

Frontier® Optima

Reg. No. L7011; N-AR 0803

Act No. 36 of 1947

**READ ATTACHED PACKAGE LEAFLET BEFORE USE
KEEP OUT OF REACH OF CHILDREN AND ANIMALS**

GROUP	15	HERBICIDE
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An emulsifiable concentrate pre-emergent herbicide, for control of annual grasses and annual broadleaf weeds (as indicated), and under certain conditions also yellow nutsedge, in dry beans, grain sorghum, groundnuts, kidney beans, maize, potatoes, soya beans and tobacco.

'n Emulgeerbare konsentraat voor-opkomsoukruidodder, vir die beheer van eenjarige grasse en eenjarige breëblaaronkruid (soos aangetoon), en onder sekere omstandighede ook geelintjies, in aartappels, groëbone, graansorghum, grondbone, mielies, nierbone, sojabone en tabak.

Hazard statements:

- Causes serious eye irritation.
- Causes skin irritation.
- Harmful if swallowed.
- May cause an allergic skin reaction.
- May cause respiratory irritation.
- Very toxic to aquatic life with long lasting effects.

Precautionary statements:

- Wear protective gloves and eye protection or face protection.
- Avoid breathing mist or vapour or spray.

Active ingredients / Aktiewe bestanddele:

Dimethenamid-P (chloroacetamide).....720 g/t

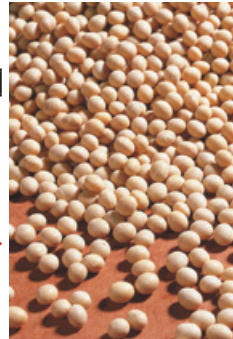
Registered by:

BASF South Africa (Pty) Ltd. Co. Reg. No. 66/10235/07, 852 Sixteenth Road, P.O. Box 2801, Halfway House 1685, +27 11 203 2400

Batch No. & Date manufactured: Refer to details printed on container
Lotnommer & Datum vervaardig: Verwys na besonderhede gedruk op houer

UN-No. / VN-Nr: 3082

EMERGENCY NUMBERS +27 82 446 8946 or +27 11 203 2420
In case of poisoning, call the following number: +27 861 555 777



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WARNINGS

Hazard Statements

- Causes serious eye irritation.
- Causes skin irritation.
- Harmful if swallowed
- May cause an allergic skin reaction.
- May cause respiratory irritation.
- Very toxic to aquatic life with long lasting effects.

Allow the following minimum number of days between last application and harvest or grazing:

Maize

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- Keep locked up, out of the reach of children, uninformed persons and animals.
- Keep in the original container and store in a cool place away from food and feeds.
- Prevent contamination of food, feed, drinking water and eating utensils.
- May cause sensitization in contact with skin.
- RE-ENTRY INTERVAL: Do not enter treated area within 1 day after treatment unless wearing protective clothing.

Although this remedy has been tested under a large variety of conditions the registration holder does not warrant that it will be efficacious under all conditions because the action and effect thereof may be affected by factors such as abnormal soil, climatic and storage conditions, quality of dilution water, compatibility with other substances not indicated on the label, and the occurrence of resistance of the weeds against the remedy concerned as well as by the method, time and accuracy of application. The registration holder furthermore does not accept responsibility for damage to crops, vegetation, the environment or harm to man or animal or for lack of performance of the remedy concerned due to the occurrence of conditions which could not have been foreseen in terms of the registration. Consult the supplier in the event of any uncertainty.

Precautionary Statements

- If medical advice is needed, have product container or label at hand.
 - Keep out of reach of children.
 - Read carefully and follow all instructions.
 - Wear protective gloves and eye protection or face protection.
 - Avoid breathing mist or vapour or spray.
 - Use only outdoors or in a well-ventilated area.
 - Contaminated work clothing should not be allowed out of the workplace.
 - Do not eat, drink or smoke when using this product.
 - Wash contaminated body parts thoroughly after handling.
 - Call a POISON CENTRE or physician if you feel unwell.
 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 - IF ON SKIN: Wash with plenty of soap and water.
 - If skin irritation or rash occurs: Get medical attention.
 - Rinse mouth.
 - Collect spillage.
 - If skin irritation occurs: Get medical attention
 - Take off contaminated clothing and wash it before reuse.
 - If eye irritation persists: Get medical attention.
 - Store in a well-ventilated place. Keep container tightly closed.
 - Store locked up.
 - Dispose of contents and container to hazardous or special waste collection point.
- Wear rubber gloves and boots, overall and face shield, when handling the concentrate and whilst applying.
 - TRIPLE RINSE THE EMPTY CONTAINER AS FOLLOWS: Invert the empty container over the spray or mixing tank and drain for at least 30 seconds after the flow has slowed down to dripping. Thereafter rinse the empty container three times in succession with one quarter of the container volume fresh water and decant the rinsate into the spray or mixing tank. Puncture the triple rinsed container and dispose of via an approved collector or recycler (www.croplife.co.za). Do not bury, burn or donate the container to any other parties that may use it as a container for food or beverages
 - Dispose of equipment wash water where it will not contaminate crops, grazing, rivers, dams etc.

RELEVANT SUBSTANCES

Hazardous ingredients According to UN GHS criteria	CAS number	Concentration (W/W)
dimethenamid-P	163515-14-8	64 %
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified; [A complex combination of hydrocarbons obtained from distillation of aromatic streams. It consists predominantly of aromatic hydrocarbons having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of approximately 165 °C to 290 °C (330 °F to 554 °F).]	64742-94-5	< 30 %
2-Methylnaphthalene	91-57-6	< 15 %
1-Methylnaphthalene	90-12-0	< 10 %
POE (6) Tridecyl ether phosphate, reaction product with POE (5) soya amine		< 10 %
Oxirane, methyl-, polymer with oxirane, monobutyl ether	9038-95-3	< 5 %
Biphenyl	92-52-4	< 3 %

FIRST AID TREATMENT

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

ON CONTACT WITH EYES:	Wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.
ON INGESTION:	Immediately rinse mouth and then drink 200 to 300 ml of water, seek medical attention.
ON SKIN CONTACT:	Wash thoroughly with soap and water.
IF INHALED:	Keep patient calm, remove the patient to fresh air, seek medical attention.

TREATMENT: Treat according to symptoms (decontamination, vital functions), no known specific antidote

USE RESTRICTIONS

- Avoid spray drift onto desirable vegetation, or non-target areas. desirable vegetation, or non-target areas.
- Prevent contamination of grazing, rivers, dams and areas not under treatment.
- Avoid overlapping spray swaths.

WITHHOLDING PERIOD

- Following normal harvest of crop treated with **Frontier® Optima**, there is no restriction on planting any other follow-up crops.
- In the event of weather induced failure of a crop treated with **Frontier® Optima** alone, lands can be immediately replanted with any **Frontier® Optima** registered crop. **Under such conditions, reliance should be made on post-emergent weed control.**
- In the event of **Frontier® Optima** having been applied with another herbicide, refer to the specific label for that herbicide.

RESISTANCE WARNING

Frontier® Optima is a member of the chloroacetamide group of herbicides. The mode of action of this group is primarily the inhibition of cell division, and as such it is classified by HRAC as a Group Code 15 herbicide.

Certain naturally-occurring weed biotypes resistant to **Frontier® Optima** and other cell division inhibiting herbicides may exist through normal genetic variability in any weed population. The resistant individuals can eventually dominate the weed population, if this group of herbicides are used repeatedly. These resistant weeds will not be controlled by **Frontier® Optima** and are unlikely to be controlled by other herbicides which inhibit cell division.

Since the presence of resistant weeds is difficult to detect prior to herbicide application, it is of the utmost importance that treated areas be inspected at regular intervals to timeously identify the occurrence of herbicide-resistant weeds. BASF SA (Pty) Ltd will not accept liability for performance failures in the event of a build-up of resistant weeds, resulting from inadequate resistance management practices.

To delay herbicide resistance:

- Avoid exclusive, repeated use of herbicides from the same Herbicide Group Code.
- Integrate other control methods (chemical rotation, cultural, crop rotation, biological), into weed control programmes.

FOR SPECIFIC INFORMATION ON RESISTANCE MANAGEMENT, CONTACT YOUR LOCAL BASF SA (Pty) Ltd REPRESENTATIVE.

DIRECTIONS FOR USE: USE ONLY AS DIRECTED

NOTICE TO USER: This agricultural remedy is to be used only in accordance with the instructions on the label. It is an offence under Act No. 36 of 1947 to use this agricultural remedy for any purpose in a manner contrary to the directions on the label.

General information:

- **Frontier® Optima** is a pre-emergent, broad-spectrum herbicide for the control of annual grasses and annual broadleaf weeds (as indicated) and under certain conditions also yellow nutsedge.
- The site of uptake of **Frontier® Optima** by weeds is through the coleoptile in monocotyledonous plants (grasses) and through the hypocotyl and developing roots in dicotyledonous plants (broadleaf weeds). Uptake occurs between germination of the seed and emergence of the seedling from the soil.
- The timing of application should therefore occur in time to enable **Frontier® Optima** to enter the soil moisture (activation) and reach the target site, prior to the emergence of the weeds.
- Rain or irrigation is required prior to weed emergence, to facilitate activation.
- Late applications or activation, or applications to already emerged weeds will result in greatly reduced efficacy.

Compatibility:

Frontier® Optima is compatible with:

- Registered atrazine SC formulations containing 500 g/l active ingredient.
- **Hammer®** (L5201), refer to the **Hammer®** label for further details.
- Gesaprim Super® 600 SC (L3914).

Always refer to the relevant product labels mentioned.

The compatibility of other / alternate formulations of the above products is unknown.

Mixing instructions:

- Three-quarter fill the spray tank with clean water. Shake the **Frontier® Optima** container well.
- Measure the required volume of **Frontier® Optima** and pre-mix this with at least 10 l of water before adding to the spray tank.
- Fill the spray tank with water to the required level, while maintaining agitation to ensure thorough mixing of the spray mixture.
- If any other products are to be mixed with **Frontier® Optima**, individually pre-mix the required volume of each product in similar fashion before adding to the spray water.

- When **Frontier® Optima** is tank mixed with herbicides of an SC or WG formulation, these herbicides should be added to the spray water first.
- Maintain agitation while mixing and spraying.
- The prepared spray mixture must not be left in the spray tank for any length of time, e.g. overnight.

APPLICATION INSTRUCTIONS

Ground application:

- **Frontier® Optima** can be applied as either an overall application, using a minimum of 200 l of water / hectare, or as a band application, using the corresponding amount of water per sprayed hectare.
- Any medium or high volume tractor-mounted sprayer can be used, as long as the sprayer can be properly calibrated and is fitted with effective tank agitation.
- The spray-boom should be fitted with flat fan type spray nozzles to ensure a uniform, even distribution of the herbicide on the soil surface.

Aerial application:

For aerial application, increase all given rates by 10%.

Aerial application of **Frontier® Optima** may only be done by a registered aerial application operator using a correctly calibrated, registered aircraft according to the instructions of SANS Code 10118 (Aerial Application of Agricultural Pesticides). Ensure that the spray mixture is distributed evenly over the target area and that the loss of spray material during application is restricted to a minimum. It is therefore essential that the following criteria be met:

- **Volume:** A spray mixture volume of 30 l per hectare is recommended. As this product has not been evaluated at a reduced volume rate, the registration holder cannot guarantee efficacy, or be held responsible for any adverse effects if this product is applied aerially at a lower volume rate than recommended above.
- **Droplet coverage:** 20 – 30 droplets per cm² must be recovered at the target area.
- **Droplet size:** A droplet spectrum with a VMD of 350 – 400 micron is recommended. Limit the production of fine droplets less than 150 micron (high drift and evaporation potential) to a minimum.
- **Flying height:** Maintain the height of the spray boom at 3 – 4 metres above the target. Do not spray when aircraft dives, is in a climb or when banking
- Use suitable **atomising equipment** that will produce the desired droplet size and coverage, but which will ensure the minimum loss of product. The spraying system must produce a droplet spectrum with the lowest possible Relative Span.
- **Position** all the atomisers within the inner 60 – 75% of the wingspan to prevent droplets from entering the wingtip vortices.
- The difference in **temperature** between the wet and dry bulb thermometers, of a whirling hygrometer, should not exceed 8°C.

- Stop spraying if the **wind speed** exceeds 15 km/h.
- Stop spraying under turbulent, unstable and dry conditions during the heat of the day.
- Spraying under temperature inversion conditions (spraying in or above the inversion layer) and / or high humidity conditions (relative humidity 80% and above) may lead to the following:
 - Reduced efficacy due to suspension and evaporation of small droplets in the air (inadequate coverage).
 - Damage to other sensitive crops and / or non-target areas through drifting of the suspended spray cloud away from the target field.
- Ensure that the aerial spray operator knows exactly which fields to spray.
- Obtain an assurance from the aerial spray operator that the above requirements will be met and that relevant data will be compiled in a logbook and kept for future reference.

Centre pivot application:

Frontier® Optima may be applied through centre pivot application, in accordance with the **APPLICATION RATES** and **DIRECTIONS FOR APPLICATIONS**, as indicated below and provided that the following conditions are met:

- Use only centre pivot systems that apply water uniformly.
- Use only injection pumps that can be calibrated accurately.
- Apply in a maximum of 10 mm water. **Do not exceed this water volume.**
- Keep the herbicide in suspension with sufficient continuous agitation.
- The centre pivot system must have anti-syphon and check valves, to prevent contamination of the water source during shutdown and possible overflow of the mixing tank.
- Inject the herbicide mixture ahead of any right angle bend in the main water line, to ensure adequate mixing.
- Simultaneous shut-off of the chemical injection and water pumps must be possible.
- Application in windy conditions that may result in spray drift, must be prevented. Leaking joints and nozzles not providing uniform application, may cause crop injury.
- Sprinkler distribution patterns not overlapping sufficiently, may result in poor weed control. Excessive overlapping may cause crop damage, or lead to high residues.

Method: Prepare a mixture with a minimum of one part of herbicide to one part of water and inject this mixture into the centre pivot system, using a positive displacement pump. Injecting a larger volume (more dilute mixture per hour), will usually provide more accurate calibration of the injection pump system.

Warning: Due to depressions and uneven soil surfaces, pivot applications could result in puddle formation. Should this occur directly over the crop seedlings, damage will occur. Apply to an even land.

Table 1. Application rates on dry beans, kidney beans and soya beans.

CROP	% CLAY	DOSAGE /ha	DIRECTIONS FOR APPLICATION
DRY BEANS, KIDNEY BEANS SOYA BEANS	11 – 20	0,5 – 0,75	Use the lower rate only for control of annual grasses. Use the higher rate, if yellow nutsedge and / or broadleaf weeds are a problem.
	21 – 30	0,75 – 1,0	
	31 – 40	1,0 – 1,25	

WARNING

Do not apply **Frontier® Optima** to dry beans, kidney beans or soya beans planted in a soil with a clay content of less than 10%, as under certain climatic conditions crop damage may occur.

NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.

Table 2. Application rates on grain sorghum.

CROP	% CLAY	DOSAGE /ha	DIRECTIONS FOR APPLICATION
GRAIN SORGHUM	0 – 20	0,4 – 0,7	Use the lower rate only for control of annual grasses. Use the higher rate, if yellow nutsedge and / or broadleaf weeds are a problem.
	21 – 30	0,7 – 0,9	
	31 – 40	0,9 – 1,2	
	> 40	1,2	

WARNINGS

BASF SA (Pty) Ltd. accepts no liability for any damage that may occur to cultivars not reflected on this label.

Frontier® Optima is only recommended on the following grain sorghum cultivars that have undergone seed treatment with Concep® (L5051):

The effect of **Frontier® Optima** on other cultivars is unknown.

CRN 7610	PAN 8509	PAN 8591	NK 283	SNK 3727	CRN 7611	PAN 8560
NK 222	NK 286	VS 881	DC 75	PAN 8564	NK 280W	NK 304

NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.

Table 3. Application rates on groundnuts.

CROP	% CLAY	DOSAGE l/ha	DIRECTIONS FOR APPLICATION
GROUNDNUTS	0 – 10	0,5	Use the lower rate only for control of annual grasses. Use the higher rate, if yellow nutsedge and / or broadleaf weeds are a problem.
	11 – 20	0,5 – 0,75	
	21 – 30	0,75 – 1,0	
	31 – 40	1 – 1,25	
WARNING			
Application of Frontier® Optima to groundnuts planted in soils with a clay content of less than 10%, may sustain damage under certain climatic conditions.			
NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.			

Table 4. Application rates on maize.

CROP	% CLAY	DOSAGE l/ha	DIRECTIONS FOR APPLICATION
MAIZE	0 – 10	0,5	Use the lower rate only for control of annual grasses. Use the higher rate, if yellow nutsedge and / or broadleaf weeds are a problem.
	11 – 20	0,5 – 0,75	
	21 – 30	0,75 – 1,0	
	31 – 40	1,0 – 1,25	
	> 40	1,25	
Pre-emergent weed control with Frontier® Optima alone:			
<ul style="list-style-type: none"> Where broadleaf weeds are not a major problem, Frontier® Optima may be applied alone. 			
Pre-emergent weed control with Frontier® Optima in tank mixtures (all soil types):			
<ul style="list-style-type: none"> Where broadleaf weeds are a major problem, the following tank-mix options are recommended: Atrazine 500 SC or Gesaprim Super® 600 SC at 1 – 2 l/ha. Later applications may be applied, provided they are applied as a directed spray and prior to the emergence of weeds (e.g. after a cultivation). Weeds that have emerged at the time of application will not be controlled. 			
Pre-emergence of weeds, post emergence of the crop:			
<ul style="list-style-type: none"> Frontier® Optima can be applied post-emergent of the crop as a residual herbicide treatment with a directed inter-row spray before the maize crop reaches the BBCH 31 (first node detectable above ground) growth stage. Weeds that have already germinated at the time of this application will not be controlled by Frontier® Optima. Under certain conditions, especially when additional adjuvants are used, applications over the crop after the BBCH 31 growth stage may result in plant damage within the whorl. This may allow secondary infections of fungi or bacteria and subsequent crop loss. 			
NB: Frontier® Optima may be applied on sweet corn and popcorn.			
<ul style="list-style-type: none"> If using a tank-mix, ensure that the partner product is also registered for use on sweet corn and / or popcorn. 			
For late germinating weeds the following post-emergent products are registered:			
<ul style="list-style-type: none"> Basagran® (L2916) or Basagran® plus Atrazine 500 g/ha. Stellar® Star (L9391) Campus® (L8521) 			
<i>Refer to the respective product labels.</i>			
NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.			

Table 5. Application rates on potatoes.

CROP	% CLAY	DOSAGE €/ha	DIRECTIONS FOR APPLICATION
POTATOES	0 – 10 11 – 20 21 – 30 31 – 40	0,4 – 0,5 0,5 – 0,7 0,7 – 0,9 0,9 – 1,2	Apply after ridging. Where applicable, use the lower rate only for control of annual grasses. Use the higher rate, if yellow nutsedge and / or broadleaf weeds are a problem.
NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.			

Table 6. Application rates on tobacco.

CROP	% CLAY	DOSAGE €/ha	DIRECTIONS FOR APPLICATION
TOBACCO	0 – 20 21 – 30 31 – 40	0,7 1,0 1,2	Only strong healthy plants should be used, with roots well settled into the soil. Do not use Frontier® Optima on tray transplants.
<p>Method and timing of application in tobacco:</p> <ul style="list-style-type: none"> Apply Frontier® Optima as a total surface application, within three days after planting of the tobacco, while the plants are still wilted. Where tobacco is planted on ridges, apply using a boom fitted with 110° nozzles, positioned between the ridges. This will ensure a more even distribution of the herbicide. Within 3 – 4 days after application of Frontier® Optima, not more than 15 mm of irrigation should be applied, to avoid washing out and to ensure activation of product. FLUE CURED TOBACCO – Apply Authority® 75 WG (L6262) for <i>Cyperus rotundus</i> control as well as improved <i>Cyperus esculentus</i> and broadleaf control, as a sequential spray (not as a tank mix), immediately after application of Frontier® Optima. Consult the respective label of Authority® 75 WG. 			

WARNINGS

After the **Frontier® Optima** application on tobacco, a slight yellowing of the sand leaves and / or plant stunting may occur. This is of a temporary nature and should not have any negative effect on the yield. However, certain precautions should be observed, as the likelihood of damage occurring is enhanced by the following conditions:

- When diseased, weak and / or damaged plants are used for transplanting;
- when plants are incorrectly planted with roots curled up or roots exposed to the herbicide, at the time of application;
- when tobacco is planted in very stony or gravel soil;
- when rainfall or irrigation in excess of 15 mm occurs shortly after herbicide application;
- when treated soil comes into contact with roots of inter-plants;
- when plants are less than 150 mm tall;
- when applied over hail damaged tobacco plants.

NB: ALSO REFER TO USE RESTRICTIONS, RESISTANCE WARNING, DIRECTIONS FOR USE AND IMPORTANT NOTES.

Important Notes

1. **Frontier® Optima** must be applied at, or after planting, but prior to the emergence of weeds.

2. When **planting into moist soil**, **Frontier® Optima** must be applied within three days after planting (but preferably at planting), onto a fine, even, firm and freshly prepared weed-free seedbed. **No more than three days should elapse between cultivation and application.**

- To obtain good results, it is necessary that application be followed by 10 – 15 mm of rain or sprinkler irrigation, before the weeds emerge.
- If rainfall does not occur in time, emerging weeds will be stunted and can easily be controlled with a shallow cultivation that will simultaneously mix the herbicide with the top 10 – 20 mm of soil.
- Deep cultivation should be avoided, as this will dilute the product in the soil and deposit untreated soil on the surface. This will result in poor weed control.

3. When **planting into dry soil**, (insufficient moisture for germination), **Frontier® Optima** must be applied as close to, but definitely before, the first rain. Weeds that have already emerged at the time of application, will not be controlled.

- Under dry conditions, efficacy will be improved by a shallow incorporation of the product – not deeper than 10 – 20 mm.
- Deep cultivation should be avoided, as this will dilute the product in the soil and deposit untreated soil on the surface. This will result in poor weed control.

4. Soil displacement:

- On light sandy soils of 0 – 10% clay, (e.g.: Certain top soils in the North West Province, north west Free State and Northern Cape), weed control will be reduced, if winds remove **Frontier® Optima** treated soils and re-deposit them elsewhere.
- Weed control may also be reduced, if heavy rains erode or wash away the soil surface containing the herbicide.

- Application to a poorly prepared seedbed with clods on the soil surface will result in reduced efficacy.
- Where crops have been planted in furrows and rains redeposit the treated soil from the sides of the furrow into a concentrated layer directly above the planted seeds, crop damage may occur.

5. Minimum cultivation or no-till situations:

- Surface trash may reduce herbicidal efficacy penetration into the soil. The higher rate for the relevant soil type, will give a better result.

6. Prolonged cool and wet weather conditions, excessive irrigation, infection of seed and young seedlings by soil- or seed borne diseases, seeds planted too deep or too shallow etc. may lead to crop damage. Where applicable, seeds should therefore preferably be treated with a suitable seed treatment fungicide.

7. Do not apply Frontier® Optima in the following situations as crop damage may occur:

- On poorly drained soils, soils with a compaction layer or soils with nutrient deficiencies.
- On inbred parent plants of maize hybrids, or experimental, or newly released cultivars of all **Frontier® Optima** registered crops, including any seed production of any of the **Frontier® Optima** registered crops, without first consulting the advice of the distributor or manufacturer.
- Crop damage can also be expected where soil capping occurs, prior to the emergence of the seedlings, or if seedling germination is retarded.

WEEDS CONTROLLED

The following plant species are normally controlled by a pre-emergent application of **Frontier® Optima**, at the indicated dosage rates.

GRASSES			
<i>Brachiaria eruciformis</i>	Sweet Signal Grass	<i>Panicum schinzii</i>	Sweet Buffalo Grass
<i>Digitaria sanguinalis</i>	Crab Finger Grass	<i>Setaria faberi</i>	Giants foxtail
<i>Digitaria ciliaris</i>	Tropical finger-grass	<i>Setaria pallide-fusca</i>	Red Bristle Grass
<i>Echinochloa crus-galli</i>	Barnyard Grass	<i>Setaria verticillata</i>	Sticky Bristle Grass
<i>Eleusine corocana</i>	Goose Grass	<i>Urochloa panicoides</i>	Herringbone Grass
<i>Panicum maximum</i>	Guineagrass		

BROADLEAFS			
<i>Amaranthus hybridus</i>	Common Pigweed	¹ <i>Datura stramonium</i>	Thorn Apple
<i>Amaranthus spinosus</i>	Thorny Pigweed	<i>Galinsoga parviflora</i>	Gallant soldier
<i>Amaranthus deflexus</i>	Perennial Pigweed	<i>Nicandra physaloides</i>	Apple of Peru
¹ <i>Bidens pilosa</i>	Black jack	<i>Portulaca oleracea</i>	Purslane
¹ <i>Chenopodium album</i>	White Goosefoot	<i>Richardia brasiliensis</i>	Tropical Richardia
<i>Cleome monophylla</i>	Spindlepod	<i>Schkuhria pinnata</i>	Dwarf Marigold
¹ <i>Commelina benghalensis</i>	Bengal Wandering Jew	¹ <i>Tagetes minuta</i>	Khaki Weed
¹ <i>Crotalaria sphaerocarpa</i>	Mealie Crotolaria	¹ <i>Tribulus terrestris</i>	Devil's Thorn
¹ <i>Datura ferox</i>	Large Thorn Apple	¹ <i>Xanthium strumarium</i>	Cocklebur

¹ **The control of these weeds is variable.**

Late and deep germinating weeds will not be effectively controlled.

SEDGES		
<i>Cyperus esculentus</i>	Yellow Nutsedge	

Control of yellow nutsedge can be improved, provided the following conditions are met:

- Planting is immediately preceded by thorough ploughing, with a mouldboard plough.
- A fine, even and firm seedbed is prepared.
- Application is followed by at least 10 – 15 mm of soft penetrating rain (or irrigation), to wash the herbicide into the soil, prior to the emergence of yellow nutsedge (normally 7 – 10 days after ploughing). More rain is required on heavier soils to obtain good results. Insufficient moisture is often the reason why poor control is experienced on turf soils.
- When planting into moist soil, application of **Frontier® Optima** should be made at, or immediately after, planting, to ensure herbicide activation prior to emergence of yellow nutsedge.
- When planting into dry soil (insufficient moisture for yellow nutsedge germination), **application should be timed as close as possible to, but definitely before the first rain.**

Other plant species that were not present during the development trials with Frontier® Optima, may also be controlled to a certain degree. The registration holder does not accept any responsibility for unlisted plant species.

CONDITIONS OF SALE AND WARRANTY

The **DIRECTIONS FOR USE** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of this product in a manner inconsistent with its labelling, all of which are beyond the control of BASF South Africa (Pty) Ltd ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **DIRECTIONS FOR USE**, subject to the inherent risks, referred to above.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S EXCLUSIVE REMEDY AND BASF'S EXCLUSIVE LIABILITY, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY, OR OTHERWISE, SHALL BE LIMITED TO REPAYMENT OF THE PURCHASE PRICE OF THE PRODUCT.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF AND THE SELLER DISCLAIM ANY LIABILITY FOR CONSEQUENTIAL, EXEMPLARY SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

BASF and the Seller offer this product, and the Buyer and User accept it, subject to the foregoing Conditions of the Sale and Warranty, which may be varied only by agreement in writing signed by a duly authorized representative of BASF

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AFRIKAANS

WAARSKUWINGS

Gevaarstellings

- Veroorsaak ernstige oogirritasie.
- Veroorsaak velirritasie.
- Skadelik indien ingesluk.
- Mag 'n allergiese velreaksie veroorsaak.
- Mag respiratoriese irritasie veroorsaak.
- Uiters giftig vir akwatiese lewe met langdurige effek.

Laat die volgende minimum aantal dae toe, tussen die laaste toediening en oes of beweiding:

Mielies	28
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- Bêre agter slot en grendel buite bereik van kinders, oningeligte persone en diere.
- Bêre in die oorspronklike houer, op 'n koel plek en weg van voedsel en voer.
- Verhoed kontaminasie van voedsel, voer, drinkwater en eetgerei.
- Mag sensitiwiteit veroorsaak indien met vel in kontak kom.
- HERBETREDING: Moet nie behandelde gebied betree vir 1 dag na die bespuiting nie, tensy beskermde oorklere gedra word.

Alhoewel hierdie middel onder 'n groot verskeidenheid toestande getoets is, waarborg die registrasiehouer nie dat dit onder alle toestande doeltreffend sal wees nie, aangesien die werking en effek daarvan, deur faktore soos abnormale grond-, klimaats- en bergingstoestande, kwaliteit van verdunningswater, verenigbaarheid met ander stowwe wat nie op die etiket aangedui is nie, en die voorkoms van weerstand by onkruid teen die betrokke middel beïnvloed kan word, die metode, tyd en akkuraatheid van toediening kan ook die werking en doeltreffendheid van die middel beïnvloed. Verder aanvaar die registrasiehouer nie verantwoordelikheid vir skade aan gewasse, plantegroei en die omgewing nie, of vir nadelige effek op mens of diër nie, of vir onvoldoende prestasie van die betrokke middel weens die versuim van die gebruiker om etiketaanwysings na te kom nie, of weens toestande wat nie kragtens die registrasie voorsien kon word nie. Raadpleeg die verskaffer in geval van enige onsekerheid.

VOORSORGMATREËLS

Voorsorgstellings

- Indien mediese advies nodig is, hou die produkhouer of etiket byderhand.
- Hou buite bereik van kinders.
- Lees versigtig deur en volg alle instruksies.
- Dra beskermende handskoene en brille of gesigskerm.
- Moenie spuitnewel of dampe inasem nie.
- Gebruik slegs buite of in 'n goed geventileerde area.
- Besoedelde klere mag nie buite die werksplek toegelaat word nie.
- Moenie eet, rook of drink terwyl die produk gebruik word nie.
- Was gekontameneerde liggaamsdele deeglik nadat produk hanteer is.
- Skakel 'n GIFSENTRUM of geneesheer indien u siek voel.
- **INDIEN IN DIE OË:** Spoel aangetaste oë versigtig met water uit vir 'n paar minute. Verwyder kontaklense indien teenwoordig en net as dit maklik is om te verwyder. Gaan voort om oë uit te spoel.
- **INDIEN INGEASEM:** Verwyder persoon na vars lug en hou gemaklik sodat persoon kan asemhaal.
- **INDIEN OP DIE VEL:** Was met baie seep en water.
- Indien velirritasie of uitslag voorkom: Verkry mediese hulp.
- Spoel mond uit.
- Maak produk bymekaar wat gemors / uitgeloop het.
- Indien velirritasie voorkom: Verkry mediese hulp.
- Verwyder besmette klere en was voor hergebruik.
- Indien oogirritasie voortduur: Verkry mediese hulp.
- Berg in 'n goed geventileerde plek. Hou die houer dig toe.
- Stoor toegesluit.
- Raak ontslae van inhoud en houer deur na 'n gevaarlike-of spesiale-afval insamelingsplek te besorg.

RELEVANTE STOWWE

Gevaarlike bestanddele Volgens UN GHS kriteria	CAS nommer	Konsentrasie (W/W)
dimethenamid-P	163515-14-8	64 %
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified; [A complex combination of hydrocarbons obtained from distillation of aromatic streams. It consists predominantly of aromatic hydrocarbons having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of approximately 165 °C to 290 °C (330 °F to 554 °F).]	64742-94-5	< 30 %
2-Methylnaphthalene	91-57-6	< 15 %
1-Methylnaphthalene	90-12-0	< 10 %
POE (6) Tridecyl ether phosphate, reaction product with POE (5) soya amine		< 10 %
Oxirane, methyl-, polymer with oxirane, monobutyl ether	9038-95-3	< 5 %
Biphenyl	92-52-4	< 3 %

NOODHULPBEHANDELING

Noodhulppersoneel moet aandag gee aan hul eie veiligheid. As die pasiënt waarskynlik bewusloos sal raak, plaas en vervoer in 'n stabiele sywaartse posisie (herstelposisie). Verwyder onmiddellik besmette klere.

INDIEN IN DIE OË:	Spoel aangetaste oë dadelik vir ten minste 15 minute met lopende water uit terwyl die ooglede oopgehou word, raadpleeg 'n oogspesialis.
INDIEN INGESLUK:	Spoel mond dadelik uit en drink 200 – 300 ml water, kry mediese hulp.
INDIEN OP DIE VEL:	Was deeglik met seep en water.
INDIEN INGEASEM:	Hou pasiënt kalm, verwyder na vars lug, kry mediese hulp.

- Dra rubberhandskoene en -stewels en gesigskerm en oorpak, wanneer konsentraat hanteer word en terwyl gespuut word.
- **SPOEL LEË HOUER DRIE KEER AS VOLG:** Keer die leë houer oor die spuit of mengtenk om en dreineer vir minstens 30 sekondes nadat die vloei tot 'n gedrup verminder het. Spoel daarna die leë houer drie keer na mekaar met een kwart van die houervolume vars water en giet die spoelwater in die spuitenk of mengtenk oor Kap gate in die drie keer gespoelde houer waarna dit aan 'n goedgekeurde versamelaar of verwerker oorhandig moet word (www.croplife.co.za) Moet nie die houer begrawe, verbrand of aan enige ander partye skenk wat dit as houer vir voedsel of drinkgoed mag gebruik nie.
- Maak spuittoerusting skoon na gebruik.
- Raak van die spoelwater ontslae, waar dit nie ander gewasse, weiding, riviere en damme sal besoedel nie.

BEHANDELING: Behandel volgens simptome (dekontaminasie, lewensbelangrike funksies), geen bekende spesifieke teenmiddel nie.

GEBRUIKSBEPERKINGS

- Verhoed die wegdrywing van spuitnewel op gewenste plantegroei en nie-teiken areas.
- Verhoed wegdrywing van spuitnewel na damme, riviere, weiding of ander gewasse of gebiede wat nie behandel word nie.
- Vermoer oorfleueling van spuitbane.

ONTHOUDINGSPERIODE

- Daar is geen beperking vir opvolggewasse, waar 'n land wat met **Frontier[®] Optima** behandel was, en onder normale landboupraktyk geoes is nie.
- Wanneer daar, as gevolg van weersomstandighede, gewasskade voorkom en die land was met **Frontier[®] Optima** behandel, kan lande onmiddellik weer herplant word met enige gewas geregistreer met **Frontier[®] Optima**. Gedurende sulke omstandighede moet daar staat gemaak word op na-opkomsruidbeheer.
- Wanneer **Frontier[®] Optima** tesame met 'n ander onkruidoder toegedien is, moet na die spesifieke etiket van daardie onkruidoder verwys word.

WAARSKUWING TEEN WEERSTAND

Frontier[®] Optima is van die chloroacetamide groep van onkruidodders. Die metode van werking van hierdie groep is primêr die onderdrukking van selverdeling en word dus geklassifiseer deur HRAC as 'n Groepkode 15 onkruidoder.

Die voorkoms van sekere onkruidbiotipes, wat natuurlik bestand is teen **Frontier[®] Optima** en ander onderdrukkende selverdelende onkruidodders, mag bestaan as gevolg van normale genetiese variasie in enige onkruidpopulasie. Hierdie weerstandbiedende individue kan uiteindelik die onkruidpopulasie domineer, as hierdie groep onkruidodders herhaaldelik gebruik word. Hierdie bestande onkruide sal nie deur **Frontier[®] Optima** beheer word nie en waarskynlik ook nie deur ander onkruidodders wat selverdeling verhoed nie.

Aangesien dit moeilik is om te bepaal of hierdie bestande onkruide teenwoordig is voor die onkruidoder toediening, is dit van die uiterste belang dat behandelde areas gereeld geïnspekteer word, om hierdie bestande onkruide betyds te identifiseer. **BASF SA (Edms) Bpk** neem geen aanspreeklikheid vir prestasie mislukking in die geval van die opbou van bestande onkruide, as gevolg van onvoldoende weerstandbiedendheidsbestuur nie.

Om weerstandbiedendheid te vertraag:

- Vermoer uitsluitlike, heraaldeike gebruik van onkruidodders van dieselfde Groepkode.
- Integreer ander beheermaatreëls (afwisselende chemie, verbouing, wisselbou, biologies), in onkruidoderprogramme.

VIR SPESIFIEKE INLIGTING OOR WEERSTANDSBESTUUR, KONTAK U PLAASLIKE BASF SA (Edms) Bpk, VERTEENWOORDIGER.

GEBRUIKSAANWYSINGS: GEBRUIK SLEGS SOOS VOORGESKRYF

KENNISGEWING AAN GEBRUIKER: Hierdie landboumiddel moet slegs volgens die instruksies op die etiket gebruik word. Dit is 'n oortreding ingevolge Wet No. 36 van 1947 om hierdie landboumiddel vir enige ander doel te gebruik op 'n wyse wat strydig is met die aanwysings op die etiket.

Algemene inligting:

- **Frontier[®] Optima** is 'n vooropkoms-, breëspektrumonkruidoder, vir die beheer van eenjarige grasse en -breëblaar onkruide (soos aangedui) en onder sekere omstandighede ook geeluintjies.
- Die opname area van die onkruide van **Frontier[®] Optima**, is deur die koleoptiel in monokotiele plante (grasse) en deur die hipokotiel en ontwikkelende wortels in dikotiele plante (breëblaar plante). Opname geskied tussen ontkieming van die saad en die opkoms van die saailing deur die grond.
- Toedieningstyd moet daarom betyds geskied, om die **Frontier[®] Optima** 'n kans te gee om die grondvog (aktivering) en die teikengebied te bereik, voor die opkoms van die onkruide.
- Reën of besproeiing is noodsaaklik voor die onkruide opkom, om die onkruidoder te aktiveer.
- Laat toedienings of aktivering, of toedienings nadat die onkruide reeds opgekom het, sal grootliks verlaagde effektiwiteit veroorsaak.

Verenigbaarheid:

Frontier[®] Optima is verenigbaar met:

- Geregistreerde atrazine 500 g/g SC formulasies.
 - **Hammer[®] (L5201)**, verwys na die **Hammer[®]** etiket vir verdere inligting.
 - **Gesaprim Super[®] 600 SC (L3914)**.
- Verwys altyd na die betrokke produk-etiket.
Die verenigbaarheid van ander / alternatiewe formulasies as hierbo genoem, is onbekend.

Menginstruksies:

- Vul die spuitnekk drie kwart vol met skoon water. Skud die Skud die **Frontier[®] Optima** houër goed voor gebruik.
- Meet die verlangde volume van **Frontier[®] Optima** af en meng dit vooraf met met ten minste 10 l water, voordat dit

by die tenk gevoeg word. voordat dit by die tenk gevoeg word.

- Vul die tenk met water tot by die verlangde vlak, terwyl daar voortdurend geroer word, om deeglike vermenging te verseker, alvorens daar met toediening begin word.
- Indien enige ander produk saam met **Frontier® Optima** gemeng word, moet dit vooraf eers tot die verlangde volume van elke produk, op dieselfde manier gemeng word.
- Wanneer **Frontier® Optima** as 'n tenkmengsel, met 'n onkruidodder wat 'n SC of WG formulase is, gebruik word, moet hierdie ander produkte eerste in die water gegooi word.
- Verseker dat die spuitoplossing voortdurend, gedurende vermenging en bespuiting, geroer word.
- Aangemaakte spuitmengsels moenie in die spuittenk gelaat word vir 'n onbepaalde tyd, bv. oornag, nie.

TOEDIENINGSINSTRUKSIES

Grondtoediening:

- **Frontier® Optima** kan, of algeheel toegedien word in 'n minimum van 200 l water/hektaar, of as 'n bandoediening, met dienoreenkomsig die hoeveelheid water per bespuitte hektaar gebruik word.
- Enige medium- of hoë volume trekker gemonteerde bespuitingsapparaat kan gebruik word, solank dit korrek gekalibreer is en 'n effektiewe tenkroeringsapparaat besit.
- Platwaaiër spuitkoppe moet aan die spuitbalk gemonteer word, om 'n eweredige en egalige verspreiding van die onkruidodder op die grondoppervlak te verseker.

Lugtoediening:

Verhoog alle voorgeskrewe dosisse met 10% vir lugtoediening.

Frontier® Optima kan slegs deur 'n geregistreerde lugbespuitingsoperateur met 'n korrek gekalibreerde, geregistreerde vliegtuig volgens die instruksies van SANS Kode 10118 (Aerial Application of Agricultural Pesticides) uit die lug bespuit word. Verseker dat die spuitmengsel eweredig oor die teikenarea versprei word, en die verlies aan spuitmengsel tydens toediening tot 'n minimum beperk word. Dit is daarom belangrik om aan die volgende vereistes te voldoen:

- **Volume:** 'n Spuitmengselvolume van 30 'n Spuitmengselvolume van 30 l per ha word aanbeveel. Hierdie produk is nie teen 'n verlaagde volume getoets nie. Die registrasiehouer kan nie effektiwiteit waarborg, of verantwoordelik gehou word vir enige nadelige effekte indien hierdie produk teen 'n laer volume, as hierbo aanbeveel, toegedien word nie.
- **Druppelbedekking:** 20 – 30 druppels per cm² moet op die teikenarea herwin word.
- **Druppelgrootte:** 'n Druppelspektrum met 'n VMD van 350 – 400 mikron word aanbeveel. Beperk die produksie van druppels kleiner as 150 mikron (hoë drywing en verdampingspotensiaal) tot 'n minimum.'n

Druppelspektrum met 'n VMD van 350 – 400 mikron word aanbeveel. Beperk die produksie van druppels kleiner as 150 mikron (hoë drywing en verdampingspotensiaal) tot 'n minimum.

- **Vlieghoogte:** Handhaaf die hoogte van die spuitbalk bo die teiken op 3 – 4 meter. Moenie spuit wanneer die vliegtuig duik, uitklim of draai nie.
- Gebruik geskikte **atomiseringsapparaat** wat die vereiste druppelgrootte en bedekking sal produseer, maar die minste verlies van produk verseker. Die spuitstelsel moet 'n druppelspektrum met die kleinste moontlike Relatiewe Span produseer.
- Plaas al die atomiseerders in die binneste 60 – 75% van die vierkantspan om te verhoed dat druppels binne-in die **vlerventvorteks** beweeg.
- Die verskil in **temperatuur** tussen die nat- en droëboltermometer van 'n swaaihiogrameter, moenie 8°C oorskry nie.
- Stop bespuiting indien die **windspoed** 15 km/uur oorskry.
- Stop bespuiting tydens **turbulente**, onstabiele en droë toestande gedurende die hitte van die dag.
- Bespuiting, onder temperatuur **inversie toestande** (deur bo of binne die inversie laag te spuit) en / of hoë **luggvoeg toestande** (relatiewe humiditeit 80% en meer) mag tot volgende probleme aanleiding gee:
 - Verlaagde effektiwiteit aangesien die druppels as 'n wolk in die lug bly hang en moontlik verdamp (onvoldoende bedekking op teiken).
 - Skade aan nie-teiken gewasse of sensitiewe areas as gevolg van wegdrywing van die spuitwolk na nie-teiken areas.
- Verseker dat die lugbespuitingsoperateur presies weet wat lande bespuit moet word.
- Dit is noodsaaklik om 'n versekering van die lugbespuitingsoperateur te verkry dat aan al die bogenoemde vereistes voldoen sal word en dat data van belang in 'n logboek saamgevat is vir toekomstige verwysing.

Spilpuntoediening:

Frontier® Optima mag deur 'n spilpunt toegedien word, in ooreenstemming met die **TOEDIENINGSDOSISSE EN VOORSKRIFTE** soos aangedui hieronder en sorg moet gedra word dat die volgende voorwaardes nagekom word.

- Gebruik slegs 'n spilpunt wat water egalig toedien.
- Gebruik slegs inspuitpompe wat akkuraat gekalibreer kan word.
- Dien in 'n maksimum van 10 mm water toe. **Moenie hierdie watervolume oorskrei nie.**
- Voldoende roering moet deurentyd gehandhaaf word, om die onkruidodder in suspensie te hou.
- Die spilpunt moet oor 'n antihewingsstelsel en -kleppe beskik, wat besoedeling terug na die waterbron sal verhoed gedurende afsluiting, of oorloop van die vermengingstenk.

- Spuit die mengsel voor enige reghoekige draai op die hoofwaterlyn in, om voldoende vermenging met die besproeiingswater te verseker.
- Chemiese inspuitspomp en waterpompe moet gelyktydig afgeskakel kan word.
- Toediening in windrige toestande kan lei tot spuitnewel wegdrywing, wat vermy moet word. Lekplekke in die sisteem en onegalige toediening, mag skade aan die gewas veroorsaak.
- Spuitpatrone wat nie voldoende oorvleuel nie, kan lei tot swak onkruidbeheer. Oormatige oorvleueling kan egter tot gewasbeskadiging lei.

Metode: Berei 'n mengsel van 'n minimum van een deel onkruidodder met een deel water voor en spuit hierdie mengsel met 'n positiese verplasende pomp in die spilpuntsisteem in. Deur die inspuiting van 'n groter volume (meer verdunde mengsel per uur), kan 'n meer akkurate kalibrasie van die inspuitpomsisteem verkry word.

Waaskuwing: As gevolg van holtes en oneweredige grondoppervlakte mag spilpuntoedienings peele water teweegbring. Indien dit direk oor die gewassaailinge gebeur, sal skade voorkom. Dien op 'n egalige land toe.

Tabel 1. Toedieningsdosisse op aartappels.

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
AARTAPPELS	0 – 10	0,4 – 0,5	Dien na operting toe. Gebruik die laer dosis, slegs vir eenjarige grasbeheer. Gebruik die hoër dosis, wanneer geeluintjies en / of breekblaaronkruid 'n probleem is.
	11 – 20	0,5 – 0,7	
	21 – 30	0,7 – 0,9	
	31 – 40	0,9 – 1,2	
NB: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.			

Tabel 2. Toedieningsdosisse vir droëbone, nierbone en sojabone

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
DROËBONE, NIERBONE EN SOJABONE	11 – 20	0,5 – 0,75	Gebruik die laer dosis, slegs vir eenjarige grasbeheer. Gebruik die hoër dosis, wanneer geeluintjies en / of breekblaaronkruid 'n probleem is.
	21 – 30	0,75 – 1,0	
	31 – 40	1,0 – 1,25	

WAARSKUWING

Moenie **Frontier® Optima** op droëbone, nierbone of sojabone toedien, waar die klei-inhoud laer is as 10% is nie, daar dit onder sekere klimaatstoestande gewasskade mag veroorsaak.

LW: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.

Tabel 3. Toedieningsdosisse vir graansorghum.

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
GRAANSORGHUM	0 – 20	0,4 – 0,7	Gebruik die laer dosis, slegs vir eenjarige grasbeheer. Gebruik die hoër dosis, wanneer geeluintjies en / of breekblaaronkruid 'n probleem is.
	21 – 30	0,7 – 0,9	
	31 – 40	0,9 – 1,2	
	>40	1,2	

WAARSKUWING

BASF SA (Edms) Bpk aanvaar geen aanspreeklikheid vir skade aan kultivars, wat nie op hierdie etiket verskyn nie.

Frontier® Optima word slegs op die volgende graansorghum kultivars aanbeveel en sade wat behandel is met **Concept® (L5051)**.

Die effek van **Frontier® Optima** op ander kultivars, is onbekend.

CRN 7610	PAN 8509	PAN 8591	NK 283	SNK 3727	CRN 7611	PAN 8560
NK 222	NK 286	VS 881	DC 75	PAN 8564	NK 280W	NK 304
LW: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.						

Tabel 4. Toedieningsdosisse vir grondboontjies.

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
GRONDBONE	0 – 10	0,5	Gebruik die laer dosis, slegs vir eenjarige grasbeheer. Gebruik die hoër dosis, wanneer geeluintjies en / of breekblaaronkruid 'n probleem is.
	11 – 20	0,5 – 0,75	
	21 – 30	0,75 – 1,0	
	31 – 40	1,0 – 1,25	
WAARSKUWING			
Toediening van Frontier® Optima op grondbone, waar die klei-inhoud laer is as 10%, mag, onder sekere klimaatstoestande, gewasskade veroorsaak.			
LW: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.			

Tabel 5. Toedieningsdosisse vir mielies.

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
MIELIES	0 – 10	0,5	Gebruik die laer dosis, slegs vir eenjarige grasbeheer.
	11 – 20	0,5 – 0,75	
	21 – 30	0,75 – 1,0	Gebruik die hoër dosis, wanneer geelintjies en / of breëblaaronkruid 'n probleem is.
	31 – 40	1,0 – 1,25	
	>40	1,25	

Vooropkoms-onkruidbeheer met Frontier® Optima alleen:

- Waar breëblaaronkruid nie 'n groot probleem is nie, mag **Frontier® Optima** alleen toegedien word.

Vooropkoms-onkruidbeheer met Frontier® Optima in tenkmengsels (alle grondtipes):

- Waar breëblaaronkruid 'n groot probleem is, word die volgende tenkmengsels aanbeveel:
- Atrazine 500 SC of Gesaprim Super® 600 SC teen 1 – 2 l/ha.
- Toedienings mag later gespuit word, op voorwaarde, dat dit 'n gerigte bespuiting is en voor die opkoms van die onkruid (bv. na 'n skoffel). Onkruid wat alreeds opgekrom het ten tye van toediening, sal nie beheer word nie.

Voor-opkoms van onkruid, na opkoms van die gewas:

- **Frontier® Optima** kan na-opkoms van die gewas aangewend word as 'n residuele onkruiddoderbehandeling met 'n gerigte tussenryspuiting voordat die mielie gewas die BBCH 31 (met eerste node sigbaar bo die grond) groeistadium bereik.
- Onkruid wat reeds ontkiem het op die tystyp van toediening, sal nie deur **Frontier® Optima** beheer word nie.
- Onder sekere omstandighede, veral wanneer bykomende hulpmiddels gebruik word, mag toedienings oor die gewas ná die BBCH 31 groeistadium lei tot skade binne die roset van die plant. Daar mag ook sekondêre infeksie van swamme en bakterieë volg, wat kan lei tot oesverlies.

LW: Frontier® Optima mag op suikermielies en springmielies toegedien word.

- Indien 'n tenkmengsel gebruik word, verseker dat die bygevoegde produk ook geregistreer is op springmielies en suikermielies.

Vir laatontkiemende onkruid, is die volgende produkte vir na-opkoms geregistreer:

- **Basagran®** (L2916)
- of **Basagran®** plus Atrazine 500 g/l.
- **Stellar® Star** (L9391)
- **Campus®** (L8521)

Verwys na die onderskeie produketikette.

LW: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.

Tabel 6. Toedieningsdosisse op tabak.

GEWAS	% KLEI	Dosis l/ha	GEBRUIKSAANBEVELINGS
TABAK	0 – 20	0,7	Slegs sterk gesonde plantjies moet uitgeplant word, met die wortels goed onder die grondoppervlak geplaas. Moenie Frontier® Optima op saailaaiplantjies gebruik nie.
	21 – 30	1,0	
	31 – 40	1,2	

Metode en tyd van toediening in tabak:

- Dien **Frontier® Optima** toe, as 'n algehele oppervlakbespuiting, binne drie dae na uitplant van die tabak, terwyl die plantjies nog verlep is.
- Waar tabak op walle geplant word, moet van 110° spuitpunte gebruik gemaak word, vanaf 'n posisie tussen die walle. Dit sal 'n meer egalige verspreiding van die onkruiddoder tot gevolg hê.
- Binne 3 – 4 dae na die toediening van **Frontier® Optima**, moet sprinkelbesproeiing (nie meer as 15 mm nie) toegedien word, om die produk te aktiveer, maar uitwassing verhoed.
- **OONDGROEGDE TABAK** – Vir die beheer van *Cyperus rotundus*, asook vir verbeterde beheer van *Cyperus esculentus* en breëblaaronkruid, kan Authority 75 WG (L6262) direk na die **Frontier® Optima** toegedien word. **Onder geen omstandighede mag Authority® 75 WG en Frontier® Optima saam**, in 'n tenkmengsel, toegedien word nie. Raadpleeg die toepaslike Authority® 75 WG etiket.

WAARSKUWINGS

- Na **Frontier® Optima** toediening op tabak, mag 'n ligte verkleuring van die sandblare en / of verdwering opgemerk word. Dit is egter van 'n verbygaande aard en behoort nie 'n negatiewe effek op oesopbrengs te hê nie. Nogtans moet sekere voorsorgmaatreëls nagekom word, aangesien die moontlikheid van skade onder die volgende omstandighede verhoog word:
- Wanneer swak en / of beskadigde, of siek plante uitgeplant word;
 - wanneer tabakplantjies onsoorgvuldig uitgeplant word, met die wortels boontoe gekrul of wanneer die wortels tydens toediening aan die onkruiddoder blootgestel word;
 - wanneer tabak in klipperige of gruiserige grond uitgeplant is;
 - wanneer meer as 15 mm reën of besproeiing kort na uitplant plaasvind;
 - wanneer behandelde grond met die wortels van inboetplantjies in kontak kom;
 - wanneer plantjies korter as 150 mm is;
 - wanneer toegedien word bo-oor haalbeskadigde tabakplante.

LW: VERWYS OOK NA GEBRUIKSBEPERKINGS, WEERSTANDBIEDENDHEIDSWAARSKUWING, GEBRUIKSAANWYSINGS EN BELANGRIKE NOTAS.

Belangrike notas

1. **Frontier® Optima** moet, met of na plant, maar voor onkruidopkoms, toegedien word.

2. Wanneer in **klam grond** geplant word, moet **Frontier® Optima** binne drie dae na plant (maar verkieslik tydens plant), op 'n relatiewe fyn, egalige, ferm en vars voorbereide, onkruidvrye saadbed, toegedien word. **Nie meer as drie dae moet verstryk tussen bewerking en toediening nie.**

- Om goeie resultate te verkry, is dit noodsaaklik dat die onkruidodertoediening opgevolg moet word deur 10 – 15 mm reën of sprinkelbesproeiing, voordat die onkruid opkom.
- Indien reën nie betyds val nie, sal ontkiemende onkruid verpot wees, wat maklik beheer kan word met 'n vlak grondbewerking, wat terselfdertyd die onkruidodder sal meng met die boonste 10 – 20 mm grond.
- 'n Diep bewerking moet vermy word, want dit sal die produk in die grond verdun en kan onbehandelde grond na die oppervlak bring, wat tot swak onkruidbeheer mag lei.'

3. Wanneer in droë grond geplant word (onvoldoende vog vir ontkieming), moet **Frontier® Optima** so na as moontlik aan, maar beslis voor, die eerste reën toegedien word. Onkruid wat reeds opgekom het met toediening, sal nie beheer word nie.

- Onder droë toestande, sal 'n vlak inkorporering van die produk – nie dieper as 10 – 20 mm nie – effektiwiteit verbeter.
- 'n Diep bewerking moet vermy word, want dit sal die produk in die grond verdun en kan onbehandelde grond na die oppervlak bring, wat tot swak onkruidbeheer mag lei.

4. Grondverplasing:

- Op ligte sanderige gronde van 0 – 10% klei (bv. sekere bogronde in Noordwes Provinsie, noordwes Vrystaat en Noord Kaap), sal onkruidbeheer verswak word, indien sterk winde die behandelde bogrond wegwaai, nadat **Frontier® Optima** toegedien is.
- Onkruidbeheer mag ook verswak word, indien swaar reëns die bogrond wat **Frontier® Optima** bevat, wegspoel.
- Toediening op 'n swak voorbereide saadbed met kluite op die grondoppervlak, sal 'n verlaagde effektiwiteit veroorsaak.
- Waar 'n gewas in vore geplant is en reën verplaas die behandelde grond vanaf die kante van die sloot in 'n gekonsentreerde laag direk bo-oor die geplante sade, mag gewasskade voorkom.

5. Minimum- of geen bewerkingsituasies:

Aangesien plantreste op die grondoppervlak onkruidodderopname in die grondprofiel benadeel, behoort die hoër dosis vir die toepaslike grondtipe, beter resultate te lewer.

6. **Langdurige koel- en nat weerstoestande**, oormatige besproeiing, infeksie van saad of jong saailinge deur

grond- of saadgedraagde siektes, sade te diep of te vlak geplant ens., mag lei tot oesgewasskade. Waar toepaslik, moet sade dus verkieslik behandel word met 'n gepaste swamdodersaadbehandeling.

7. Moenie Frontier® Optima onder die volgende toestande toedien nie, aangesien gewasbeskadiging mag voorkom:

- Op swak gedreineerde grond, grond met 'n verdigtingslaag, of grond met 'n voedingsgebrek.
- Op ingeteelde ouerplante van meliebasters, proef- of nuut-vrygestelde kultivars van al die **Frontier® Optima** geregistreerde gewasse, insluitende saadproduksie van enige **Frontier® Optima** geregistreerde gewasse, sonder om eers die verspreider of vervaardiger te raadpleeg nie.
- Gewasskade kan ook verwag word, waar die grond vasslaan voor die saailinge opkom, of as saadontkieming vertraag is.

Die volgende onkruidspesies word normaalweg deur 'n vooropkomstoediening van **Frontier® Optima** beheer, teen die aangeeude dosis.

GRASSES			
<i>Brachiaria eruciformis</i>	Litjiesinjalgras	<i>Panicum maximum</i>	Gewone Buffelsgras
<i>Digitaria sanguinalis</i>	Kruisvingergras	<i>Panicum schinzii</i>	Soet Buffelsgras
<i>Digitaria ciliaris</i>	Tropiese vingergras	<i>Setaria faberi</i>	Sjineseborselgras
<i>Echinochloa crus-galli</i>	Hanepootmanna	<i>Setaria pallide-fusca</i>	Rooi borselgras
<i>Eleusine corocana</i>	Jongosgras	<i>Setaria verticillata</i>	Klitsborselgras
		<i>Urochloa panicoides</i>	Beesgras

BREËBLARE			
<i>Amaranthus deflexus</i>	Meerjarige misbredie	¹ <i>Datura stramonium</i>	Stinkblaar
<i>Amaranthus hybridus</i>	Gewone misbredie	<i>Galinsoga parviflora</i>	Knopkruid
<i>Amaranthus spinosus</i>	Doringmisbredie	<i>Nicandra physaloides</i>	Basterappelliefie
¹ <i>Bidens pilosa</i>	Knapsekêrel	<i>Portulaca oleracea</i>	Porslein
¹ <i>Chenopodium album</i>	Wit hondebossie	<i>Richardia brasiliensis</i>	Tropiese Richardia
<i>Cleome monophylla</i>	Rusperbossie	<i>Schkuhria pinnata</i>	Kleinkakiebos
¹ <i>Commelina benghalensis</i>	Bengaalse wandelende Jood	¹ <i>Tagetes minuta</i>	Kakiebos
¹ <i>Crotalaria sphaerocarpa</i>	Wilde lusern	¹ <i>Tribulus terrestris</i>	Dubbeltjie
¹ <i>Datura ferox</i>	Grootolieboom	<i>Xanthium Strumarium</i>	Kankerroos
¹ Beheer van hierdie onkruid is wisselvallig. Laat- en diep ontkiemers word nie heeltemal beheer nie.			

UINTJIES			
<i>Cyperus esculentus</i>	Geeluintjie		

Die beheer van geeluintjies kan verbeter word, deur aan die volgende voorwaardes te voldoen:

- Die plantproses moet onmiddellik voorafgegaan word deur 'n deeglike bewerking met 'n skaarploeg.
- 'n Relatiewe fyn, egalige en ferm saadbed voorberei is.
- Die onkruidodertoeidinge word minstens 10 – 15 mm sagte deurdringende reën (of besproeiing), gevolg word, om die onkruidodder in die grond in te was, voordat die geeluintjies opkom (gewoonlik 7 – 10 dae na die deeglike grondbewerking). Meer reën is nodig op swaarder grond, vir goeie resultate. Onvoldoende vog is dikwels die rede waarom swak beheer op turfgronde verkry word.
- Wanneer in klam grond geplant word, moet **Frontier® Optima** tydens, of onmiddellik na die plantproses toegedien word, om onkruidodder aktivering ,voor die opkoms van die geeluintjies te verseker.
- Wanneer in droë grond geplant word (onvoldoende vog om geeluintjies te laat ontkiem), moet die toediening van **Frontier® Optima** uitgestel word, tot so na as moontlik aan, maar beslis voor, die eerste reën.

Ander plant spesies, wat nie voorgekom het tydens die ontwikkelingsproewe met die middel nie, kan ook moontlik in mindere of meerdere mate beheer word. Die registrasiehouer aanvaar egter geen aanspreeklikheid ten opsigte van ongelyste onkruid nie.

VERKOOPVOORWAARDES EN WAARBORG

Die **GEBRUIKSAANWYSINGS** van hierdie produk weerspieël die opinie van kundiges, gebaseer op gebruik in die veld en in proewe. Die aanwysings word as betroubaar geag en moet noukeurig nagekom word. Dit is egter onmoontlik om alle risiko's wat inherent met die gebruik van hierdie produk geassosieer word, uit te skakel. Gewasskade, oneffektiwiteit of ander onopsetlike gevolge mag voorkom as gevolg van faktore soos weerstoestand, teenwoordigheid van ander materiale, of wanneer die produk op 'n wyse wat teenstrydig met die etiket is, gebruik word; dit alles is buite die beheer van BASF Suid-Afrika (Edms) Bpk ("BASF") of die Verkoep. In die mate waarin dit in ooreenstemming met toepaslike wetgewing is, sal alle risiko's deur die Koper aanvaar word.

BASF waarborg dat hierdie produk aan die vereistes van die chemiese beskrywing op die etiket voldoen, en is redelikerwys geskik vir die gebruikdoeleindes soos uiteengesit in die **GEBRUIKSAANWYSINGS**, onderhewig aan die inherente risiko's, soos hierbo na verwys.

IN DIE MATE WAT DIT MET TOEPASLIKE WETGEWING OOREENSTEM, GEE BASF GEEN ANDER UITDRUKKING OF GEÏMPLISEERDE WAARBORG VAN GESKIKTHEID OF VERKOOPVERNUF OF ENIGE ANDER UITDRUKKING OF GEÏMPLISEERDE WAARBORG NIE.

IN DIE MATE WAT DIT MET TOEPASLIKE WETGEWING OOREENSTEM, SAL DIE KOPER SE UITSLUITLIKE REGSMIDDEL EN BASF SE UITSLUITLIKE AANSPREEKLIKHEID, HETSY IN KONTRAK, ONREGMATIGHEID, NALATIGHEID, STRENG AANSPREEKLIKHEID, OF ANDERSINDS, BEPERK WORD TOT TERUGBETALING VAN DIE AANKOOPPRYS VAN DIE PRODUK.

IN DIE MATE WAT DIT MET TOEPASLIKE WETGEWING OOREENSTEM, DOEN BASF EN DIE VERKOPER, AFSTAND VAN ENIGE AANSPREEKLIKHEID TEN OPSIGTE VAN VOORTSPRUITENDE SKADE, SKADEVERGOEDING, SPESIALE OF INDIREKTE SKADE, UIT DIE GEBRUIK OF HANTERING VAN HIERDIE PRODUK.

BASF en die Verkoep bied hierdie produk aan, en die Aankoper en Gebruiker aanvaar dit, onderhewig aan die voorafgaande Verkoopvoorwaardes en Waarborg, wat slegs gewysig mag word deur 'n skriftelike ooreenkoms, wat na behore deur 'n gemagtigde verteenwoordiger van BASF onderteken is.

Basagran®, Hammer®, Stellar® en **Campus®** is Geregistreerde Handelsmerke van BASF.

Concept® III 964 EC is 'n Geregistreerde Handelsmerk van Syngenta Suid-Afrika (Edms) Bpk.

Gesaprim® Super 600 SC is 'n Geregistreerde Handelsmerk van Syngenta Suid-Afrika (Edms) Bpk.

Authority 75 WG is 'n Geregistreerde Handelsmerk van FMC Suid-Afrika (Edms) Bpk.

Frontier® Optima

Reg. No. L7011; N-AR 0803

Act No. 36 of 1947

**READ ATTACHED PACKAGE LEAFLET BEFORE USE
KEEP OUT OF REACH OF CHILDREN AND ANIMALS**

GROUP	15	HERBICIDE
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An emulsifiable concentrate pre-emergent herbicide, for control of annual grasses and annual broadleaf weeds (as indicated), and under certain conditions also yellow nutsedge, in dry beans, grain sorghum, groundnuts, kidney beans, maize, potatoes, soya beans and tobacco.

'n Emulgeerbare konsentraat voor-opkomsnkruidoder, vir die beheer van eenjarige grasse en eenjarige breëblaaronkruid (soos aangetoon), en onder sekere omstandighede ook geeluintjies, in aartappels, droëbone, graansorghum, grondbone, mielies, nierbone, sojabone en tabak.

Hazard statements:

- Causes serious eye irritation.
- Causes skin irritation.
- Harmful if swallowed.
- May cause an allergic skin reaction.
- May cause respiratory irritation.
- Very toxic to aquatic life with long lasting effects.

Precautionary statements:

- Wear protective gloves and eye protection or face protection.
- Avoid breathing mist or vapour or spray.

Active ingredients / Aktiewe bestanddele:

Dimethenamid-P (chloroacetamide).....720 g/l

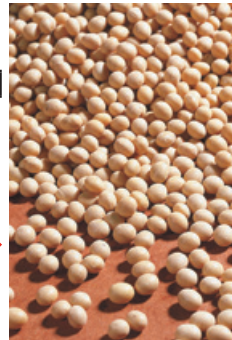
Registered by:

BASF South Africa (Pty) Ltd, Co. Reg. No. 66/10235/07, 852 Sixteenth Road, P.O. Box 2801, Halfway House 1685, +27 11 203 2400

Batch No. & Date manufactured: Refer to details printed on container
Lotnommer & Datum vervaardig: Verwys na besonderhede gedruk op houër

UN-No. / VN-Nr: 3082

EMERGENCY NUMBERS +27 82 446 8946 or +27 11 203 2420
In case of poisoning, call the following number: +27 861 555 777



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