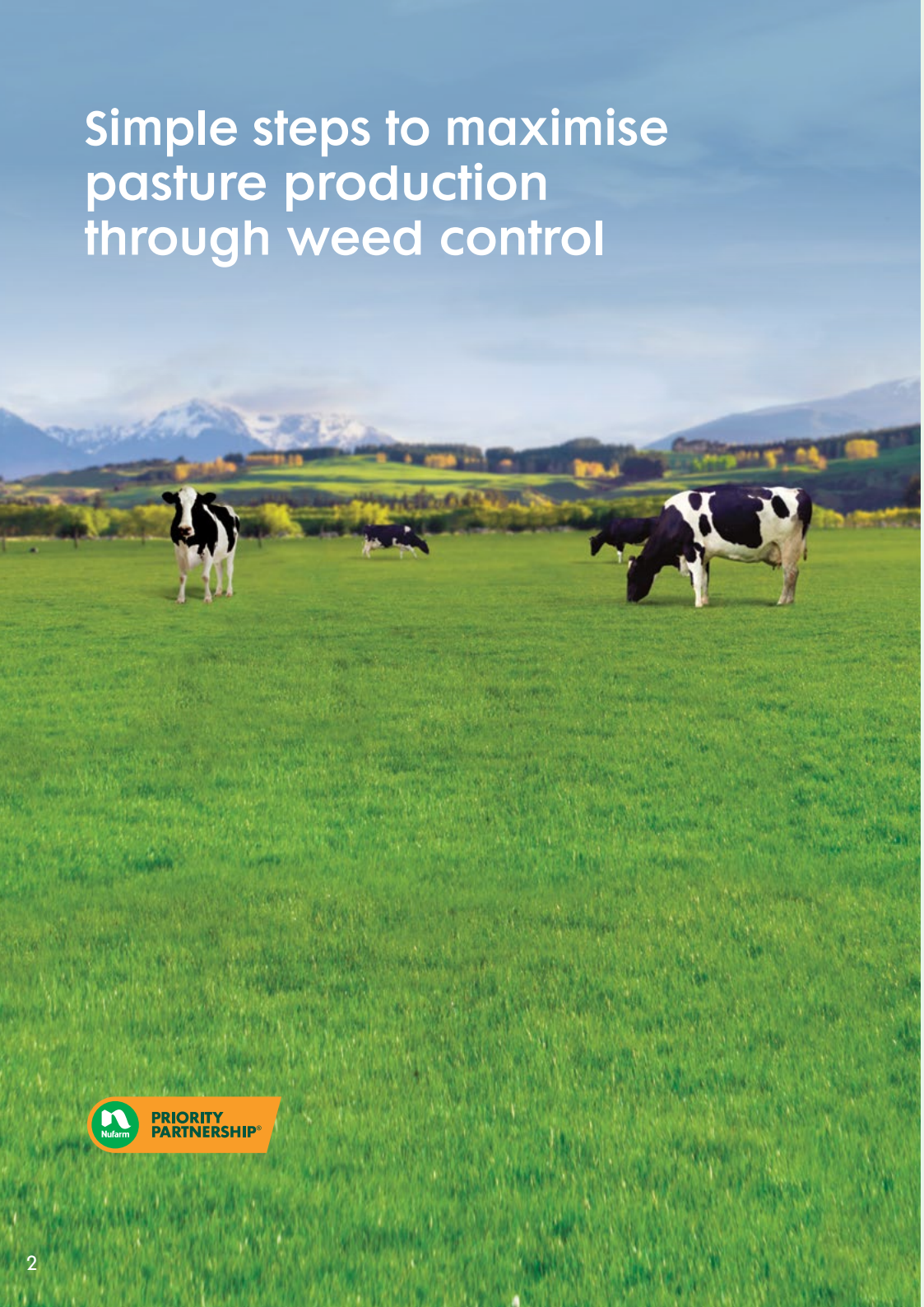
# ESTABLISHED PASTURE WEED MANAGEMENT

A Weed Control Guide

Nufarm

Grow a better tomorrow

# Simple steps to maximise pasture production through weed control



PRIORITY PARTNERSHIP®



# Introduction to weed control in pasture

Pastures are able to be utilised all year round and in many situations. They deserve to be treated like a specialist crop on farm due to their high dry matter (DM) yield potential and ability to be grazed multiple times within a growing season.

Since pastures do not need to be renewed annually, weed control is important for them to maintain their productivity for extended periods.

Pastures have three main timings for weed control; pasture establishment, winter, and spring.

The various timings represent the best time to control weeds after they germinate. Controlling weeds at establishment of a new pasture sets the paddock up for success, ensuring that plant population is high from the beginning.

Winter weed control timing is for weeds which germinate in autumn and is when clover is least active. This timing minimises clover damage and controls autumn germinating weeds while they are small.

The spring weed control timing is for weeds that germinate in the spring. This targets control before the weeds get too large and flower, making them very difficult to kill.

For the purpose of this booklet, only winter and spring weed control will be discussed.

# Winter weed control

A late autumn/early winter spray can be an ideal component in a programme on many farms for a variety of reasons. Problem weeds like buttercup, ragwort and thistles, germinate in autumn.

Phenoxy herbicide applications are most effective and economic while weeds are still small and actively growing. At this time clover is generally less actively growing and less likely to be damaged by herbicides. Controlling these weeds allows for improved pasture production/utilisation, which in turn can increase farm productivity as more quality dry matter is available during the late winter, spring and summer periods. Nufarm's phenoxy herbicide package often forms the basis of broadleaf winter weed control in established pastures.


## AGRITONE® 750

A selective herbicide for the control of many broadleaf weeds in established pastures, grass playing fields, lawns, and in cereals, grass seed and linseed crops.


## BATON® 800WSG

Baton 800WSG is a non-volatile 2,4-D formulation herbicide for broadleaf weed control in cereals and pasture.


## RELAY® SUPER S

A selective herbicide for broadleaf weed control in pasture and turf.


## SPRINTER® 700DS

A non-volatile 2,4-D liquid in the form of a soluble concentrate for broadleaf weed control in pasture and cereals.





As weeds get bigger, they become more difficult to control and require higher product rates and/or the addition of a spike herbicide, such as Archer® 750 or Conquest® to maintain the efficacy.


## ARCHER 750

Archer 750 is a herbicide for the control of certain broadleaf weeds in a wide range of crops. It can be tank mixed with Baton 800WSG, Relay Super S, Sprinter 700DS and Agritone 750 to control large or hard to kill thistles with phenoxy resistance.


## CONQUEST

Conquest is a herbicide which can be used to improve the control of larger weeds especially ragwort.

## Checklist for successful control

The following are a few key tips when applying these herbicides in established pastures to help you achieve the best possible results:

- Make sure to check with your local council regarding regulations for phenoxy herbicide applications
- Spray prior to weeds becoming too large e.g. form large rosettes or flower
- Graze prior to spraying to expose weeds and reduce clover leaf area; allow 3–7 days for the weeds to freshen and then spray
- Weeds need to have exposed, recent leaf to be able to uptake herbicides
- Don't spray weeds under stress (frost, drought, water logging)
- Delay application if rain is likely within 2 hours of using Agritone 750 or Relay Super S or 6 hours when using Baton 800WSG or Sprinter 700DS.

## Thistle and ragwort control

Thistles and ragwort are best controlled soon after germination. For most thistle species this is in winter using herbicides containing MCPA or 2,4-D as the active ingredient. 2,4-D herbicides should be used to control ragwort. The addition of a spike herbicide is essential to control weeds once they form large rosettes or are multicrowned. Thistles are annual or biennial.

## Nodding thistle

Nodding, winged and variegated thistles are annuals. They germinate in autumn, and if not controlled, will set seed in the summer following germination. The best control timing of these thistles is winter.

## Scotch thistle

Scotch thistles are biennial and germinate in spring. In their first summer they tend to remain as a rosette then flower in their second summer. The best time to control scotch thistle is in spring.

## Ragwort

Ragwort can exhibit biennial and perennial tendencies. It grows year round and can flower multiple times before dying. It is best controlled when the plant is small and vegetative. Topping ragwort will not assist in control. In fact, it will likely produce multicrowned plants making control with herbicides more difficult. Ragwort is poisonous to stock. Sprayed plants must be allowed to die off completely before grazing.





# Winter weed control

## Application rates and timing

| WEED | COMMENT | APPLICATION RATE MAIN PRODUCT | | | | APPLICATION RATE SPIKE PRODUCT | |
|---|---|---|---|---|---|---|---|
| | | AGRITONE 750 | RELAY SUPER S | BATON 800WSG | SPRINTER 700DS | ARCHER 750 | CONQUEST |
| Nodding thistle | Seedlings to small rosettes (root crown less than 2cm) | 1.5–2L/ha | 1.5L/ha | 2kg/ha | 2.3L/ha | | |
| | Rosettes: root crown 2–4cm diameter, prior to flower stalk development | 2–3L/ha | 2–2.3L/ha | 2.5–3.5kg/ha | 2.8–3.4L/ha | 40mL/ha | 250–500ml/ha |
| Ragwort | Seedlings to small rosettes (root crown less than 2cm) | | 2L/ha | 2kg/ha | 2.3L/ha | | |
| | Rosettes: root crown 2–4cm diameter, prior to flower stalk development | | 3L/ha | 2.5–3kg/ha | 2.8–3.4L/ha | | 250–500ml/ha |
| Scotch thistle | Seedlings and rosettes: apply low rate for seedlings | 1.5–2L/ha | 0.75–1.5L/ha | 1–2kg/ha | 1.2–2.3 L/h | | |
| Variegated thistle | Seedlings only | 1.5L/ha | 1.5L/ha | 1.5–2kg/ha | 1.8–2.3L/ha | | |
| | Rosettes: prior to flower stalk development | 2–3L/ha | 2–2.3L/ha | 2–3kg/ha | 2.3–3.4L/ha | 40mL/ha | 250–500ml/ha |
| Winged thistle | Seedlings only | 1.5L/ha | 1.5L/ha | 2kg/ha | 2.3L/ha | | |
| | Rosettes: prior to flower stalk development | 2–3L/ha | 2–2.3L/ha | 2.5–3kg/ha | 2.8L/ha | 40mL/ha | 250–500ml/ha |

All weeds listed have primary germination in autumn and recommended application is in winter, except for Scotch thistle which germinates in spring and must be treated immediately, in spring.

# Californian thistle control

## Californian thistle

Californian thistles reproduce from an extensive creeping horizontal root system. In spring, shoots develop along the underground roots. The first shoots grow strongly, supported by a large root system with minimal competition for nutrients and light. They supply nutrients to the root system during summer and die in late autumn, but leave a new generation of over-wintering roots to continue the cycle. This cycle allows Californian thistle to spread rapidly within paddocks. Distributing fragments of roots containing buds, either via livestock or cultivation, also contributes to the spread.

## Checklist for successful control

- There is no "one-shot" magic bullet for effective control
- Multiple applications of selective herbicides, e.g. Baton 800WSG or Thistrol Plus, each year for at least 2 years is generally required
- To control root formation, remove above ground thistle growth multiple times between November and April
- Renew old pastures using the Programmed Approach™ over a 12–15 month period with three applications of CRUCIAL® and two intermediate crops.

## Control strategies

The mow and spray option is the preferred option. When mowing is not an option, a herbicide programme will be the next best solution.

### MOW AND SPRAY

- Mow when 20–30% of shoots reach the hardball stage (Nov)
- Boom spray re-growth in January with appropriate herbicide
- Spray again in March to kill newly-emerged shoots
- Repeat for the next 1–2 years until thistles are controlled.

### 2X2™ SPRAY PLAN

- Apply appropriate herbicide via boom spray or weed wiper when thistle shoots are at the early flower bud stage (Dec – mid Jan)
- Apply herbicide again in March to kill newly-emerged shoots. Failure to apply this second treatment is the main reason for poor control of Californian thistle.
- Repeat for the next 1–2 years.





## Why the 2x2 Spray Plan works

The biology of Californian thistles means that repeated treatment is needed to diminish thistle numbers. Figure 1 shows that in the first year of treatment one spray reduced thistle numbers by 36% and two sprays by 73%. Whereas, Figure 2 shows that a further two sprays the following growing season reduced thistle numbers by 93%. In summary, two sprays for two growing seasons is one of the most effective methods for controlling Californian thistles.

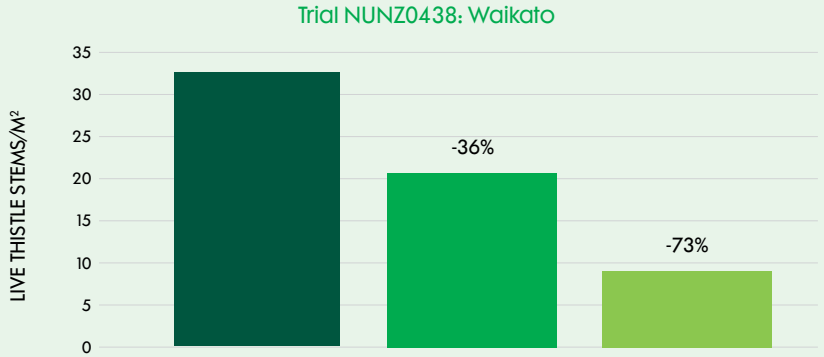



Figure 1: Thistle numbers in the spring following treatment the previous year

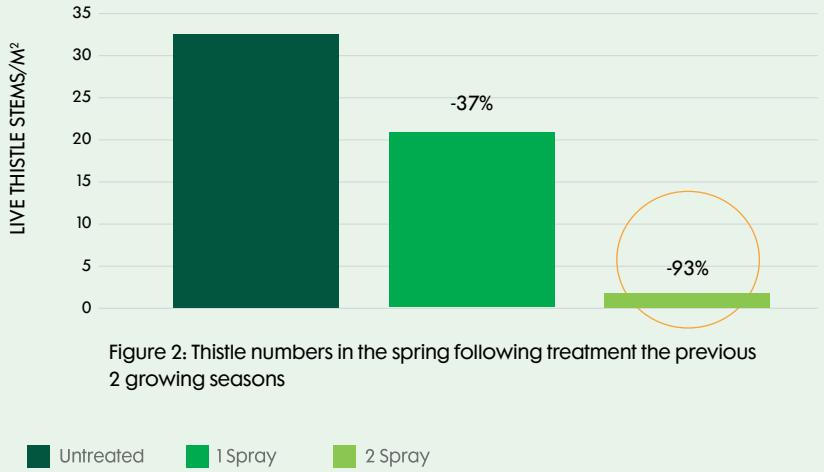



Figure 2: Thistle numbers in the spring following treatment the previous 2 growing seasons

# Spring weed control

Controlling weeds in spring is a crucial timing to ensure that they do not reach a reproductive phase.

Many weeds germinate in spring as soil temperature warms up and any area with no established pasture is at risk of being filled by weeds. Spring weed control targets weeds while they are small. In many cases, once weeds can be seen within the pasture, they have often developed reproductively and can be impossible to control selectively.


## BATON 800WSG

Advanced formulation phenoxy herbicide, containing 800g/kg 2, 4-D as the dimethylamine salt. Baton 800WSG is low odour, non-volatile and causes less damage to clovers.


## DICTATE® 480

Dictate 480 is a selective contact herbicide which must be applied in sufficient water to ensure that all parts of the target weeds are thoroughly covered. Best used during warm conditions when the weeds are at the 4–6 leaf stage.


## DOCKSTAR®

A selective systemic herbicide that controls docks. Best control is achieved when used in spring as soon as docks break dormancy and develop leaves.


## THISTROL® PLUS

Combines MCPA and MCPB giving flexibility to use over a wide range of situations. Controls seedling broadleaf weeds in established pasture. Suitable to use prior to your first graze in new pasture. Excellent clover safety.






## TRIBAL® GOLD

Unique co-formulation of MCPA, MCPB and Flumetsulam developed specifically for NZ pastoral farmers. Controls a wide spectrum of broadleaf weeds including buttercups, twin cress, black nightshade, chickweed, hedge mustard, thistles, stinking mayweed and storksbill. Clover and grass friendly. Always apply in conjunction with Bonza® Gold.


## VALDO® 800WG

Clover friendly herbicide for control of buttercups, cresses and oxeye daisy, ideal as a tank mix partner for Baton 800WSG. Always apply in conjunction with Bonza Gold.

## Checklist for successful control

- Control spring germinating weeds before they begin reproductive growth
- Identify weeds early and select the correct product and rate to control the weed
- Weeds need to have exposed, recent leaf to be able to uptake herbicides
- Don't spray weeds under stress (frost, drought, water logging)
- Maintain pasture plant population where it has been damaged to minimise the ability for weeds to germinate next spring
- Delay application if rain is likely within the rainfast period of products.

Dock can be controlled using Dockstar alone or in combination with Baton 800WSG

# Spring weed control

## Buttercup

Most common in dairy pastures, particularly on less free draining soil types. Creeping and giant buttercup can be particularly invasive and are not easy to control.

## Fleabane

Prolific and fast growing, it prefers light soils and can withstand dry conditions. Fleabane produces a large number of seeds which can germinate in both spring and autumn.

## Dandelion

A common problem in pasture. Effective control is only possible during the seedling stage because the plant is both deep rooted and perennial. Note: once sprayed, dandelion plants can take several weeks to die.

## Dock

A perennial weed with a deep and large tap root that can be multicrowned. Docks can be a problem weed in wet paddocks. Once sprayed, docks can take several weeks to die.

## Fathen

An extremely fast-growing weed with excellent survival mechanisms. In good conditions it can grow up to 1m high before flowering, but in dry situations it will flower and produce seed before it is 4cm high. It has a very thick waxy layer which coats the leaves in dry weather, preventing absorption of herbicides.





## Hedge mustard

A tap-rooted annual, hedge mustard (often mistakenly called wireweed) can be a problem in newly-sown or open pastures. Seedlings form rosettes, producing flowering stems over 1m high. Stock avoid this plant, leading to poor pasture utilisation.

## Oxeye daisy

A perennial weed that becomes more prominent in spring. Often found in open pastures and on sidelings. A difficult weed to control.

## Pennyroyal

Invasive and highly unpalatable to stock, pennyroyal forms dense mats of vegetation in pastures, causing inefficient feed utilisation, and taints the milk of lactating dairy cows if they do eat it.

## Wild Turnip

Fast-growing and persistent, wild turnip is an annual brassica which is common in pastures on a wide range of soils. Flowering stalks can reach 1m high causing loss of pasture yield through competition for resources. Once the plant matures, its root reserves make it harder to control.

## Willow weed

Highly invasive, it can smother large areas of both newly-sown and established pastures. It is generally unpalatable to stock, but can be fatal if consumed. Willow weed produces a large volume of seeds which remain viable for some time, and it can also reproduce from small pieces of broken stem.

# Spring weed control

## Application rates and timing

| PRODUCT | RATE | WEED | NOTES |
|---|---|---|---|
| Baton 800WSG | 1–1.5kg/ha | Annual buttercups | Apply before flowering. Controls annual species only |
| | 1–2kg/ha | Fathen | Apply before flowering |
| | | Hedge mustard | Seedlings to small rosettes |
| | 1.5–2.5kg/ha | Wild radish | Seedlings only. Established plants are not well controlled |
| | | Fleabane, dandelion, cresses | Seedlings to small rosettes |
| | | Pennyroyal | Prior to flower stalk growth. High rate useful as a salvage treatment for flowering pennyroyal |
| | | Wild turnip | Seedlings only. Established plants are not well controlled |
| | 2–2.5kg/ha | Dock | 2–4 leaf seedlings only |
| | 2–3kg/ha | Ragwort | Apply before flowering. Baton 800WSG controls annual species only |
| | | Willow weed | Seedlings less than 75mm tall. Willow weed is commonly mistaken for water pepper, (lighter green leaves and no black markings). Baton 800WSG won't control water pepper. |
| Dictate 480 | 750ml–1L/ha in 250L water. 1–5 days after MCPA treatment | Pasture (grass or mixed swards with clover and/or plantain) infested with giant buttercup | Weeds at rosette to just before flower stalk elongation. End-August to mid-September in most regions. Remove grazing stock and allow pasture to freshen up (approx 5–10 days). Apply Agritone® 750 at 2L/ha, then apply Dictate 480 1–5 days later. Re-treatment in following seasons will be required to deplete seed bank in the soil. Dictate 480 will control giant buttercup that is resistant to MCPA. |
| Dockstar | 3.1–4.1L/ha in 200L water/ha | Docks | Apply in early spring when docks are actively growing and in full leaf. Avoid spraying after seed heads have emerged.<br>High rate for heavy infestations of mature docks. May cause temporary yellowing of some pasture species. To minimise check to growth leave pasture for at least 2–3 weeks after grazing, before spraying. Do NOT apply to grass seed crops. "Not suitable for use on brome, browntop or prairie grass based pasture". |

| PRODUCT | RATE | WEED | NOTES |
|---|---|---|---|
| Thistrol Plus | 3–4L/ha | Annual buttercup, fathen, Scotch thistle | Treat any growth stage before flowering |
| | | Black nightshade, redroot, twin cress, giant buttercup | Controlled as seedlings. Useful suppression of older stages |
| | 4L/ha | Thistles: nodding, winged, variegated | Controlled as seedlings. Useful suppression of older stages |
| | | Californian thistle | Treat at flower bud stage before flowers open |
| | | Docks, hedge mustard, wild turnip, plantain, willow weed | Controlled only as seedlings |
| Tribal Gold | 4L/ha | Chickweed, cleavers, fathen, fleabane, hedge mustard, mallow, plantain, redroot, shepherd's purse, spurrey, wild radish | Controlled as seedlings |
| | | Annual buttercup, creeping yellow cress, Scotch thistle, yellow gromwell | Apply before flowering |
| | 4–5L/ha | Black nightshade, giant buttercup, twin cress | Controlled as seedlings. Useful suppression of older stages |
| | 5L/ha | Thistles: nodding, winged, variegated | Controlled as seedlings. Useful suppression of older stages |
| | | Californian thistle | Treat at flower bud stage before flowers open |
| | | Cornbind, docks, sorrel, sow thistle, stinking mayweed, wild turnip, willow weed, wire weed | Controlled only as seedlings |
| | | Field pansy, henbit, oxeye daisy | Apply to young seedlings, suppression only |

# Spring weed control

## Application rates and timing

| PRODUCT | RATE | WEED | NOTES |
|---|---|---|---|
| Valdo 800WG | 30–65g/ha | Hedge mustard | Seedlings to small rosettes |
| | | Wild radish | Seedlings only. Established plants are not well controlled |
| | 50–65g/ha | Annual buttercups | Apply before flowering |
| | | Cresses | Seedlings to small rosettes |
| | 65g/ha | Giant buttercup | Apply before flowering |
| | | Oxeye daisy | Apply to young seedlings. Suppression only |
| | | Willow weed | Seedlings no taller than 75mm. Willow weed is commonly mistaken for water pepper, (lighter green leaves and no black markings). |

Fathen can be controlled as a seedling by Tribal Gold or before flowering by Baton 800WSG.





# Spring weed tank-mix options

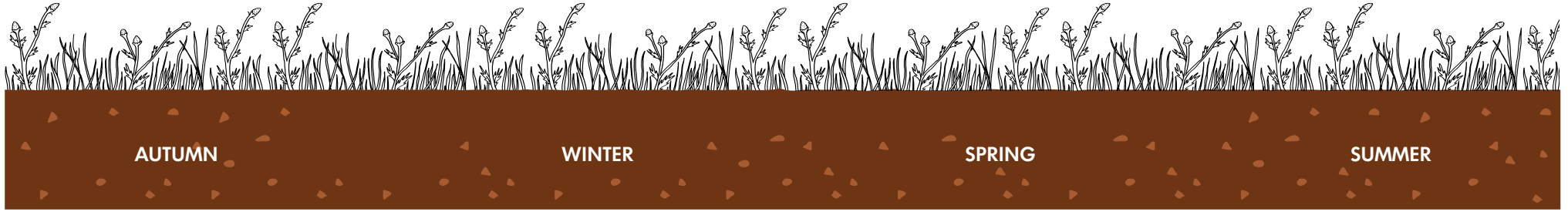
| PRODUCT COMBINATION | WEEDS | NOTES |
|---|---|---|
| Dockstar and Baton 800WSG<br>2L/ha Dockstar + 2kg/ha Baton 800WSG in 150–200L water/ha | Docks, ragwort, willow weed, wild radish, fleabane, cresses, dandelion, pennyroyal, wild turnip, fathen, hedge mustard, buttercups | Single application in early spring only, when docks are actively growing and in full leaf.<br>Some temporary pasture yellowing and growth suppression may occur. To minimise any check to growth leave pasture for at least 2–3 weeks after grazing before spraying. Avoid spraying after seed heads have emerged.<br>After spraying with Baton 800WSG or Sprinter 700DS, poisonous plants (eg. ragwort) may become more palatable. To maximise control of mature docks and prevent harm to stock avoid grazing for 1–2 weeks after spraying. |
| Dockstar and Sprinter 700DS<br>2L/ha Dockstar + 2.3L/ha Sprinter 700DS | | |
| Baton 800WSG, Valdo 800WG and Bonza Gold mix<br>30–65g/ha Valdo 800WG + 1–2kg/ha Baton 800WSG + 500ml/100L Bonza Gold | Creeping yellow cress, oxeye daisy, buttercups, willow weed | Apply when weeds are actively growing and prior to seed head development.<br>Anything above 2kg/ha will be devastating on the clovers due to the Bonza Gold in the mix. |

# Pasture lifecycle

Continual use of the same mode of action products can result in resistance development in weed populations.

Where possible it is important to rotate modes of action herbicides. To aid in this, the modes of action for the herbicides are presented next to the product in green circles.

| AUTUMN | WINTER | SPRING | SUMMER |
|---|---|---|---|
| Relay SUPER S | 4 | | |
| Baton 800WSG 4 | | Baton 800WSG 4 | |
| sprinter 700 DS 4 | | sprinter 700 DS 4 | |
| Nufarm Agritone 750 | | 4 | |
| ARCHER 750 DUAL SALT | | | 4 |
| Nufarm Conquest | | | 4 |
| Nufarm VALDO 800WG 2 | | Nufarm VALDO 800WG | 2 |
| THISTROL PLUS 4 | | THISTROL PLUS | 4 |
| Nufarm TRIBAL GOLD 2 4 | | Nufarm TRIBAL GOLD | 2 4 |
| Nufarm DICTATE 480 6 | | Nufarm DICTATE 480 | 6 |
| Nufarm DOCKSTAR 18 | | Nufarm DOCKSTAR | 18 |








Pasture lifecycle

# Working out what you need

| PRODUCT | APPLICATION RATE PER HA* | TOTAL HA'S REQUIRED | AMOUNT REQUIRED |
|---|---|---|---|
| Agritone 750 | 1.5–3L/ha | | |
| Archer 750 | 40ml/ha | | |
| Baton 800WSG | 1–3kg/ha | | |
| Conquest | 250–500ml/ha | | |
| Dictate 480 | 3L/ha | | |
| Dockstar | 3.1–4.1L/ha | | |
| Relay Super S | 1.5–3L/ha | | |
| Sprinter 700DS | 1.8–3.6L/ha | | |
| Thistrol Plus | 3–4L/ha | | |
| Tribal Gold | 4–5L/ha | | |
| Valdo 800WG | 30–65g/ha | | |





# Grassmanship

Nufarm have developed a tool to calculate the benefit controlling weeds can have on pasture production and ultimately farm production and profit.

Weeds can severely impact pasture, reducing the effective production and consumption of a paddock. The Grassmanship app allows you to generate more profit from your pasture, minimise supplementary feed costs and maximise your home-grown feed.

For more information about the benefit that you can have from weed control in your pasture, visit grassmanship.nz or scan the QR code below.

## Notes:



## Notes:

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