


# CARBOSTEM

**BEFORE USING THIS PRODUCT, READ THE LABEL CAREFULLY**

**GERUIGSAANWYSINGS INGESLUIT**  
**VERWYS NA BESONDERHEDE**  
**SOOS OP HOUER / SAK GEDRUK**

**DIRECTIONS FOR USE ENCLOSED**  
**REFER TO DETAILS AS PRINTED**  
**ON CONTAINER / BAG**

CARBOSTEM
INSECTICIDE


Reg. No. L7859, Act/Wet No. 36 of/van 1947

2: 24/06/2014

**An emulsifiable concentrate systemic insecticide and nematocidal for the control of the agricultural pests on the crops as listed.**


**'n Emulgeerbare konsentraat sistemiese insekdoder vir die beheer van landbouplae op gewasse soos aangedui.**

IRAC INSECTICIDE GROUP CODE	1A	IRAC INSEKDODER GROEPKODE
<b>ACTIVE INGREDIENT / AKTIEWE BESTANDDEEL</b>		
Carbosulfan (carbamate)	480 g/l	Karbosulfan (karbamaat)


Registration Holder / Registrasiehouer  
**Meridian Agrochemical Company (Pty.) Ltd. / (Edms.) Bpk.**  
 Reg. No. 2000/010819/07  
 P.O. Box / Posbus 436, Modderfontein, 1645, South Africa / Suid-Afrika


10L

PRODUCT INFORMATION / PRODUKINLIGTING: TEL: 011 822 8509  
 IN CASE OF POISONING / IN GEVAL VAN VERGIFTIGING:  
 Griffon Poison Centre: 082 446 8946



UN Number: 2991





TOXIC / GIFTIG

## WARNINGS

**Allow the following number of days between last treatment and harvest or use as food or feed:**

Cotton, Maize and Grapevines.....84 days

- Handle with extreme care.
- Poisonous by contact, inhalation or swallowing.
- May irritate eyes and skin.
- Toxic to bees, fish and wildlife.
- Store under lock and key in a cool, dry place.
- Store away from food, feed, fertilizer and other agricultural products.
- Keep out of reach of children, uninformed persons and animals.
- **FLAMMABLE** – Do not store or open container near open flame.
- Do not use this product in any way contrary to the directions on this label.
- **CARBOSTEM** has been tested on the most important commercial cultivars without any phytotoxic effects. More susceptible cultivars may be released in future which need to be tested; for this apply **CARBOSTEM** to a limited test area before commercial applications are made.
- **Re-entry interval:** Do not enter treated area within 2 days after treatment unless wearing protective clothing.
- **In case of poisoning call a doctor and make this label available to him/her.**
- **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 water, adjacent areas or crops.**

**Although this remedy has been extensively tested under a large variety of conditions, the registration holder does not warrant that it will be effective under all conditions. The activity 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 pest against the remedy, 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 failure by the user to follow the label instructions, or 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.**

## PRECAUTIONS

- Do not inhale fumes or spray mist.
- Avoid skin and eye contact by wearing full protective clothing (protective gloves, boots and face shield) when mixing and applying the product.
- Wash with soap and cold water immediately after use and accidental skin contact, as well as contaminated clothing.
- Wash contaminated clothing immediately after use.
- All persons in direct contact with the product, including markers must wear protective clothing as well as a suitable respirator.
- Do not eat, drink or smoke while mixing or applying the product, or before washing hands and face and changing clothing.
- Avoid drift of spray onto other crops, grazing, rivers, dams and areas not under treatment.
- Clean applicator after use. Dispose of rinsate where it will not contaminate crops, grazing, rivers, dams and boreholes.
- Prevent contamination of food, feeds, drinking water and eating utensils.
- Invert the container over the spray tank or mixing tank and allow as much of the product to drain from the container. Thereafter, rinse the empty container three times with a volume of water equal to a minimum 10% of that of the container. Add the rinsate to the contents of the spray tank before destroying the container.
- Destroy the empty container by perforation and flattening and dispose of it in a safe manner.
- **Never** re-use the empty container for any other purpose.

## SYMPTOMS OF HUMAN POISONING

Headache, fatigue, faintness, giddiness, excessive sweating, nausea, abdominal pain, vomiting, muscle twitching, unusually small pupils, respiratory distress and coma.

### FIRST AID TREATMENT

**Skin contact:** Remove patient from source of poisoning and keep them quiet and reassured. Remove contaminated clothing as well as shoes and leather goods. Wash body with non-abrasive soap and lots of water. Persons providing first aid must wear gloves to avoid self-contamination. Seek medical advice if necessary.

**Eye contact:** Flush eyes immediately with large amounts of clean water for approximately 15 minutes. Occasionally lift the upper and lower lids. If eye irritation persists, get medical attention.

**Inhalation:** Remove patient from source of poisoning to a well-ventilated area and loosen clothing around the neck. Perform artificial respiration and administer oxygen if necessary. Keep patient warm and calm. **Seek medical advice immediately.**

**Ingestion:** If concentrate or water diluted mixture has been swallowed, do not induce vomiting – call a doctor. Vomiting should be supervised by a physician because of possible pulmonary damage by aspiration of the solvent. If product concentrate has been swallowed, **immediately take patient to the nearest doctor.** Do not induce vomiting. **Get medical attention immediately.** Administration of gastric lavage or oxygen should be performed by qualified medical personnel.

### **NOTE TO PHYSICIAN**

The active ingredient is a reversible cholinesterase inhibitor. Administer 2 to 4 mg atropine sulphate intravenously, repeated at 10 minute intervals until atropinisation appears. Do not use oximes such as 2 PAM. If in eye install one drop of homotropine. Treat symptomatically and supportively. Keep patient under observation. If product is aspirated into the lungs during ingestion or vomiting, chemical pneumonia may be caused. If vomiting occurs, prevent vomit from being inhaled.

### **RESISTANCE WARNING**

For resistance management, **CARBOSTEM** is a group code 1A insecticide. Any insect population may contain individuals naturally resistant to **CARBOSTEM** and other group code 1A insecticides. The resistant individuals can eventually dominate the insect population if these insecticides are used repeatedly. These resistant insects may not be controlled by **CARBOSTEM** or any other group code 1A insecticide.

#### **To delay insecticide resistance:**

- Avoid exclusive repeated use of insecticides from the same insecticide group code. Alternate or tank mix with registered products from different insecticide group codes.
- Integrate other control methods (chemical, cultural, biological) into insect control programmes.

Since the occurrence of resistance cannot be forecast, users are advised to keep treated crops under close observation. If treatment is not effective following the use of **CARBOSTEM** as recommended, a resistant population may be present. If a resistant population is positively identified, consideration should be given to prompt use of an insecticide with a different mode of action for which there is no record of resistance to the relevant pest. For specific information on resistance management, contact the registration holder of this product.

### **DIRECTIONS FOR USE**

**Use only as directed.**

### **MIXING INSTRUCTIONS**

The efficacy of **CARBOSTEM** can be reduced by very hard water (> 1 000 ppm solutes) as well as by water with a high pH. To ensure optimum efficacy, **CARBOSTEM** should be applied in water of pH 4.5 to 5.5. Where spray water is outside of this pH range, the water should be buffered to within the recommended pH range by use of a registered pH buffer. Where a pH buffering agent is used, this must be thoroughly mixed into the total spray water volume before the **CARBOSTEM** is added.

Should the spray water pH be in the correct pH range, the following procedure may be followed: Half-fill the spray tank with suitable water. Shake the container thoroughly prior to use. Add the required quantity of **CARBOSTEM** to the water. Fill the spray tank to the desired volume. **Tank mixtures must be sprayed out immediately and not allowed to stand in the spray tank overnight.** Spraying equipment must be thoroughly flushed out at the end of the spraying operation.

## COMPATIBILITY

The compatibility of **CARBOSTEM** with other products depends on the formulations of the respective products as well as the quality of the spray water to be used. As formulations change from time to time, it is recommended that a physical compatibility test be done prior to the tank mixture being made. Do not make tank mixtures with other agricultural remedies or foliar feed products without first ensuring that no reduction in efficacy or crop damage will result. When mixing **CARBOSTEM** with other products, follow all label instructions carefully.

## APPLICATION METHODS

Ensure that the equipment is correctly calibrated and is checked regularly during application to ensure even and accurate application. **Constant agitation throughout the spray operation is essential.** Only clean water should be used.

## GROUND APPLICATION

- **CARBOSTEM** can be applied with conventional high volume spraying equipment fitted with hollow cone nozzles to give medium to fine droplets. Calibrate the apparatus prior to application to ensure that the correct dosage is applied. Ensure that the distribution of the spray is uniform throughout the target area.
- Spray volumes must be adapted according to the size, growing pattern and leaf density of the crop. Use an appropriate spray volume to ensure thorough coverage and wetting of all the plant parts. Monitor efficacy within 3 days and reapply if necessary.

## AERIAL APPLICATION

Aerial application of **CARBOSTEM** 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 50 litres 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: 30 to 40 droplets per cm<sup>2</sup> must be recovered at the target area.
- Droplet size: A droplet spectrum with a VMD of 250 to 280 microns is recommended. Limit the production of fine droplets less than 150 microns (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 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 the relevant data will be compiled in a logbook and kept for future reference.

## USE RESTRICTIONS

- Only apply **CARBOSTEM** using an accurate and safe application technique.
- If **CARBOSTEM** is used in a tank mix with other recommended products, consideration should be given to the restrictions of those respective products.
- Do not apply this product in combination or tank mixture with any other product or agricultural remedy which is not specifically listed on this label. Meridian Agrochemical Company (Pty) Ltd accepts no responsibility for any negative effects experienced if the instructions on this label are not adhered to, unless a Meridian representative was consulted beforehand.

### Application to maize:

For Preventive treatment at planting time of maize, **CARBOSTEM** should be applied in a small volume of water while planting is taking place. This requires the use of low pressure spraying equipment mounted on the tractor/planter. The equipment must be capable of applying low volumes of spray solution and must be accurately calibrated.

The spray nozzles of the spray equipment should be mounted on a planter in such a way that a 50 mm band of spray solution can be sprayed into the open planting furrow, before it is closed and compressed by the presswheel. It is preferable that the nozzle should be angled slightly backwards towards the presswheel so that some soil (5 to 10 mm) will have fallen over the seed by the time the spray solution is sprayed into the furrow.

Calibration should be carried out as follows: -

- Determine the time which it takes the tractor and planter to cover 100 metre when planting. This will be X minutes.
- Add some clean water to the spray tank and run the spray equipment for X minutes as determined above, whilst simultaneously collecting water from each nozzle. All nozzles should deliver the same amount of liquid. Find the average delivery per nozzle. This gives Y mℓ in X minutes or Y mℓ per 100 metre row length.
- Divide the average delivery per nozzle into the volume of the spray tank multiply 1000 thus:

$\frac{\text{Volume of spray tank} \times 1000}{\text{Average delivery per nozzle in m}\ell}$	=	Number of rows of 100 meters which can be sprayed.
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- To determine the amount of **CARBOSTEM** to be added per tank load, multiply the **CARBOSTEM** dosage required, namely 50 mℓ/100 metre row length or 40 mℓ/100 metre row length, by the number of rows (determined above) that can be sprayed.
- Mix this amount of **CARBOSTEM** with an equivalent amount of water. Mix thoroughly, and pour into the spray tank. Top up the tank with clean water while agitating.

**NOTE:** Ensure that each nozzle delivers at least 450 mℓ over the 100 metre distance. On this basis a spray tank with a capacity of 150 litres will hold enough spray solution for 3 hectares of maize planted in 0.9 metre rows.

## RECOMMENDATIONS

CROP/PEST	APPLICATION RATE	REMARKS
<b>Maize</b> Black maize beetle Stalkborer Nematodes Ground weevils Leafhopper False wireworm	50 mℓ / 100 m planting furrow applied in at least 400 mℓ water.	Apply preventatively and should control stalkborer for up to 6 weeks. In situations where reduced tillage is practiced, pest populations may be higher. In such circumstances it is important to monitor the degree of control from the first application and if necessary re-apply at the recommended rate. Follow-up rain or irrigation is essential for adequate absorption and translocation.
<b>Maize</b> Nematodes Ground weevils Leafhopper False wireworm	40 mℓ / 100 m planting furrow applied in at least 400 mℓ water.	Will suppress black maize beetle and stalkborer.
<b>Maize</b> Ground weevils ( <i>Protostrophus spp.</i> )	10 mℓ / 100 m planting furrow applied in at least 2 ℓ water.	Ground weevils will only be killed after feeding – limited insect damage can, therefore, still occur after application to young plant.
<b>Maize</b> Maize stalk borer ( <i>Busseola fusca</i> )	420 mℓ <b>CARBOSTEM</b> / ha + 170 mℓ <b>LAMBADA AQUAMUL</b> / ha.	For optimal efficacy, apply <b>CARBOSTEM</b> in tank mix with a registered pyrethroid such as <b>LAMBADA AQUAMUL</b> as an early corrective spray against young larvae. For best results, treatment must be applied before the larvae enter the stalks. Do not apply to plants that are under drought stress. The systemic activity decreases in mature plants. Apply only to plants that are actively growing and no later than the stage when the tassels or ears are enclosed by the flag leaf.  <b>Ground application:</b> Apply as an early corrective treatment in 300 ℓ / ha when the young larvae are noticed and not later than when 10% of the crops exhibit shot-hole damage. A second application 10 – 12 days later may be needed when the larvae are bigger than 10 mm or if a re-infestation occurs.  <b>Aerial application:</b> As above. Apply in 30 – 40 ℓ / ha.

### Remarks

- For corrective control of *Protostrophus spp.* (ground weevils) in maize apply **CARBOSTEM** when the first signs of infestation on the young seedlings are noticed. The sprayer should be rigged up in such a way that each nozzle sprays a band 300 mm wide over the maize row. In order to achieve good coverage calibrate the sprayer to deliver 2 ℓ of spray solution per 100 m row length.
- For early corrective control of 1<sup>st</sup> and 2<sup>nd</sup> generation maize stalkborer (*Busseola fusca*) in maize, apply **CARBOSTEM** in tank mixture with a registered pyrethroid (e.g. **LAMBADA AQUAMUL** (L. 9583) or **ICHIBAN 100 EW** (L. 9248) once the first signs of shot-hole damage are observed on Sweetcorn, and when 10% of the plants show shot-hole damage in maize. Follow all directions for use on the relevant pyrethroid label.

<p style="text-align: center;"><b>Cotton</b></p> <p>Cotton aphids (<i>Aphis gossypii</i>)</p>	<p>Apply 500 ml/ha for plants up to 60 cm in height. For plants higher than 60 cm apply 750 ml/ha.</p>	<p>Applications should be based on scouting. Dosage rate depends on physical plant size. Apply in 100 l/ha for plants smaller than 60 cm. Apply in 200 l/ha for plants taller than 60 cm. Commence spraying when aphids are observed in dry land cotton or when honeydew is detected in irrigation cotton.</p>
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**Remarks**

- Apply **CARBOSTEM** as a full cover spray in sufficient water to thoroughly wet the foliage (ground application) and in a minimum of 50 litre of water per hectare (aerial application).

<p style="text-align: center;"><b>Vines</b></p> <p>Bud mite (<i>Colomerus vitis</i>)</p>	<p>Apply 50 ml/100 l water.</p>	<p>Apply three sprays. Apply when shoots are 5 to 10 cm long and the second and third sprays at 14 day intervals.</p>
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**Remarks**

- Bud mite migrate to new growth from their overwintering position. Application must take place during migration.
- Contact ARC-Infruitec Nietvoorbij for latest recommendations and ensure that applications meet export requirements.

**ACKNOWLEDGEMENT OF TRADEMARKS**

**Ichiban 100 EW** (L. 9248)  
**Lambda aquamul** (L. 9583)

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## WAARSKUWINGS

Laat die volgende aantal dae toe tussen laaste toediening en oes of gebruik as voedsel of voer:

Katoen, Mielies en Wingerd.....84 dae

- Hanteer uiters versigtig.
- Giftig wanneer die produk deur die vel opgeneem, ingesluk of ingesem word.
- Mag oë en vel irriteer.
- Giftig vir bye, visse, en wild.
- Berg agter slot en grendel in 'n koel, droë plek.
- Berg weg van voedsel, voer, kunsmis en ander landbou produkte.
- Hou buite bereik van kinders, oningeligte persone en diere.
- **VLAMBAAR** – Berg en maak houer oop weg van oop vlamme.
- Moet nie hierdie produk op 'n manier gebruik wat nie op hierdie etiket aanbeveel is nie.
- **CARBOSTEM** is getoets op die belangrikste kommersiële kultivars sonder enige fitotoksiese effekte. Meer vatbare kultivars kan in die toekoms aangeplant word, in hierdie situasies, dien **CARBOSTEM** toe op 'n beperkte toets area voordat kommersiële areas behandel word.
- **Herbetreding** – Moet nie behandelde gebiede binne twee dae na toediening betree nie, tensy beskermende oorklere gedra word.
- **In geval van vergiftiging ontbied 'n geneesheer en stel die etiket aan hom/haar.**
- **LUGTOEDIENING:** stel al die inwoners in die onmiddellike omgewing van die gebied wat gespuit gaan word in kennis en reik die nodige waarskuwings uit. Vermy besoedeling van of wegdryf van spuitnewel na water, aangrensende gebiede of gewasse.

**Hoewel hierdie middel omvattend onder 'n groot verskeidenheid toestande getoets is, waarborg die registrasiehouer nie dat dit onder alle toestande doeltreffend sal wees nie. Die werking en doeltreffendheid daarvan kan beïnvloed word deur faktore soos abnormale grond-, klimaats- en bergingstoestande, kwaliteit van die verdunningswater, verenigbaarheid met ander stowwe wat nie op die etiket aangedui word nie en die voorkoms van weerstand van die plaag teen die betrokke middel sowel as die tyd en akkuraatheid van toediening. Verder aanvaar die registrasiehouer nie verantwoordlikheid vir skade aan gewasse, plantegroei en die omgewing of nadelige invloede op mens of dier of vir 'n gebrek aan prestasie van die betrokke middel as gevolg van versuim van die gebruiker om etiketaanwysings na te kom, of as gevolg van die ontstaan van toestande wat nie kragtens die registrasie voorsien kon word nie. Raadpleeg die verskaffer in die geval van enige onsekerheid.**

## VOORSORGMATREËLS

- Moet nie dampe of spuitnewel inasem nie.
- Vermy kontak met die vel en oë deur beskermende klere (beskermende handskoene, skoene en gesigskerm) te dra wanneer die produk gemeng word en gedurende toediening.
- Was met seep en koue water onmiddellik na gebruik en toevallige Velkontak, sowel as besoedelde klere.
- Was besoedelde klere onmiddellik na gebruik.
- Alle persone in direkte kontak met die produk, sowel as die merkers, moet beskermende klere sowel as 'n geskikte gasmasker dra.
- Moet nie eet, drink of rook tydens vermenging of toediening van die produk, of voordat hande en gesig gewas is en skoon klere aangetrek is nie.
- Vermy spuitnewel na ander gewasse, weiding, riviere, damme en areas wat nie behandel moet word nie.
- Maak toedieningsapparaat skoon na gebruik. Doen weg met uitspoelwater sodat gewasse, weiding, riviere, damme en boorgate nie besoedel word nie.
- Voorkom die besoedeling van voedsel, voer, drinkwater en eetgerei.
- Keer die leë houer om oor die spuittenk of mengbak en laat toe om so veel as moontlik van die produk te laat uit dreineer. Spoel daarna die leë houer drie keer uit met 'n volume water gelyk aan 10 % van die houer. Voeg spoelwater by die inhoud van die spuittenk voordat die houer vernietig word.
- Vernietig die leë houer deur gate daarin te kap en plat te slaan en doen weg daarmee op 'n veilige manier.
- Moet **nooit** die leë houer vir enige ander doel hergebruik nie.



## SIMPROME VAN MENSLIKE VERGIFTING

Hoofpyn, moegheid, flouheid, duiseligheid, oormatige sweet, naarheid, maagpyn, braking, spiertrekking, ongewone klein pupille, asemhalingsnood en koma.

## NOODHULPBEHANDELING

**Velkontak:** Verwyder persoon van die bron van vergiftiging, hou hom/haar stil en stel hom/haar gerus. Verwyder besoedelde klere, sowel as skoene en leer items. Was die lyf met 'n sagte seep en baie water. Moet nie 'n skuurmiddel gebruik nie. Persone wat noodhulp toedien, moet handskoene dra om selfkontaminasie te voorkom. Ontbied mediese hulp indien nodig.

**Oogkontak:** Was oë onmiddellik uit met groot hoeveelhede skoon water, vir ongeveer 15 minute. Lig die onderste en boonste ooglede nou en dan. Indien oog irritasie aanhou, ontbied mediese hulp.

**Inaseming:** Verwyder die persoon van die bron van vergiftiging na 'n goed geventileerde area en maak klere om die nek los. Pas kunsmatige asemhaling toe en dien suurstof toe indien nodig. Hou die pasiënt warm en stel die pasiënt gerus. **Ontbied onmiddellik mediese hulp.**

**Mondelike inname:** Indien konsentraat of water verdunde mengsel ingesluk is, moet nie braking veroorsaak nie – ontbied 'n geneesheer. Braking moet onder die toesig van 'n geneesheer gedoen word, aangesien longe moontlik beskadig kan word as gevolg van inaseming van die oplosmiddel. Indien produk konsentraat ingesluk is, neem die pasiënt onmiddellik na die naaste geneesheer. Moet nie braking veroorsaak nie. **Ontbied onmiddellik mediese hulp.** Toediening van gastriese spoeling of suurstof moet net deur gekwalifiseerde mediese personeel toegedien word.

## NOTA AAN GENEESHEER

Die aktiewe bestanddeel is 'n omkeerbare cholinesterase inhibeerder. Dien 2 tot 4 mg atropiensulfaat binnears toe, herhaal met 10 minute tussenposes totdat atropinisasie voorkom. Moet nie oksieme soos 2-PAM gebruik nie. Indien in oë, dien een druppel homotropien toe. Behandel simptome en ondersteunend. Hou die pasiënt onder observasie. Indien die produk na lange ingeasem word tydens inname of braking, kan chemiese inflammasie van die longe veroorsaak word. Indien braking voorkom, tref voorsorg dat braking nie ingeasem word nie.

## WEERSTANDSWAARSKUWING

**CARBOSTEM** is 'n groepkode 1A insekdoder. Enige populasie van 'n spesifieke insek mag individue insluit wat 'n natuurlike weerstand teen **CARBOSTEM**, of enige ander groepkode 1A insekdoder het. Indien hierdie insekdoders herhaaldelik aangewend word, kan die weerstandbiedende individue uiteindelik die insek populasie oorheers. Hierdie weerstandbiedende insekte sal waarskynlik nie deur **CARBOSTEM** of enige ander groepkode 1A insekdoder beheer word nie.

### Om weerstand teen insekdoders te vertraag:

- Vermyn die eksklusiewe, herhaaldelike gebruik van insekdoders met dieselfde groepkode. Wissel af met, of gebruik tenkmengsels van, produkte in verskillende insekdodergroepkodes.
- Integreer ander beheermaatreëls (chemies, verbouing, biologies) in insekdoder programme.

Aangesien die voorkoms van weerstand nie voorspel kan word nie, word gebruikers derhalwe gemaan om behandelde gewasse noukeurig dop te hou. Indien die behandeling nie doeltreffend is nie na bespuiting met **CARBOSTEM** soos aanbeveel, mag 'n weerstandbiedende bevolking teenwoordig wees. Indien 'n weerstandbiedende bevolking positief geïdentifiseer word, skakel dadelik oor na ander geskikte insekdoders met 'n ander werking waar geen weerstand opgemerk is nie. Vir spesifieke inligting oor weerstandsbestuur kontak die registrasiehouer van hierdie produk.

## GEBRUIKSAANWYSINGS

**Gebruik slegs soos aangedui.**

## MENGINSTRUKSIES

Die effektiwiteit van **CARBOSTEM** kan geaffekteer word deur baie brak water (> 1 000 dpm opgeloste stowwe) sowel as water met 'n hoë pH waarde. Om optimale effektiwiteit van **CARBOSTEM** te verseker, moet dit in water met 'n pH van 4.5 tot 5.5 aangewend word. Spuitwater buite hierdie pH moet gebuffer word tot binne die aanbevole pH waardes deur gebruik te maak van 'n geregistreerde pH buffer. Indien 'n buffer agent gebruik word, moet dit eers deeglik met die totale spuitwater volume gemeng wees, alvorens die **CARBOSTEM** bygevoeg word.

Indien die spuitwater in die korrekte pH waardes val, moet die volgende prosedure gevolg word: Maak die spuitenk halfvol met geskikte water. Skud die houer deeglik voor gebruik. Voeg die benodigde hoeveelheid **CARBOSTEM** by die water. Vul die spuitenk tot die verlangde volume. **Die tenkmengsel moet onmiddellik uitgespuit word en nie toegelaat word om oornag in die spuitenk te staan nie.** Die spuittoerusting moet aan die einde van toediening deeglik uitgewas word.

## VERENIGBAARHEID

Die verenigbaarheid van **CARBOSTEM** met ander produkte hang af van die formulering van die betrokke produkte asook die kwaliteit van die spuitwater. Omrede formuleringe van tyd tot tyd verander, word dit aanbeveel dat 'n fisiese verenigbaarheidstoets uitgevoer word, voordat die tenkmengsel gemaak word. Moet nie tenkmengsels met ander landbou produkte of blaarvoedings maak nie, alvorens versekering het dat geen verlagings in effektiwiteit of gewasskade sal voorkom nie. Indien **CARBOSTEM** met ander produkte gemeng word, moet die betrokke etiket aanwysings deeglik gevolg word.

## TOEDIENINGSMETODES

Maak seker dat die spuittoerusting korrek gekalibreer is en moet gedurende die toediening nagegaan word om seker te maak dat die toediening egalig en akkuraat is. **Die mengsel moet aanhoudend en deeglik geroer word tydens toediening.** Gebruik slegs skoon water.

## GRONDTOEDIENING

- **CARBOSTEM** kan met konvensionele hoë volume spuitapparaat wat met holkeël spuitpunte toegerus is, en wat medium tot fyn druppels lewer, toegedien word. Kalibreer die apparaat voor toediening om te verseker dat die regte dosis gelewer word. Verseker dat die verspreiding van die spuitmengsel egalig oor die teikengebied is.
- Die spuitvolumes moet aangepas word by die grootte, groeipatroon en lowerdigtheid van die gewas. Spuit die toepaslike volume om 'n deeglike bedekking en benutting van alle plantdele te verseker. Monitor die effektiwiteit binne 3 dae, en herhaal toediening, indien nodig.

## LUGTOEDIENING

**CARBOSTEM** 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 teiken area 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 Spuitmengsel volume van 50 liter per hektaar 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.
- Druppel bedekking: 30 tot 40 druppels per cm<sup>2</sup> moet op die teiken area herwin word.
- Druppelgrootte: 'n Druppelspektrum met 'n VMD van 250 tot 280 mikrons word aanbeveel. Beperk die produksie van druppels kleiner as 150 mikrons (hoë drywing en verdampingspotensiaal) tot 'n minimum.
- Vlieghoogte: Handhaaf die hoogte van die spuitbalk bo die teiken op 3 tot 4 meter. Moet nie spuit wanneer die vliegtuig duik nie, 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 binnste 60 tot 75 % van die vlerkspan om te verhoed dat druppels binne-in die vlerkpuntvorteks beweeg.
- Die verskil in temperatuur tussen die nat- en droëboltermometer van 'n swaai-higrometer, moet nie 8°C oorskry nie.
- Stop bespuiting indien die windspoed 15 km/h 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 lugvog 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 area.
- Verseker dat die Lugbespuitingsoperateur presies weet watter 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.

### GEBRUIKSBEPERKINGS

- Dien **CARBOSTEM** slegs toe met 'n akkurate en veilige toedienings metode.
- Indien **CARBOSTEM** gebruik word met ander aanbevole produkte, moet aandag gegee word aan die beperkings van daardie betrokke produkte.
- Moenie hierdie produk in kombinasie of tenkmengsel gebruik met enige ander produk of landboumiddel wat nie spesifiek op die etiket gelys is nie. Meridian Agrochemical Company (Pty) Ltd aanvaar geen verantwoordelikheid vir enige negatiewe gevolge wat ondervind word as die instruksies op die etiket nie nagekom word nie, tensy 'n Meridian verteenwoordiger vooraf geraadpleeg is.

#### Toediening op mielies:

Vir voorkomende behandeling met plant, dien **CARBOSTEM** toe in 'n klein volume water gedurende die plantproses. Dit vereis die gebruik van laedrukspuittoerusting, gemonteer op die trekker/planter. Die toerusting moet in staat wees om lae volumes spuitoplossing toe te dien en moet akkuraat gekalibreer wees.

Die spuitkoppe van die spuittoerusting moet op so 'n wyse op die planter gemonteer wees, dat 'n 50 mm strook spuitoplossing, in die oop plantvoor gespuit word, voordat dit toegemaak en vasgetrap word deur die drukwiel. Die spuitkop moet verkieslik na die drukwiel gerig wees, teen 'n hoek wat effens na agter neig sodat 'n bietjie grond (5 tot 10 mm) reeds oor die saad geval het teen die tyd dat die spuitoplossing in die word gespuit word.

Kalibrasie moet soos volg gedoen word:

- Bepaal die tyd wat dit die trekker en planter neem om 100 meter te plant. Dit sal X minute wees.
- Gooi skoon water in die spuittenk en stel die spuittoerusting in werking vir X minute, soos hierbo bepaal, terwyl die water uit spuitkoppe terselfdetyd opgevang word. Al die spuitkoppe moet dieselfde hoeveelheid water lewer. Bepaal die gemiddelde lewering per spuitkop. Dit sal Y mℓ in X minute of Y mℓ per 100 meter rylengte lewer.
- Deel die gemiddelde lewering per spuitkop in die volume van die spuittenk vermenigvuldig met 1000, dus:

$\frac{\text{Volume van die spuittenk} \times 1000}{\text{Gemiddelde lewering per spuitkop in m}\ell}$	=	Aantal rye van 100 meter wat gespuit kan word.
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- Om die hoeveelheid **CARBOSTEM** wat per tenkvrug bygevoeg moet word te bepaal, vermenigvuldig die **CARBOSTEM** dosis, bv 50 mℓ/100 meter rylengte of 40 mℓ/100 meter rylengte, met die aantal rye (soos hierbo bepaal) wat gespuit kan word.
- Meng hierdie hoeveelheid **CARBOSTEM** met 'n gelyke hoeveelheid water. Meng deeglik en voeg mengsel in die spuittenk. Vul die tenk met skoon water tot verlangde vlak, terwyl roer.

**NOTA:** Verseker dat elke spuitkop minstens 450 mℓ oor die 100 meter afstand lewer. Op hierdie basis sal 'n spuittenk met 'n kapasiteit van 150 liter genoeg spuitoplossing hou vir 3 hektaar mielies wat in 0.9 meter rye geplant is.

## AANBEVELINGS

GEWAS/PLAAG	DOSIS	AANMERKINGS
<b>Mielies</b> Swart mieliekewer Stronkboorder Aalwurms Grondkalanders Bladspringer Valsdraadwurm	50 mℓ/100 m plantvoor in nie minder nie as 400 mℓ water.	Dien voorkomend toe en behoort stronkboorder vir tot 6 weke te beheer. In situasies waar minimum bewerking toegepas word, kan die plaag populasies hoër wees. In sulke omstandighede is dit noodsaaklik om beheer te monitor vanaf die eerste toediening, en herhaal toediening teen die aanbevole dosis indien nodig. Opvolg reën of besproeiing is noodsaaklik vir absorpsie en translokasie.
<b>Mielies</b> Aalwurms Grondkalanders Bladspringer Valsdraadwurm	40 mℓ/100 m plantvoor in nie minder nie as 400 mℓ water.	Sal swart mieliekewer en strokboorder onderdruk.
<b>Mielies</b> Grondkalanders ( <i>Protostrongylus</i> spp.)	10 mℓ/100 m plantvoor in nie minder nie as 2 ℓ water.	Grondkalanders sal eers gedood word nadat hulle gevreet het – gevolglik mag beperkte skade op die jong plante voorkom na toediening.
<b>Mielies</b> Mielie stronkboorder ( <i>Busseola fusca</i> )	420 mℓ <b>CARBOSTEM</b> / ha + 170 mℓ <b>LAMBADA</b> <b>AQUAMUL</b> / ha.	Vir optimale beheer, dien <b>CARBOSTEM</b> toe in tenkmengsel met 'n geregistreerde piretroïed soos <b>LAMBADA AQUAMUL</b> as 'n vroeë korrektiewe behandeling op jong larwes. Vir beste resultate, moet behandeling toegedien word voor die larwes binne kelke beweeg het. Moenie toedien op plante wat onder grootstres toestande groei nie. Die sistemiese aksie neem af in meer volwasse plante. Dien toe op gewasse wat aktief groeiend is en nie later as die pluimstoot stadium van die verskillende gewasse nie. <b>Grondtoediening:</b> Dien toe as 'n vroeë korrektiewe behandeling in 300 ℓ / ha wanneer die jong larwes gesien word en nie later as 10% skade op gewasse nie. 'n Tweede toediening 10 – 12 dae later mag nodig wees wanneer larwes groter as 10 mm of indien herinfestasië plaasvind. <b>Lugtoediening:</b> Soos bogenoem. Dien toe in 30 – 40 ℓ / ha.

### Opmerkings

- Vir korrektiewe beheer van *Protostrongylus* spp. (grondkalanders) in mielies, dien **CARBOSTEM** toe wanneer die eerste tekens van infestasië op die jong saailinge opgemerk word. Die spuit moet so opgestel word dat elke spuitkop 'n 300 mm wye strook oor die mieliery spuit. Om goeie bedekking te kry, kalibreer die spuit om 2 liter spuitoplossing per 100 meter rylengte te lewer.
- Vir vroeë korrektiewe beheer van 1ste en 2de generasië mielie stronkboorder (*Busseola fusca*) in mielies, dien **CARBOSTEM** in tenkmengsel met 'n geregistreerde piretroïed (b.v. **LAMBADA AQUAMUL** (L. 9583) of **ICHIBAN 100 EW** (L. 9248) ) met die eerste tekens van shot-hole skade op Suikermielies en wanneer 10% van die plante shot-hole skade wys in mielies. Volg alle instruksies vir gebruik op die betrokke piretroïed etiket.

<p style="text-align: center;"><b>Katoen</b></p> <p>Katoen plantluis (<i>Aphis gossypii</i>)</p>	<p>Dien 500 mℓ/ha toe vir plante tot 'n hoogte van 60 cm. Vir plante groter as 60 cm, dien 750 mℓ/ha toe.</p>	<p>Toedienings is gebaseer op verkenning. Dosis hang af van die fisiese plantgrootte. Dien toe in 100 ℓ/ha vir plante kleiner as 60 cm. Dien toe in 200 ℓ/ha vir plante groter as 60 cm. Begin toedienings wanneer plantluis in droëlandkatoen opgemerk word, of wanneer heuningdou in besproeide katoen opgemerk word.</p>
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**Opmerkings**

- Dien **CARBOSTEM** toe as 'n volle dekbepuiting in genoeg water sodat blare deeglik benat is (grondtoediening) en in 'n minimum van 50 liter water per hektaar (lugtoediening).

<p style="text-align: center;"><b>Wingerd</b></p> <p>Knopmyt (<i>Colomerus vitis</i>)</p>	<p>Dien 50 mℓ/100 ℓ water toe.</p>	<p>Dien drie bespuitings toe. Dien toe wanneer lote 5 tot 10 cm lank is en die tweede en derde toedienings met 14 dae tussenposes.</p>
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**Opmerkings**

- Knopmyte beweeg na nuwe groei vanaf hul oorwinteringslokaliteit. Toediening moet plaasvind tydens beweging.
- Kontak LNR-Infruitec Nietvoorbij vir die nuutste aanbevelings en verseker dat die toedienings aan uitvoer vereistes voldoen.

**ERKENNING VAN HANDELSMERKE**

**Ichiban 100 EW** (L. 9248)  
**Lambda aquamul** (L. 9583)

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