BASF

We create chemistry

Hammer®

A water soluble herbicide for the control of annual broadleaf weeds in dry beans, soyabeans and groundnuts.

GROUP	B	HERBICIDE

Active ingredients:
Imazethapyr: 100g/L

HAZARD STATEMENT
Harmful to aquatic life with long lasting effects.
To avoid risks to human health and the environment, comply with the instructions for use. instructions for use.

PRECAUTIONARY STATEMENTS
Dispose of contents/container to hazardous or special waste collection point.

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

ZEMA PRODUCT NUMBER: .

NET VOLUME:

10 L

® = Registered trademark of BASF

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WARNING

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:

- Allow 85 days between application and harvest of the crop.
- Handle with care.
- Poisonous by swallowing.
- Store in a cool place away from food, feeds and seed.
- Keep out of reach of children, uninformed persons and animals.

AERIAL APPLICATION:

Notify all inhabitants of the immediate area to be sprayed and issue the necessary warnings.
Do not spray over or allow drift to contaminate adjacent areas or water bodies.

USE RESTRICTIONS:

- Do not apply Hammer® to acid soils with pH (KCl) below 5.0.
- Do not use the post emergent treatment on soils below 15% clay
- Do not apply more than 700ml/ha Hammer® on a land per season.
- When Hammer® is applied post-emergent to the crop, the crop may be treated at any time after the full emergence of the third trifoliate leaf, but before flowering.
- Avoid the post-emergent application of Hammer® to plants stressed in any way by factors such as drought, nematode infestations, diseases, nutritional deficiencies or plants put under stress by prior use of other herbicides.
- If a deep cultivation is required to aerate the soil before the post-emergence application has been made, Hammer® can be applied immediately after the cultivation or any time up to 14 days after this cultivation, provided the crop has not started flowering. Further shallow cultivations may be carried out.

PRECAUTIONS:

- Do not inhale spray mist.
- Wash with soap and water after use and accidental skin contact.
- Do not eat, drink or smoke while mixing or spraying unless having washed hands and face.
- Do not allow spray drift onto/or spraying of other crops, grazing, rivers, dams and any area not under treatment.

- Do not allow food, feeds tuffs, drinking water and eating utensils to be contaminated.
- 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 the 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.
- Destroy the container by perforation, flattening and burying, and never re-use for any other purpose.
- Wash and rinse spray equipment thoroughly after use and dispose of wash-water where it will not contaminate crops, grazing, rivers and dams.

FOR SPECIFIC INFORMATION ON RESISTANCE MANAGEMENT CONTACT THE REGISTRATION HOLDER.

FIRST AID MEASURES

Remove contaminated clothing and seek medical advice.
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: Wash thoroughly with soap and water.
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: Rinse mouth and then drink plenty of water.
Note to physician: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

DIRECTIONS FOR USE: USE ONLY AS DIRECTED

GENERAL INFORMATION:

- Hammer® can be used either pre-emergent or post-emergent of weeds and the crop.
- It is preferable that about 10mm rain should fall within seven days after a pre-emergent application in order to move the Hammer® into the top layer of the soil where it can be absorbed by roots of germinating weeds.
- Internode shortening and/or temporary yellowing of the crop may occasionally occur, especially when heavy rains (more than 15mm per hour) should fall shortly after a post-emergent application of Hammer®. These effects can be more pronounced if crops are growing under any stressful environmental conditions. Normal growth and appearance will resume within one to two weeks. No adverse effects on the yield has been recorded.
- If dry weather conditions should prevail for a period of more than seven days after application, weeds may germinate and grow. When this happens, a shallow cultivation (3 – 5cm) should follow to control weeds and to incorporate the herbicide into the top layer of the soil.
- If heavy rains falls on sandy soils within a few days after a pre-emergent application Hammer® can move out of the region where the weeds germinate, resulting in poor weed control.
- Susceptible weeds will stop growing within two to three days after the post-emergent application of Hammer®. Over the next 10 – 14 days these weeds will begin yellowing and after three to five weeks will either die or will not be competitive with the crop. Weeds will germinate after the pre-emergent application of Hammer®, but the susceptible weeds will soon show yellowing and growth will stop.

- For increased weed control of especially Tagetes minuta, a shallow surface inter-row cultivation of less than 5cm deep should be carried out at least once before the crop canopies. Ensure cultivation is not too deep as optimum control of weeds may not be achieved and further cultivations will be required.
- In lands where especially high weed populations were treated, the control of late season weeds may appear to be unacceptable. This can be attributed to the interception of the herbicide of the dense weed and crop canopy, resulting in insufficient herbicide reaching the soil for the residual control of late germinating weeds.
- Ensure thorough coverage and wetting of the weeds, especially when crop foliage is dense.

COMPATIBILITY:

- Hammer® is compatible with most commonly used pyrethroids such as Fastac 10 EC as well as herbicides like, Frontier Optima, Stomp Aqua, Acetochlor, Alachlor and Metolachlor at their recommended dosages.
- Hammer® is compatible with non-ionic surfactant and liquid ammonium sulphate.
- Hammer® is not compatible with post-emergent grass herbicides due to conflicting modes of action. When Hammer® is used in conjunction with any other agrochemical, full cognisance must be taken of all WARNINGS, PRECAUTIONS and DIRECTIONS FOR USE mentioned on those labels.

MIXING INSTRUCTIONS:

Three-quarter fill the spray tank with clean water.
The use of a registered buffering agent is recommended where water with a pH higher than 8 is to be used for spraying. Shake the Hammer® container well, measure out the required volume and pre-mix this with at least 10L of water, before adding to the spray tank. If any other product is to be mixed with Hammer®, pre-mix the required volume of product in a similar fashion.
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 during spraying.
For post-emergence spraying, add registered non-ionic surfactant and liquid ammonium sulphate to the spray tank. The required amount of both these products must first be pre-mixed with at least 10 litres water before adding to the spray tank.
The prepared spray mixture must not be left in the spray tank for any length of time, e.g. overnight.

RESISTANCE WARNING:

For resistance management, Hammer® is a group code B herbicide. Any weed population may contain individuals naturally resistant to Hammer® and other group code B herbicides. The resistant individuals can eventually dominate the weed population if these herbicides are used repeatedly and exclusively in programs. These resistant weeds may not be controlled by Hammer® or any other group code B herbicide. To delay herbicide resistance:

- Avoid exclusive repeated use of herbicides from the same herbicide group code.
- Alternate or tank-mix with products from different herbicide group codes.
- Integrate other control methods (chemical, cultural, biological) into weed control programs.

AERIAL APPLICATION:

Aerial application of Hammer® may only be done by a registered aerial application operator using a correctly calibrated, registered aircraft. 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 30L/ha 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:** The following number of droplets per cm^2 must be recovered at the target area: **Pre-emergent:** 20 – 30 and **Post-emergent:** 35 – 45
- **Droplet size:** The following droplet spectrum is recommended: **Pre-emergent:** VMD of 350 to 400 micron and **Post-emergent:** VMD of 300 – 350 micron. 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 to 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% to 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 15km/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 field(s) 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 log book and kept for future reference.

SOIL NUTRIENT STATUS:

Ensure that all plant nutrients are at optimum levels (even in regions of relatively low cropping potential) by always carrying out timeous soil fertility analyses and correcting any major or minor nutrient deficiencies.
This applies particularly to soil phosphate levels that should be at least 20 – 25ppm.

APPLICATION RATES:

DRY BEANS (*Phaseolus vulgaris* and *Phaseolus coccineus*)
(a) A single PRE-EMERGENT APPLICATION, or
(b) A programme PRE-EMERGENT followed by a POST-EMERGENT APPLICATION.

% CLAY	PRE-EMERGENT APPLICATION	The POST-EMERGENCE "FOLLOW-UP" TREATMENT
	Rate/ha	Rate/ha
0 – 15	300ml	On this soil type a "follow-up" treatment is not recommended
16 – 25	(a) 400ml or (b) 400ml	followed by 300ml + liquid ammonium sulphate + non-ionic surfactant
26* – 30	(a) 500ml or (b) 400 ml	followed by 300ml + liquid ammonium sulphate + non-ionic surfactant

*If a follow-up treatment of Hammer® is intended on soils with more than 26% clay, do not exceed 400ml/ha as a pre-emergent treatment.

COMMENTS	COMMENTS
Apply Hammer® as a pre-emergent (to crop and weeds) treatment onto a well-prepared seedbed with an even surface and free of clods. Ground application: Apply the prescribed dosage by means of a suitable ground applicator in at least 200L of water/ha as an overall application to the soil during or soon after planting. For increased grass control, Hammer® can be mixed with A registered pre-emergence grass herbicide (Frontier Optima or Stomp Aqua) at its registered rate or See tables 1 & 2 below for list of weeds controlled by Hammer® applied in this manner.	The "Followed by" treatment To improve control of late-season broadleaf weeds (especially Tagetes minuta), a 'Followed by' treatment can now be applied after a pre-emergent application of Hammer®. Ground application: Apply the prescribed dosage of Hammer® by means of a suitable ground applicator in at least 200L of water/ ha as an overall application in a tank mixture with liquid ammonium sulphate and non-ionic surfactant. Apply this treatment 2 to 3 weeks after the Hammer® pre-emergent application. This post-emergence application should not be applied on dry bean cultivars. **CAUTION:** Compact row crops with high plant populations will intercept spray droplets resulting in reduced spray deposition on weeds and soil. This may result in lowered efficacy. Correctly placed drop-arm nozzles will help to alleviate this problem. See tables 3 & 4 below for list of weeds controlled by Hammer® applied in this manner.

Aerial application:
Apply as for **Ground application** above in at least 35L water/ha. Refer to Aerial application under **DIRECTIONS FOR USE** above.
Please Note: application recommendations for pre- and post-emergent treatment differ depending on climatic conditions

GROUNDNUTS
(a) A single PRE-EMERGENT APPLICATION, or
(b) A single POST-EMERGENT APPLICATION [a follow-up treatment is not recommended]

%CLAY	PRE-EMERGENCE	POST-EMERGENCE
	Rate/ha	Rate/ha
0 – 15	300ml	Not recommended
16 – 25	400ml --------	Not recommended 700ml + liquid ammonium sulphate + non-ionic surfactant
26 – 30	500ml --------	Not recommended 700ml + liquid ammonium sulphate + non-ionic surfactant

Hammer® can be applied as either a pre- or a post-emergent treatment.
A follow-up treatment, similar to dry beans and soyabeans, is not recommended.

COMMENTS	COMMENTS
Ground application: With boom and nozzle: Apply the prescribed dose using a suitable ground applicator in at least 200L of water per ha as an overall application to the soil during or soon after planting. In areas where Tribulus terrestris is a problem, a pre-emergent application of 450ml to 500ml/ha must be used. **Warning:** This higher dosage rate may result in Hammer® remaining active longer in lighter soils (where carry over to the following season is possible). For increased grass control, Hammer® can be mixed with a registered pre-emergence grass herbicide at its registered rate, such as Frontier Optima or Stomp Aqua. See tables 1 & 2 below for list of weeds controlled by Hammer® applied in this manner.	Hammer® can be applied as a post emergence treatment when circumstances prohibited its pre-emergent use. Apply 14 – 25 days after the crop has been planted. This will usually be when most of the weeds are 3 – 6cm tall (1 – 3 leaf stage). Hammer® should be preceded by a registered pre-emergent grass herbicide. **Ground application:** With boom and nozzle: Apply the prescribed dosage of Hammer® by means of a suitable ground applicator in at least 200L of water/ha as an overall application. **CAUTION:** Compact row crops with high plant populations will intercept spray droplets resulting in reduced spray deposition on weeds and soil. This may result in lowered efficacy. Correctly placed drop-arm nozzles will help to alleviate this problem. See tables 3 & 4 below for list of weeds controlled by Hammer®.

Aerial Application: Apply as for **Ground application** above in at least 35L of water/ha. Refer to **Aerial application** under **DIRECTIONS FOR USE** above.
Please Note: application recommendations for pre- and post-emergent treatment differ depending on climatic conditions.

SOYABEANS
(a) A single PRE-EMERGENT APPLICATION, or
(b) A programme PRE-EMERGENT followed by a POST-EMERGENT APPLICATION, or
(c) A single POST-EMERGENT APPLICATION.

% CLAY	PRE-EMERGENT APPLICATION	POST-EMERGENCE "FOLLOW-UP" TREATMENT	POST-EMERGENCE
	Rate/ha	Rate/ha	Rate/ha
0 – 15	300ml	On this soil type a "follow-up" treatment is not recommended	Not recommended
16 – 25	(a) 400ml or (b) 400ml followed by	300ml + liquid ammonium sulphate + non-ionic surfactant	700ml + liquid ammonium sulphate + non-ionic surfactant
26*– 30	(a) 500ml or (b) 400ml followed by	300ml + liquid ammonium sulphate + non-ionic surfactant	700ml + liquid ammonium sulphate + non-ionic surfactant

*If a follow-up treatment of Hammer® is intended on soils with more than 26 % clay, do not exceed 400ml/ha as a pre-emergent treatment.

COMMENTS	COMMENTS	COMMENTS
Apply Hammer® as a pre-emergent (to crop and weeds) treatment onto a well prepared seedbed with an even surface and free of clods. **Ground application:** With boom and nozzle: Apply the prescribed dose by using a suitable ground applicator in at least 200L of water/ha as an overall application to the soil during or soon after planting. For increased grass control, Hammer® can be mixed with A registered pre-emergence grass herbicide at its registered rate, such as Frontier Optima or Stomp Aqua See tables: 1 & 2 below for list of weeds controlled by Hammer® applied in this manner	To improve control of late-season broadleaf weeds (especially Tagetes minuta), a 'Followed by' treatment can now be applied after a pre-emergent application of Hammer®. **Ground application:** with boom and nozzle: Apply the prescribed dose of Hammer® using a suitable ground applicator in at least 200L of water/ha as an overall application in a tank mixture with liquid ammonium sulphate and non-ionic surfactant. Apply this treatment 14 – 25 days after the Hammer® pre-emergent application. **CAUTION:** Compact row crops with high plant populations will intercept spray droplets resulting in reduced spray deposition on weeds and soil. This may result in lowered efficacy. Correctly placed drop-arm nozzles will help to alleviate this problem. See tables 3 & 4 below for list of weeds controlled by Hammer® applied in this manner.	Apply this treatment as a post emergent application where circumstances prohibited the pre-emergent use of Hammer®. Apply 14 – 25 days after the crop has been planted. This will usually be when most of the weeds are 3 – 6cm tall (1 – 3 leaf stage). **Ground application**: With boom and nozzle: Apply the prescribed dose of Hammer® using of a suitable ground applicator in at least 200L of water/ha as an overall application. The recommended rate of Hammer® should follow the application of a registered pre-emergent grass herbicide. **CAUTION:** Compact row crops with high plant populations will intercept spray droplets resulting in reduced spray deposition on weeds and soil. This may result in lowered efficacy. Correctly placed drop-arm nozzles will help to alleviate this problem. See tables: 3 & 4 below for list of weeds controlled by Hammer® in this manner.

Aerial application:
Apply as for Ground application above in at least 35 litres water/ha. Refer to Aerial application under DIRECTIONS FOR USE above.
Please Note: application recommendations for pre- and post-emergent treatment differ depending on climatic conditions.

Table 1: Weeds normally controlled by Hammer® when applied pre-emergent:

SCIENTIFIC NAME	COMMON NAME
Acanthospermum hispidum	Upright starbur
Amaranthus thunbergii	Red pigweed
Amaranthus deflexus	Perennial pigweed
Chenopodium album	White goosefoot
Amaranthus hybridus	Common pigweed

Table 2: Hammer® (applied pre-emergent) on its own provides variable control (75% – 80%) of the following weeds:

SCIENTIFIC NAME	COMMON NAME
Commelina benghalensis	Wandering jew
Galinsoga parviflora	Quick weed
Cyperus esculentus	Yellow nutsedge
Portulaca oleracea	Common purslane
Cyperus rotundus	Purple nutsedge
Tagetes minuta	Khaki weed
Datura ferox	Common thorn apple
Tribulus terrestris (1)	Common dubbeltjie
Datura stramonium	Large thorn apple
Xanthium strumarium	Cockleburr

When Hammer® is used in combination with a grass control partner like, Frontier Optima, Stomp Aqua or Acetolachlor, in either a tank mixture or as a split application, control of the above weeds will be increased (refer also to the relevant product label for weeds controlled by that product).
In areas where Tribulus terrestris is a problem, a dosage rate of at least 450ml/ha may be used as a pre-emergent treatment irrespective of soil type which will result in control of greater than 80%. This higher dose rate for certain soils may however influence the waiting periods for follow crops. See USE RESTRICTIONS above.

Table 3: Weeds controlled by Hammer® (applied post-emergent) when preceded by a registered pre-emergent grass herbicide (which includes a Hammer® pre-emergent treatment).

SCIENTIFIC NAME	COMMON NAME
Acanthospermum australe	8 seeded prostrate starburr
Datura ferox	Large thorn apple
Acanthospermum glabratum	5 seeded prostrate starburr
Datura stramonium	Common thorn apple
Acanthospermum hispidum	Upright starburr
Flaveria bidentis	Smelter's bush
Amaranthus deflexus	Perennial pigweed
Galinsoga parviflora	Gallant soldier
Amaranthus hybridus	Common pigweed
Amaranthus thunbergii	Red pigweed
Nicandra physaloides	Apple of Peru
Physalis angulata	Wild gooseberry
Chenopodium album	White goosefoot
*Tagetes minuta**	Khaki weed
Cleome monophylla	Spindlepod
Triumfetta annua	Burs
Commelina benghalensis	Wandering Jew
Xanthium strumarium	Cocklebur

* = Only weeds which are fully emerged are well controlled – seedlings which emerge after application are only 60 – 70% controlled

Table 4: Variable control of the following weeds is achieved with Hammer® alone (applied post-emergent).

SCIENTIFIC NAME	COMMON NAME	LEVEL OF CONTROL
Bidens pilosa	Blackjack	up to 70 %
Hibiscus trionum	Bladderweed	up to 70 %
Bidens Formosa	Cosmos	up to 70 %
Ipomoea purpurea	Morning glory	up to 70 %
Cyperus esculentus	Yellow nutsedge	up to 80 %
Panicum schinzii#2	Sweet buffalo grass	up to 90 %
Cyperus rotundus	Purple nutsedge	up to 80 %
Portulaca oleracea	Purslane	up to 70 %
Digitaria sanguinalis	Crab finger grass	75 – 90 %
Rottboelia spp	Mulungwe	70 – 85 %
Echinochloa colona	Marsh grass	75 – 80 %
Schkuhria pinnata	Dwarf marigold	80 – 90 %
Echinochloa crus-galli	Barnyard grass	75 – 80 %
Sorghum halepense	Johnson grass	up to 80 %
Eleusine indica	Goose grass	up to 70 %
Tribulus terrestris	Devil thorn	up to 70 %
Eragrostis curvula	Love grass	up to 70 %
Zea mais #3	Volunteer maize	up to 99 %

#2 = Plants turn purple within two to three weeks but take longer to die than most other weeds – minimum of four to five weeks.
#3 = Maize varieties that are tolerant to HAMMERTM will not be controlled. Contact the supplier for information on tolerant maize varieties.

WAITING PERIOD FOR FOLLOW-UP CROPS

- To avoid possible damage to follow-crops, the waiting periods as indicated below should lapse after the last application of Hammer® and the planting of the follow up crop.
- However, the waiting periods mentioned here will only be valid if;
  - the standard, recommended Hammer® rate for the soil type was applied, and
  - at least 350mm of well distributed rainfall and/or irrigation was recorded, which was enough to ensure a reasonable field legume harvest. This rain or irrigation must have occurred after the application of Hammer® and prior to the planting of the follow-crop.
- When the higher rate was used to control Tribulus terrestris, the safety periods mentioned in the table below must be extended by a further 12 months, to at least 20 months, before a Hammer® -sensitive crop can be planted with relative safety.
- The land should always be deep ploughed before planting a follow-crop.
- Test planting is nevertheless recommended.

CROP	WAITING PERIOD
Dry beans, soyabeans and groundnuts	None
Any other legume crop (other than dry bean, soyabeans or groundnuts)	10 months
Wheat	6 months
Maize	12 months, but depending on the following factors and their interrelationship, waiting period may be shorter. • soil type, • rainfall or irrigation, • application rate used, • maize variety to be planted Contact the supplier for further information
All other crops (including popcorn & sweet-corn)	24 months