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# Frontier® Optima

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



NET VOLUME:

1 L

GROUP	K3	HERBICIDE
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**Active ingredients:**  
Dimethenamid-P 720 g/L

## HAZARD STATEMENT

Causes serious eye irritation.  
Causes skin irritation.  
Harmful if swallowed.  
Very toxic to aquatic life with long lasting effects.

## PRECAUTIONARY STATEMENTS

Wear protective gloves and eye/face protection.  
Do not breathe mist or vapour.  
Take off contaminated clothing and wash before reuse.

### Imported by:

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### Manufactured by:

BASF Group  
Headquarter: 67056 Ludwigshafen, Germany  
International Emergency Number: +49 180 2273 122

**ZEMA PRODUCT NUMBER: .**



® = Registered trademark of BASF



**WARNING**



81134210 ZM 1049

## READ THE LABEL BEFORE USING THE PRODUCT

**WARRANTY:** 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 climatic- and storage conditions; quality of dilution water, compatibility with other substances not indicated on the label and the occurrence of resistance of the disease, weed or pest, 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 failure of the user to follow the label instructions or the occurrence of conditions which could not have been foreseen in terms of the registration. Consult the supplier in the event of any uncertainty.

### WARNINGS:

- Harmful when swallowed.
- 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.
- Irritating to eyes and skin; avoid contact, ingestion and inhalation.
- May cause sensitization in contact with skin.
- Toxic to fish.
- 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.

### PRECAUTIONS:

- Wear suitable protective clothing and face shield when handling the concentrate.
- Do not inhale spray mist.
- Wash contaminated clothing after use.
- Wash with soap and water after use.
- Do not eat, drink or smoke whilst mixing or applying the product or before washing hands and face.
- Avoid spray drift onto other crops, grazing, rivers, dams and areas not under treatment.
- Clean applicator after use. Dispose of wash water where it will not contaminate crops, grazing, rivers, dams etc.
- Triple rinse empty container in the following manner: Invert the empty container over the spray or mixing tank and allow to drain for at least 30 seconds after the flow has slowed down to a drip. Thereafter rinse empty container three times with a volume of water equal to a minimum of 10% of that of the container. Add the rinsings to the contents of the spray tank before destroying the container by perforation, flattening and burying, and never re-use for any other purpose.
- Prevent contamination of food, feed, drinking water and eating utensils.

### USE RESTRICTIONS:

- 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 a nutrient deficiency.
- 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.
- On the specified dry-bean and groundnut cultivars as listed in the tables below.

## FIRST AID MEASURES

**General advice:** Avoid contact with the skin, eyes and clothing.

Take off immediately all contaminated clothing.

If difficulties occur: Obtain medical attention.

Show container, label and/or safety data sheet to physician.

**If inhaled:** Keep patient calm, remove to fresh air and seek medical attention.

**On skin contact:** After contact with skin, wash immediately with plenty of water and soap. If irritation develops, seek medical attention.

**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:** Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions.

Rinse mouth immediately and then drink plenty of water, seek medical attention.

**Note to physician:** Treat according to symptoms (decontamination, vital functions), no known specific antidote.

Hazards: When inhaled (e.g. during vomiting) risk of pulmonary oedema and/or pneumonia.

## DIRECTIONS FOR USE: USE ONLY AS DIRECTED

### WITHHOLDING PERIOD:

Following normal harvest of a Frontier® Optima treated crop, 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.

### COMPATIBILITY:

Frontier® Optima may be applied in a tank mix or a sequential application with other herbicides registered for use in a given crop. When using tank mixtures or sequential applications with Frontier® Optima, always read the companion product label(s) and apply each product within label recommendations.

Frontier® Optima is compatible with known Atrazine SC formulations containing 500 g/l active ingredient, Bladex 500, Exazine SL and Gesaprim Super 600 SC, Hammer®, Optill.

Stellar® Star can be applied in a spray sequential program after Frontier® Optima application. Refer to the Stellar® Star label for weeds controlled in addition to Frontier® Optima alone.

### MIXING INSTRUCTIONS:

Half 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 before spraying commences. Maintain agitation while spraying. The prepared spray mixture must not be left in the spray tank for any length of time, e.g. overnight.

### APPLICATION INSTRUCTIONS:

- Frontier® Optima must be applied post-plant, pre-emergence.
- When planting into moist soil, Frontier® Optima must be applied within 3 days after planting (but preferably at planting) onto a fine, even, firm and freshly prepared weed-free seedbed. No more than 3 days should elapse between planting 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. A deep cultivation should be avoided as this may bring untreated soil to the surface that may result in poor weed control.

- 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.

**NOTE: SUFFICIENT RAIN OR IRRIGATION AFTER APPLICATION IS ESSENTIAL TO ENSURE ACTIVATION OF THE HERBICIDE.**

**Soil erosion:** On light sandy soils of 0 – 10% clay in the top soil, weed control will be reduced if strong winds blow away the soil surface after Frontier® Optima has been applied. Weed control may also be reduced if heavy rains erode or wash away the soil surface containing the herbicide.

**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 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 an even distribution of the herbicide on the soil surface.

**Aerial application:** For aerial application, increase all given rates by 10%. Frontier® Optima, can be applied aerially, provided that the spray mixture is distributed evenly over the target area and the loss of spray material during application is restricted to a minimum. To achieve this, it is essential that the following requirements are met:

Use a conventional boom. Nozzles must be equipped with flat fan tips.

Maintain a flying height of three metres above the target area at wind speeds of 0 – 8 km/h or a flying height of two metres at wind speeds of 9 – 15 km/h. Do not spray when the wind speed exceeds 15 km/h.

The difference between the wet and dry bulb reading, as determined with a swing hygrometer, must not exceed 8 °C.

Do not spray during the heat of the day.  
Ensure that fields are accurately marked.

#### APPLICATION RATES:

CROP	% CLAY	DOSAGE L / ha	DIRECTIONS FOR APPLICATION
DRY BEANS	0–10	0.5	Use the lower rate only for control of annual grasses. Use the higher rate if yellow nutsedge and/or broad leaf weeds are a problem.
KIDNEY BEANS	11–20	0.5–0.75	
SOYABEANS	21–30	0.75–1.0	
	31–40	1.0–1.25	

Frontier® Optima can be applied to all currently registered dry-and soyabean cultivars.

**WARNING:** Do not apply Frontier® Optima on the dry bean cultivars, when they are planted in soils with less than 10% clay content and soil and/or climatic conditions are not optimal

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 broad leaf weeds are a problem.
	11–20	0.5–0.75	
	21–30	0.75–1.0	
	31–40	1.0–1.25	

**WARNING:** Do not apply Frontier® Optima on groundnuts, when they are planted in soils with less than 10% clay content:

CROP	% CLAY	DOSAGE L / ha	DIRECTIONS FOR APPLICATION
MAIZE	0–10	0.5	Pre-emergence weed control with Frontier® Optima alone: Where broadleaf weeds are not a major problem, Frontier® Optima may be applied alone. Where applicable, use the lower rate for control of annual grasses. Use the higher rate if yellow nutsedge and/or broadleaf weeds are a problem. An early post-emergence follow-up treatment can be applied (see below). Pre-emergence weed control with Frontier® Optima in tank mixtures (all soil types): Where broadleaf weeds are a major problem it is recommended to tank mix Frontier® Optima with broad leaf herbicide. A follow-up post-emergent treatment of Stellar® star can be applied at 1.0 L/ha for better control of late germinating weeds. NB. Frontier® Optima may be applied on Sweet corn and Popcorn. If using a tank-mix, ensure the partner product is also registered for use on sweet corn and popcorn. Do not apply Frontier® Optima to inbred parent plants of hybrids or to experimental or newly released cultivars.
	11–20	0.5 – 0.75	
	21–30	0.75 – 1.0	
	31–40	1.0 – 1.25	

CROP	% CLAY	DOSAGE L / ha	DIRECTIONS FOR APPLICATION
POTATOES	0–10	0.4 – 0.5	Where applicable, use the lower rate for control of annual grasses. Use the higher rate if yellow nutsedge and/or broad leaf weeds are a problem
	11–20	0.5 – 0.7	
	21–30	0.7 – 0.9	
	31–40	0.9 – 1.2	

#### TOBACCO – GROUND APPLICATION:

##### Warnings:

After 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. Where applicable, use the lower rate for control of annual grasses. Use the higher rate if yellow nutsedge and/or broadleaf weeds are a problem

#### Method and Timing of application in tobacco

- Apply Frontier® Optima as a total surface application within 3 days after transplanting 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 a broad leaf herbicide for broadleaf control, as a sequential spray and not as a tank mix, immediately after application of Frontier® Optima. Consult the respective label of the other products.

CROP	% CLAY	DOSAGE L / ha	DIRECTIONS FOR APPLICATION
TOBACCO	0–10	0.7	Only strong healthy plants should be used with roots well settled into the soil. Do not use Frontier® Optima on tray transplants.
	21–30	1.0	
	31–40	1.2	

Minimum cultivation or no-till situations (all registered crops): Since surface trash may reduce the herbicide penetration into the soil, the higher rate for the relevant soil type will give a better result.

#### WEEDS CONTROLLED:

The following weed species are normally controlled by a pre-emergence application of Frontier® Optima at the dosage rates indicated below.

#### GRASSES:

Scientific Name	Common Name
<i>Brachiaria eruciformis</i>	Sweet signal grass
<i>Digitaria sanguinalis</i>	Crab finger grass
<i>Digitaria ciliaris</i>	Tropical finger grass
<i>Echinochloa crus-galli</i>	Barnyardgrass
<i>Eleusine indica</i>	Goosegrass
<i>Panicum maximum</i>	Common buffalo grass
<i>Panicum schinzii</i>	Sweet Buffalo grass
<i>Setaria faberi</i>	Giant foxtail
<i>Setaria pallidifusca</i>	Red bristle grass
<i>Setaria verticillata</i>	Sticky bristle grass
<i>Urochloa panicoides</i>	Herringbone grass

#### BROAD LEAVES:

Scientific Name	Common Name
<i>Amaranthus hybridus</i>	Smooth pigweed
<i>Amaranthus spinosus</i>	Thorny pigweed
<i>Amaranthus deflexus</i>	Perennial pigweed
<i>Chenopodium album</i>	Common lambsquarters
<i>Cleome monophylla</i>	Spindlepod
<i>Galinsoga parviflora</i>	Gallant soldier
<i>Nicandra physaloides</i>	Apple of Peru
<i>Portulaca oleracea</i>	Common purslane
<i>Richardia brasiliensis</i>	Mexican clover
<i>Schkuhria pinnata</i>	Dwarf marigold

#### CONTROL OF THE FOLLOWING WEEDS IS VARIABLE:

Scientific Name	Common Name
<i>Bidens pilosa</i>	Hairy beggarticks
<i>Commelina benghalensis</i> *	Wandering Jew
<i>Crotalaria sphaerocarpa</i>	Wild lucerne
<i>Cyperus esculentus</i>	Yellow nutsedge
<i>Datura ferox</i> *	Fierce thornapple
<i>Datura stramonium</i> *	Jimson weed
<i>Tagetes minuta</i>	Dwarf marigold
<i>Tribulus terrestris</i> *	Puncturevine
<i>Xanthium strumarium</i> *	Common cocklebur
<i>Schkuhria pinnata</i>	Dwarf marigold

\* N.B. Late and deep germinators not completely controlled.

Other weeds that were not present during the development trials with this product may also be controlled to a certain degree. The registration holder does not accept any responsibility for unlisted weeds.



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NET VOLUME:

1 L

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