

SUBMISSION ON

Call for Information on Oxadiazon

19 November 2024

To: Reassessments Team, Environmental Protection Authority

Name of Submitter: Horticulture New Zealand

In partnership with:

Onions New Zealand

New Zealand Blackcurrants

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OVERVIEW

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Our submission

Horticulture New Zealand (HortNZ) thanks the Environmental Protection Authority for the opportunity to submit information about the use of oxadiazon in the horticulture industries. We welcome any opportunity to continue to work with the EPA and to discuss this and other crop protection matters.

HortNZ's Role

Background to HortNZ

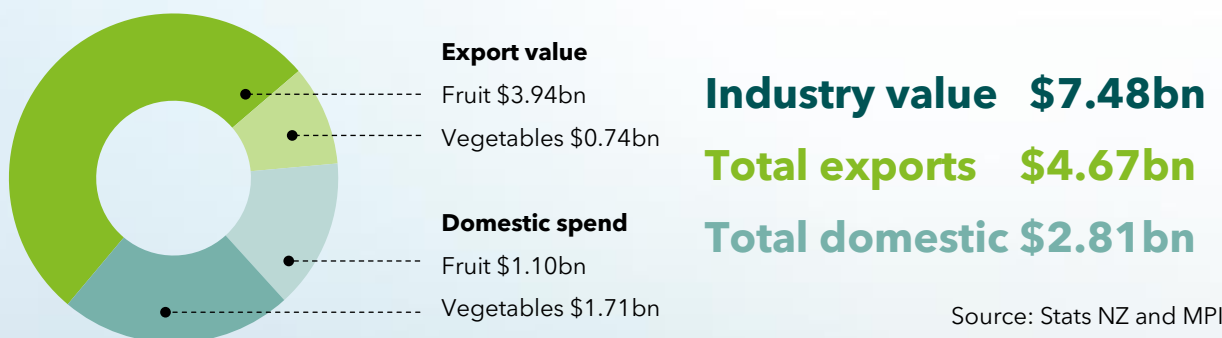
HortNZ represents the interests of approximately 4,200 commercial fruit and vegetable growers in New Zealand who grow around 100 different fruits and vegetables. The horticultural sector provides over 40,000 jobs.

There are approximately 80,000 hectares of land in New Zealand producing fruit and vegetables for domestic consumers and supplying our global trading partners with high quality food.

It is not just the direct economic benefits associated with horticultural production that are important. Horticulture production provides a platform for long term prosperity for communities, supports the growth of knowledge-intensive agri-tech and suppliers along the supply chain; and plays a key role in helping to achieve New Zealand's climate change objectives.

The horticulture sector plays an important role in food security for New Zealanders. Over 80% of vegetables grown are for the domestic market and many varieties of fruits are grown to serve the domestic market.

HortNZ's purpose is to create an enduring environment where growers prosper. This is done through enabling, promoting and advocating for growers in New Zealand.



HortNZ's involvement with crop protection regulation

On behalf of its grower members HortNZ works to help ensure that the regulatory settings and services that affect the availability and affordability of crop protection products in New Zealand are appropriate, workable, and cost-effective.

Executive Summary

Horticulture New Zealand (HortNZ), in partnership with Onions New Zealand and New Zealand Blackcurrants, appreciates the opportunity to provide information on oxadiazon use within the horticulture industry. This submission discusses the use of oxadiazon in onions and blackcurrants, the effective mitigation measures to protect human health and the environment, and an assessment of potential alternatives if oxadiazon were to become unavailable.

Oxadiazon-containing products (Foresite, Exadia and Oracle) are important in New Zealand's onion and blackcurrant sectors for effective weed control. The products are used selectively, with only one application during the establishment of blackcurrant cuttings and two applications per season in onions. While the horticultural industry's use of oxadiazon is limited, it remains important due to its broad-spectrum efficacy, longer residual activity, and low need for repeat applications or in combination with other herbicides, which collectively reduce environmental impacts and labour demands.

Both sectors have effective, long-standing mitigation measures to limit environmental and human exposure to oxadiazon. Applications are close to the soil using tractor-mounted equipment or boom sprayers, conducted only when the wind conditions are suitable to minimize drift (1-3 m/s, ~ 3.6 - 10.8 km/h). Trained applicators with professional certification perform the applications from sealed, air-filtered tractor cabs, protecting them from exposure. Additionally, growers maintain NZGAP accreditation, which involves annual audits of storage, competency, and safety practices.

If oxadiazon were no longer available, New Zealand's agricultural sector—particularly onion and blackcurrant growers—would face challenges, including increased weed pressure, higher costs, reduced environmental sustainability, and potential compliance issues in export markets. Products, such as pendimethalin and oxyfluorfen, are either less effective or require more frequent and other herbicide applications, raising operational costs and environmental impacts. There is a significant list of weeds of onion growth that oxadiazon control cannot be treated with other available herbicides that registered for use in New Zealand.

Submission

1. The Use of Oxadiazon in Horticulture Sectors

Oxadiazon-containing products are primarily used in two horticulture sectors: onions, blackcurrants and some allium like garlic. In blackcurrants, Foresite or Exadia is applied once during the establishment year, while in onions, Exadia or Oracle is applied twice per season, with applications spaced 21 days apart. Further details on application rates and methods are in Appendix 1.

1.1. Please list the oxadiazon-containing products that you use. Provide the product name and HSNO approval number (for example, HSR000XXX) if known.

The oxadiazon-containing products that being used in horticulture sectors are Foresite (HSR 000541), Exadia (HSR101180), and Oracle (HSR100445).

1.2. To which crops or application scenarios do you apply the product(s) (for example, onions, pipfruit, lawn maintenance) and for what purpose? Are any of these uses off-label?

There is no off-label use. Foresite or Exadia are currently used in blackcurrants as pre-emergent herbicide at one application on planting for life (i.e., just establishment year). Exadia or Oracle are used in onions as post emergence herbicide for a number of weeds.

1.3. How do you apply the product(s)? Provide details such as:

- application rate and application method (such as backpack sprayer, tractor)
- concentration of product and volume of water used
- how often you apply it and at what time of the year.

For blackcurrant, either Foresite or Exadia is applied at 4L product per ha (=1.5 kg oxadiazon/ha) on the planting year with tractor-mounted equipment. The concentration of the products is 380g/L. The volume of water used is 600L/ha. The products are applied in august or September over newly planted cuttings in the establishment year only once life of plant.

For onions, either Exadia or Oracle is applied at 2L product per ha (= 0.38g oxadiazon/ha) using boom sprayer. The concentration of the products is 380g/L. There are two

applications per season with 21 days apart. The products are applied around September to December.

1.4. Do you have any other comments on how you use oxadiazon products?

The post-harvest interval for blackcurrants is 500 days, and 60 days for onions.

2. Mitigation Measures and Controls the Sectors are Taking

Both sectors employ robust mitigation measures to protect against environmental and human exposure to oxadiazon-containing products.

2.1. If you apply oxadiazon-containing products, what mitigation measures do you put in place to limit environmental or human exposure?

For applications of oxadiazon-containing products in blackcurrants and onions, the growers use tractor-mounted equipment or boom sprayers, ensuring application is close to the soil and only done when wind speed is within the range of 1-3 m/s (~ 3.6 - 10.8 km/h) (See Appendix 2 for a tool used by the growers to mitigate the drift risk). This practice effectively limits spray drift to the surrounding environment. Only trained and professional applicators handle and mix these products, operating within tractors that have sealed cabs and filtered air systems. This setup provides additional protection, ensuring applicators are not exposed to the products.

2.2. How effective do you think these measures are in managing adverse effects that arise from using oxadiazon-containing products?

We believe these measures are highly effective in managing any adverse effects associated with oxadiazon-containing products, such as Foresite, Exadia, and Oracle. All participating growers are NZGAP-accredited (New Zealand Good Agricultural Practice), which requires annual audits covering storage, competency, and knowledge of environmental and human safety protocols. The longstanding use of these practices with an extremely low incidence of exposure incidents further demonstrates their effectiveness in mitigating risks.

2.3. Do you use any of the following personal protective equipment (PPE) when using oxadiazon products? Expand on your answer in the text box if necessary.

- Gloves
- Coveralls
- Enclosed footwear
- Masks or respirators
- Safety glasses

3. Benefits and Alternatives to Oxadiazon Products

3.1. If you use oxadiazon, why do you choose to use oxadiazon products? What are the benefits and positive effects associated with the use of oxadiazon products?

Oxadiazon is a highly effective broad-spectrum herbicide for both pre-emergent and post-emergent weed control, controls many difficult-to-control weeds like fumitory, oxalis, docks, willow weed, wireweed, etc., making it an important crop protection tool in New Zealand's onion sectors.

3.1.1. HERBICIDE IS IMPORTANT TO ENSURE ONION SECTOR VIABILITY

Onions are relatively slow-growing and susceptible to competition from faster-growing weeds, which can quickly overwhelm the crop. With over 80% of New Zealand's onion production geared for export, compliance with international market standards often limits herbicide options, making oxadiazon particularly valuable to the sector.

3.1.2. BROAD-SPECTRUM WEED CONTROL AVOIDS APPLYING MULTIPLE HERBICIDES

Beyond its effectiveness, oxadiazon offers a broad spectrum of weed control, reducing the need for additional broadleaf and grass herbicides. Although there are many herbicides registered in NZ to control weed in onion growing, there are still a long list of weeds that cannot be controlled without the use of oxadiazon.

The weeds that could not be controlled with other herbicides that registered to be used on onion in New Zealand include Barley Grass, Bittercress, Broad-Leaved Plantain, Browntop, Creeping Buttercup, Crested Dogstail, Cut-Leaved Geranium, Docks, Fathen, Field Speedwell, Giant Buttercup, Green Bristle Grass, Kentucky Bluegrass, Mouse-Ear Chickweed, Narrow-Leaved Plantain, Oxalis Corniculata, Oxalis Latifolia, Oxalis Stricta, Perennial Nettle, Rough-Stalked Meadow Grass, Red Clover, Red Deadnettle, Redroot, Scrambling Fumitory, Scrambling Speedwell, Small-Flowered Geranium (Doves Foot), Sowthistle, Subterranean Clover, Suckling Clover, Sunspurge, Timothy Grass, White Deadnettle, Yorkshire Fog (Appendix 3).

3.1.3. RESIDUAL ACTIVITY AVOIDS APPLYING MULTIPLE TIMES

As a residual herbicide, oxadiazon provides longer-lasting protection, with only one to two applications per season typically required, compared to four or five applications needed with alternative products.

3.1.4. STABILITY REDUCES ENVIRONMENTAL IMPACT

Oxadiazon binds well to soil, breaking down via UV and microbial activity with minimal leaching risk, making it environmentally sustainable.

Oxadiazon is the preferred choice due to its effectiveness, longevity, and environmental stability. Its reduced application frequency and broad weed spectrum make it a practical and sustainable option for New Zealand's agricultural sector.

3.2. What alternatives are available that could replace the use of oxadiazon products? What are the relative costs, availability and safety of these alternatives?

Several alternatives to oxadiazon are available for weed control in crops like onions and blackcurrants, though each comes with limitations regarding effectiveness, cost, availability, and safety compared to oxadiazon.

3.2.1. ONION

In onion sectors, there are some herbicides registered to use. However, none of these products are comparable alternative to oxadiazon (see Appendix 3). Oxadiazon target a wide range of weeds, reducing the need for multiple herbicides. Below are the two examples to show the limitations of other herbicides available in the market.

PENDIMETHALIN (E.G. STOMP XTRA)

EPA: HSR000547; ACVM Registration No.P005921; concentration: 455 g/L

Effectiveness: Pendimethalin is a commonly used pre-emergent herbicide but has a narrower weed spectrum, often requiring multiple applications or follow-up treatments with other herbicides. It does not control perennial or established weeds. Weed control may be reduced where soil organic matter exceeds 6%.

Cost: It is generally comparable in price per application to oxadiazon, but the need for additional treatments increases the total cost.

Availability: Widely available, but it's less effective on certain stubborn weeds, making it a less optimal replacement.

Safety: Persistent use can lead to residue buildup in soil, which may affect long-term soil health.

OXYFLUORFEN (E.G., OX240)

Effectiveness: This contact herbicide can control broadleaf weeds but has limited residual activity, requiring multiple applications or combination with other herbicides to achieve season-long control.

Cost: Less expensive than oxadiazon per application; however, the need for repeated applications raises the overall cost.

Availability: Readily available, though often less effective for controlling specific weeds like wireweed.

Safety: Considered safe with proper handling, but repeated applications may increase exposure risks to applicators and the environment.

3.2.2. BLACKCURRANT

Blackcurrant industry has been trialling some alternatives; however, no effective alternatives have been concluded.

3.3. If oxadiazon products were no longer available for use in New Zealand, what would be the possible effects?

If oxadiazon products were no longer available for use in New Zealand, several significant effects could impact agricultural sectors, particularly those relying on effective weed control for crops like onions and blackcurrants.

3.3.1. INCREASED WEED PRESSURE AND REDUCED CROP YIELDS

Onions: As a slow-growing crop, onions are particularly susceptible to competition from weeds. Without oxadiazon, which provides effective post-emergent control of tough weeds such as wireweed, growers would face increased weed pressure. This would likely lead to reduced yields, as weeds would compete for essential nutrients, water, and sunlight.

Blackcurrants: Oxadiazon is also a safe pre-emergent option for blackcurrant cuttings. Without it, weed management in blackcurrant production would become more challenging, potentially affecting crop productivity.

3.3.2. INCREASE IN HERBICIDE RESISTANCE

With the loss of oxadiazon, growers will need to rely on a limited selection of herbicides. This lack of herbicide rotation may accelerate the development of weed resistance, making it increasingly difficult for growers to manage weeds effectively and maintain crop yields.

3.3.3. RELIANCE ON LESS EFFECTIVE ALTERNATIVES

Without oxadiazon, growers would need to rely on alternative herbicides, such as pendimethalin or oxyfluorfen. However, these products have narrower weed spectrums or require multiple applications, resulting in higher costs, increased labour, and reduced efficacy in weed control.

The limitations of these alternatives could lead to suboptimal weed management, increasing the likelihood of weed resistance over time and reducing the effectiveness of these herbicides for future seasons.

3.3.4. INCREASED APPLICATION FREQUENCY AND ENVIRONMENTAL IMPACT

Oxadiazon's residual activity allows for just one or two applications per season, while alternatives often require multiple applications. Increased application frequency would raise the cost for growers and potentially lead to more herbicide runoff and environmental exposure.

Without oxadiazon's soil stability and breakdown by UV and microbial activity, alternative products could result in greater leaching and potentially impact soil health and groundwater quality.

3.3.5. INCREASED COSTS AND OPERATIONAL CHALLENGES FOR GROWERS

Switching to alternatives would increase the direct costs associated with purchasing more herbicides, as well as indirect costs tied to increased labour and machinery use. The resulting financial pressure could particularly impact smaller growers, potentially leading to reduced profit margins or even reduced acreage in affected crops.

3.3.6. MARKET COMPLIANCE CHALLENGES AND EXPORT RISKS

New Zealand's onion sector is over 80% export-oriented (export to over 43 markets with a value of \$120 millions in 2022), with strict compliance requirements from international markets. Losing oxadiazon would limit the herbicide options available, making it harder to meet both domestic and international regulatory requirements. This could restrict market access or increase the risk of non-compliance, impacting the industry's export revenues.

In summary, the removal of oxadiazon would present serious challenges, including increased weed pressure, higher costs, reduced environmental sustainability, and potential impacts on New Zealand's export markets.

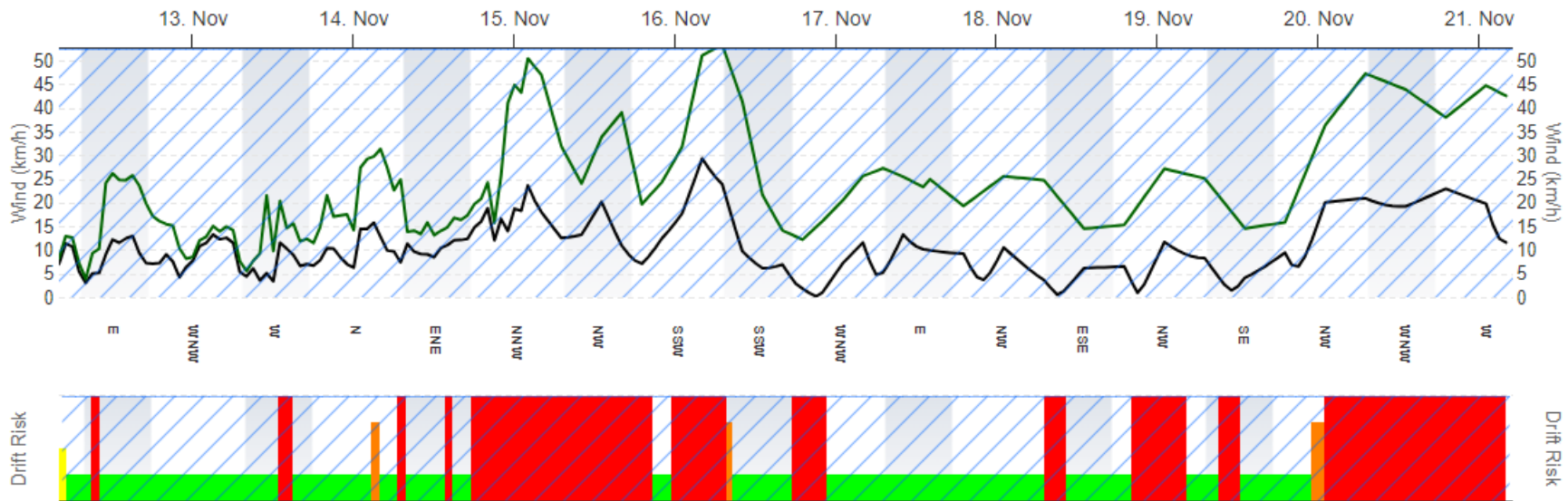
Appendix 1. Details on oxadiazon application methods, rate, and frequencies in onions and blackcurrants

Product identifier	Trade name	Crop and/or situation (a)	F, G, or I use (b)	Purpose of application (c)	Formulation			Application				Application rate per treatment			PHI (days) (l)	Remarks (m)
					Type (d-f)	active (s) conc. of as (i) g/L	Method /kind (f-h)	growth stage and season (j)	number min max (k)	interval between applications (min)	kg as/hL min max	water L/ha min max	Kg as/ha min max			
HSR000541	Foresite	Blackcurrants	F	Pre-emergent herbicide	SC	Oxadiazon	380	Pre-emergent application to bare soil, at 600L/ha	August or Sept (winter) over newly planted cuttings	1	Only 1 application on planting for life of planting (just establishment year)	4 L/ha	600L/ha	1.5 kg	500	
HSR101180	Exadia	Blackcurrants	F	Pre-emergent herbicide	SC	Oxadiazon	380	Pre-emergent application to bare soil, at 600L/ha	August or Sept (winter) over newly planted cuttings	1	Only 1 application on planting for life of planting (just establishment year)	4 L/ha	600L/ha	1.5 kg	500	
HSR101180	Exadia	Onions	Outdoor	herbicide	SC	Oxadiazole	380	Spraying, ground-based application	4 Leaf stage	2	21 days apart			1 L/ha	60	It's an important post emergence herbicide for a number of weeds.
HSR100445	Oracle	Onions	Outdoor	herbicide	SC	Oxadiazole	380	Spraying, ground-based application	4 Leaf stage	2	21 days apart			1 L/ha	60	It's an important post emergence herbicide for a number of weeds.

Remarks	<ul style="list-style-type: none"> (a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (for example, fumigation of a structure) (b) Outdoor or field use (F), glasshouse application (G) or indoor application (I) (c) Description of purpose of application (for example, bud break promoter, thinning agent, insecticide, herbicide). Include information of target pests if appropriate. (d) For example, wettable powder (WP), emulsifiable concentrate (EC), granule (GR) (e) GCPF Codes - GIFAP Technical Monograph No 2, 1989 (f) All abbreviations must be explained (g) Method, for example, high volume spraying, low volume spraying, spreading, dusting, drench 	<ul style="list-style-type: none"> (h) Kind, for example, overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated, spray droplet spectrum, particular application equipment (such as nozzle types) (i) g/kg or g/l (of active substance (as)) (j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3 8263-3152-4), including where relevant, season at time of application (k) The minimum and maximum number of application possible under practical conditions of use must be provided (l) PHI - minimum pre-harvest interval (m) Remarks may include: extent of use, economic importance, restrictions.
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Appendix 2. A screenshot of a tool used by onion growers to mitigate the drift risk when spread

[Onions NZ Weather & Disease Portal](#)



Green is best condition for spray; lime yellow is suitable with caution ; orange is extreme caution; red is not recommended.

Appendix 3. NZ registered products to be used in onion to control weeds

- a. The one crossed out under oxadiazon row are the weeds that can be controlled with one or more of other herbicides in the table. This shows that there is still a significant list of weed that oxadiazon can control that other available registered actives can not.
- b. Chlorthal-dimethyl is under reassessment

Trade name	Active	NZ registered use
Foresite®; Exadia	oxadiazon ^a	Annual POA, Barley Grass, Barnyard Grass , Bittercress, Black Nightshade , Broad-Leaved Plantain, Browntop, Cleavers , Cornbind , Creeping Buttercup, Crested Dogstail, Crowfoot Grass , Cut-Leaved Geranium, Docks, Fathen, Field Speedwell, Fumitory , Galinsoga , Giant Buttercup, Green Bristle Grass, Groundsel , Italian Ryegrass , Kentucky Bluegrass, Mouse-Ear Chickweed, Narrow-Leaved Plantain, Nettle , Oxalis Corniculata, Oxalis Latifolia, Oxalis Stricta, Paspalum , Perennial Nettle, Portulaca , Rough-Stalked Meadow Grass, Red Clover, Red Deadnettle, Redroot , Scrambling Fumitory, Scrambling Speedwell, Shepherd's Purse , Small-Flowered Geranium (Doves Foot), Smooth Witchgrass , Sowthistle, Spurrey , Stinking Mayweed , Subterranean Clover, Suckling Clover, Summer Grass , Sunspurge, Timothy Grass, Twineress , White Clover , White Deadnettle, Wild Turnip , Willow Weed , Wireweed , Witchgrass , Yorkshire Fog
Stomp® Xtra; Agro Vienna; Pend-X™, Pendimethex®; Ruck™; Strada® 400SC	pendimethalin	Black nightshade, Chickweed, Cornbind*, Fathen, Field pansy, Fumitory, Henbit, Redroot*, Scarlet pimpernel, Shepherds purse*, Speedwell, Spurrey, Stinking mayweed*, Storksbill*, Wild oats*, Wireweed
Oxy™ 500 SC; Baron, Galigan 500 SC	oxyfluorfen	Bitter cress, black nightshade, catsear, cleavers, cut leaved geranium, fathen (partial control), field bindweed fumitory, field madder, field pansy, groundsel, hedge mustard, mouse eared chickweed, nettle, parsley piert, pennyroyal, redroot, mallows, sea radish, seedling docks, shepherd's purse, sow thistle, speedwells, storksbill, twin cress, wild portulaca, wild turnip and wireweed
Chlor-Back™ 75WG, Dacthal® 75W	chlorthal-dimethyl ^b	Annual poa, barnyard grass, crowfoot grass, smooth witchgrass, yellow bristlegrass, black nightshade, chickweed, fathen, nettle, redroot, wild portulaca, wireweed

Tribunil®	methabenzthiazuron	Black nightshade, charlock, chickweed, fathen, field speedwell, fumitory, galinsoga, groundsel, henbit, nettle, plantains, annual poa, redroot, scentless chamomile, shepherd's purse, spurrey, small-flowered buttercup, stinking mayweed, twin cress, white campion, wild radish, wild turnip, willow weed.
Alliacine® 40EC; Agri-IPC; Chloro IPC	chlorpropham	Black nightshade, Chickweed, Docks, Fathen, Foxtail, Fumitory, Paspalum, Annual poa, Italian ryegrass, Speedwells, Spurrey, Willow weed
Ethomate®	Ethofumesate	black nightshade, fathen, fumitory, hairy nightshade, spurrey, twincrest, white clover and wireweed
Alanex®; Corral™, Taipan™, Cyclone	alachlor	Annual Poa, Barnyard grass, Black nightshade, Bristle grass, Crowfoot grass, Fathen, Redroot, Summer grass and Witchgrass
Frontier® P	dimethenamid-p	Barnyard grass, bristle grass, rough bristle grass, crowfoot grass, smooth witch grass and summer grass. Apple of Peru, black nightshade, seedling dock, redroot, spurrey, twincrest, willow weed. Fathen may be controlled on light soils (low CEC values) under ideal conditions.
Ramrod®	propachlor	Annual poa, barnyard grass (Echinochloa crus-galli), broomcorm millet (Panicum spp.), chickweed (Stellaria media), groundsel (Senecio vulgaris), smooth witchgrass, summer grass (Digitaria sanguinalis), witchgrass.
Flag Flo; Chloronion™; Pyramin® DF	chloridazon	Annual poa, Penny cress, Barnyard grass, Black nightshade, Rayless chamomile, Cleavers, Charlock, Redroot, Curled dock, Chick weed, Speedwells, Fumitory, Docks, Water purslane, Spurrey, Fathen, Wild carrot, Summer grass, Galinsoga, Wild radish, Groundsel, Willow weed
Afalon®, Linex™ Flo, Linuron 50DF	linuron	Charlock Chickweed Cornbind Fat Hen Nettle Penny Cress Scarlet Pimpernel Shepherd's Purse Sow Thistle Spurrey
Troy® 480SL; Bentazone 480SC; Delete; Broadstar® ; Dictate 480™; Basagran®	bentazone	Chamomiles, Stinking mayweed, Cleavers, Storksbill, Onehunga weed and other broad-leaved weeds