be compromised.

- ❗ Stocking rate is very important to get right. Understocking will result in poor crop utilisation and risk of losing forage quality, while overstocking may see you run short of feed.
- ❗ A grazing withholding period of 42 days after sowing (DAS) (56 DAS for Australia) applies to Pallaton due to the UltraStrike® seed treatment.

GRAZING SYSTEM FOR LAMBS



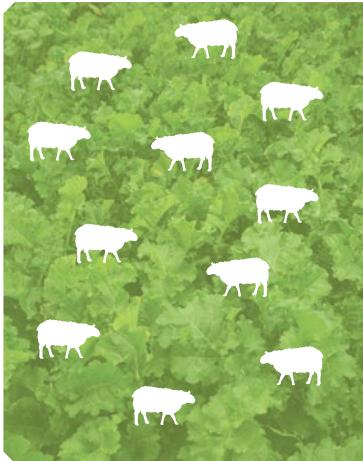
1

ROTATIONAL GRAZING

Take advantage of Pallaton's regrowth ability by setting up a rotation - this is the best way to achieve the highest number of grazings over a season.

Divide the total area of crop into blocks (for instance, 4 blocks) and use a rotation length of 28-40 days, depending on your area and climatic conditions*.

**Pallaton growth rates will vary depending on environmental conditions*



2

SET STOCKING

If it is not practical to subdivide Pallaton paddocks for rotational grazing, lambs can be set stocked on the crop for a fixed period of time.

Take a yield assessment prior to grazing to calculate the stocking rate to ensure the right number of lambs for the required time#.

#Consult your local field representative for guidance on calculating stocking rate.

LAMB PERFORMANCE ON PALLATON RAPHNO

Pallaton is all about more feed for lambs:

- ✓ More dry matter yield from extra re-growth (28.6% and 48% higher yielding than Titan and Pasja II respectively, over three cumulative harvests (*Dumbleton et al., 2021*))
- ✓ Better tolerance to many insect pests
- ✓ Excellent water use efficiency (compared to forage rape and leafy turnips)

As well as extra dry matter grown, well managed Pallaton provides lambs with high-quality feed that contains similar amounts of energy, protein, fibre and minerals as found in other forage brassicas.

PALLATON AND LAMB LIVEWEIGHT GAIN

Liveweight gains by lambs eating Pallaton are typically similar to lambs that eat other brassica species.

Within all types of finishing systems there can be factors that may affect lamb liveweight performance. Some of these we can control, whilst others are environmental and will depend on the season.



PALLATON RAPHNO® FARM SYSTEMS RESEARCH

Investigating the effect of **Pallaton Raphno®** and other finishing diets on liveweight gain, meat quality and fat characteristics in lambs.



LAMB GRAZING STUDY

PGG Wrightson Seeds Forage Agronomist Holly Phillips has completed two replicated farmlet trials for her PhD at Massey University, investigating the effect of finishing diet on liveweight gain, meat quality and fat characteristics in lambs. The second trial near Palmerston North ran from January to May 2020 and compared the forage yields, stocking rates and red meat yield per hectare (ha) associated with three forage types: Pallaton Raphno®, Puna II chicory and perennial ryegrass/white clover pasture.

In summer and autumn 2020, the Manawatu region had very dry conditions with 30% lower rainfall than the 10-year average. For the second year in a row, Pallaton proved impressive with its drought tolerance and persistence, enabling a higher stocking rate of lambs per grazing (Figure 1) and producing more feed into the late summer months compared to the other forages.

Carcass weight gained was used to determine the farm system benefits of the three forages studied. Liveweight can prove misleading,

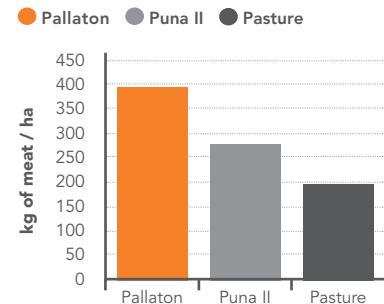
as it is affected by forage type and time off feed, whereas carcass weight provides a more complete picture. The total carcass weight gained on Pallaton was 390 kg/ha over the trial period, compared to 276 kg/ha on chicory and 195 kg/ha on pasture (Figure 2). Overall, Pallaton produced 41% more carcass weight per ha compared to chicory, and 100% more than on pasture.

FIGURE 1:
LAMB STOCKING RATES ON FORAGES (LAMBS/HA)

	MID SUMMER Day 1 – 34 17.01.20 – 20.02.20	LATE SUMMER Day 35 – 68 21.02.20 – 25.03.20	AUTUMN Day 69 – 105 26.03.20 – 01.05.20
	 50 →	 32 →	 35 →
Pasture	 32 →	 19 →	 18 →
	 35 →	 15 →	

Lamb stocking rates on the forages through mid-summer, late summer and autumn

FIGURE 2:
CARCASS WEIGHT GAINED



Net carcass weight gained on Pallaton Raphno®, Puna II chicory and perennial ryegrass/white clover pasture over the trial period.



CATTLE GRAZING FOCUS

For the best opportunity to maximise feed quality, increase crop utilisation by cattle and optimise regrowth potential of Pallaton Raphno®, follow these cattle grazing guidelines.

PALLATON RAPHNO® GRAZING INDICATOR FOR CATTLE

To optimise the multi-graze capabilities of Pallaton Raphno®, we recommend using the grazing indicator road cone to help with cattle grazing management decisions.



1

PLANT, WAIT AND WATCH

Identify a position for your Pallaton cone in an average area of paddock.

Think about what stock classes you have available and how you will transition cattle onto Pallaton.



2

GRAZE!

Once Pallaton reaches the reflective strip on the cone get in and graze.

Make sure cattle are full of another feed type at first grazing.

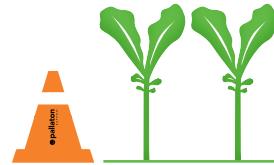
Note: It must be at least 42 days since planting before grazing can commence.



3

YOU ARE MISSING OUT

As Pallaton gets taller and appears more like kale, heavier stems reduce feed quality, crop utilisation and overall stock performance.

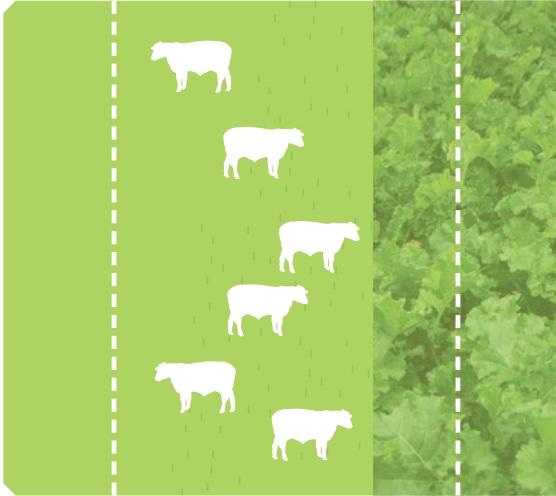


TIPS

- ❗ A grazing withholding period of 42 days after sowing (DAS) (56 DAS for Australia) applies to Pallaton due to the Ultrastrike® seed treatment.
- ❗ Dry dairy cows, dairy heifers and beef cattle should be limited to 80% of Pallaton in their diet. Feed no more than 35% of the diet as Pallaton for lactating dairy cows. Use a high fibre supplementary feed such as baleage, hay, silage and/or pasture for a balanced diet.

- ❗ Post-grazing residuals below 10 cm can reduce the regrowth potential of the Pallaton crop.
- ❗ Do not feed Pallaton as a complete diet. Cattle will require a high fibre supplementary feed.

GRAZING SYSTEM FOR CATTLE



STRIP GRAZING

Strip grazing is necessary for cattle grazing Pallaton with daily or every second day break shifts.

Set stocking or grazing large blocks of Pallaton with weekly shifts for instance, is not recommended for cattle.

Back fencing and taking care to not overgraze Pallaton is essential if crop regrowth is required. Avoid post-grazing residuals below 10 cm, as this will compromise regrowth potential. Prior to grazing, it is important to assess the dry matter yield of the crop, while also accounting for ongoing growth of Pallaton 'underfoot' and in front of cattle to help with feed allocation.

TIPS

- 1 When transitioning from pasture onto brassica crops, cattle are most at risk of bloat and rumen acidosis. Therefore, it is important to manage a gradual transition onto crop and to monitor animal health.
- 1 Crop-fed cattle must have access to fresh water at all times. The use of portable troughs that move with the crop face work best. When back fencing ensure cattle are able to easily access the fresh water.
- 1 Double fence the Pallaton crop face and check voltage of electric fences to prevent breakouts.



CROP MANAGEMENT

Autumn presents an opportunity to review the performance of your **Pallaton Raphno®** and assess the ability of the crop to continue into winter.

WINTER GRAZING OPPORTUNITY

Under optimum grazing and climatic conditions, farmers may have the opportunity to continue growing their Pallaton crop into winter for a final grazing. Assess your Pallaton crop in early autumn for the following factors to help with your decision to carry the crop through:

Plant Numbers

After the March grazing, take the opportunity to do some plant counts in your Pallaton crop. Using a square metre (1 m²) hoop, randomly sample the paddock to get an average plant count per 1 m². Carrying your Pallaton crop into winter will largely depend on the number of plants present in the autumn to set the crop up for winter grazing.

Crop Health

Excessively wet or fluctuating wet and dry conditions coupled with multiple grazings can create an opportunity for brassica bacterial and fungal disease infection. This is not unique to Pallaton and is a risk for all brassica crops. If you think there may be brassica disease in the crop, it is recommended to sow break crops such as pasture.

AUTUMN PLANT COUNTS

The average plant numbers present in early autumn will help determine what the best option will be for your Pallaton crop.

less than **10** plants/m²

SPRAY OUT AND RESOW

Plant numbers are inadequate to provide sufficient winter feed. Target a hard/low residual graze with animals to minimise crop residue carryover. Consider total spray out of paddock and planting back into pasture.

10-15 plants/m²

UNDERSOW WITH WINTER-ACTIVE GRASSES

Increase the opportunity for extra winter feed by undersowing with a winter-active ryegrass in the autumn. Options include Italian ryegrasses such as Supercruise, Lush AR37 and Feast® II, Winter Star II annual ryegrass or oats.

more than **15** plants/m²

CARRY THROUGH FOR WINTER GRAZE

Consider carrying the crop through to winter as a sole sward if weed burden is low and soil fertility is adequate. Shut the paddock up by early April and apply nitrogen accordingly to boost overall dry matter yield for winter.







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The PGG Wrightson Seeds logo, featuring a stylized green and white wave above the text "PGG Wrightson Seeds" in a bold, sans-serif font. "PGG" is in white, "Wrightson" is in white, and "Seeds" is in green.

PGG Wrightson Seeds