

Casoron

Dichlobenil (DBN)

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Mode of Action

Dichlobenil (DBN) inhibits the formation of cellulose in the plant cell walls. Cells lose their elasticity. They do not elongate but swell in all directions and then burst. At higher doses cell walls are not formed anymore. Dichlobenil therefore will only affect growing plant tissue not already established tissue.

DBN-soil characteristics

- The Casoron granule disintegrate when in contact with water, and DBN is released
- DBN is volatile, thus should be watered in after application
- The Casoron granule protect DBN to a certain extent from evaporation
- Volatility is temperature dependent and it is not recommended to apply Casoron above 65/70 F
- In soil DBN will partition between: soil water – soil air – soil particles
- Uptake of DBN by plants from soil occurs through the soil water
- DBN has the property to co-distill with water. Thus as water evaporates from soil DBN will go along with it. 1.4 gram of DBN can disappear in this way with 100 ml of soil water
- DBN also will disappear from soil through soil air
- The partition coefficient of DBN between water and air is 4000. This means that DBN will be forced into the water as long as it is in the soil air space. The solubility of DBN in water however is limited to a maximum of 18 ppm
- Adsorption to the soil strongly dependent on the soil OM content. $K=1.0(OM) + 0.5$; Maximal adsorption occurs at 10% OM; DBN will desorb from the soil according to the same equation. Adsorption is independent from clay content and $CaCO_3$
- Although in organic soils a greater part of DBN will be adsorbed to soil, as a result of its solubility DBN is still regarded as mobile in soil.
- The combined characteristics of DBN will cause DBN not to move much downward as well as laterally in soil. This however will depend on OM. As OM content decreases from 10%, more movement will occur
- Degradation of DBN is a microbial process.
- Half life of DBN is 1.5-12 months
- No effect from light or pH

Consequences for Casoron application.

Peat soils

- Water-in is necessary
- Restricted movement of DBN downward and laterally.
- Co-distillation and evaporation will occur
- Soil will hold a greater part of DBN
- No leaching of DBN.
- 100 lb/a Casoron 4G is adequate for weed control activity and avoiding crop phytotoxicity
- Depending on the weed infestation split applications may be considered

Sand

- Water-in is necessary
- Movement downward and laterally will occur
- Co-distillation and evaporation will occur
- Soil will hold DBN depending on OM
- More DBN is available at greater soil depth than in peat soils.

- Casoron rate should be adapted. Lower than 100 lb/a rate for efficacy and phytotoxicity. Maximum one application rate: ca.: 50lb/a
- Split applications should be considered

Sand soil + OM

- In sandy soil with more or less OM, DBN will behave in between peat soil and sand soil. Rates should be adapted accordingly.
- Small amounts of OM will already hold DBN
- OM may develop gradually during the years of cultivation. Behavior than will gradually change from sand soil to peat soil. Casoron application can be adapted.
- Rates will change from the 50 lb/a maximum to the 100 lb/a maximum

