

DDM DIATOMITE FOR INSECT CONTROL

TYPICAL PRODUCT SPECS:

PHYSICAL PROPERTIES		
ABSORPTION CAPACITY	H₂O	150-200%
DENSITY	LOOSE	0,15-0,25g/cc
PARTICLE SIZE	MEDIAN	12-15 um
	< 10 UM	33.30%
	< 45 UM	91.00%
	>106 UM	<1%
SPECIFIC SURFACE AREA	10-20M ² /g	

MAJOR CHEMICAL ELEMENTS	
SiO ²	86-89%
- Al ₂ O ₃	5-95%
- Fe ₂ O ₃	0-88%
CaO	0-10%
K ₂ O	0-63%
MgO	0-20%
Na ² O	0-32%
TiO ²	0-29%
H ₂ O	3-6%

MODE OF ACTION AND BENEFITS

The most widely accepted explanation for the action of diatomite is that it absorbs or removes the epicuticle lipid layers (which consist of hydrocarbons, wax esters, and other organic chemical compounds) of the insect. This causes excessive water loss through the cuticle of the insect and ultimately death by desiccation (dehydration) within 6 to 72 hours.

When applied correctly and at proper rates, many different species of orders of insects are listed and being susceptible to the action of diatomite. The following lists are not exhaustive:

- Store products: lesser grain borer, rice weevil, granary weevil, saw-toothed grain beetle, flat grain beetle, khopra beetle larvae, confused flower beetle, etc.
- Other insects: ants, beetles, borers, cockroaches, caterpillars, crickets, earwigs, flies, fleas, gnats, lice, ticks, silverfish, slugs, snails, spiders, weevils, etc.

Benefits of using **DDM** Diatomite include:

Natural, environment friendly control of insects.

- Odourless
- Because it is a physical action (not chemical) that causes death, insects cannot build up resistance to diatomite.
- Under dry conditions, effective use of diatomite may provide insect control of up to six months or more.
- Harmless to humans and animals, if digested.
- Diatomite will also act as a desiccant and keep stored grain dry.



Healthy Soil = Healthy Plants = Healthy People

APPLICATION RATES AND METHODS:

Livestock:

Apply as a dust (5g/m²) or spray (250g/l slurry) in stables, stock pens, poultry houses, dog kennels, etc. Repeat weekly or as required. As a dust on large surfaces diatomite is usually applied using powder dusters, sand blasting equipment aeration fans or simply through sprinkling by hand. When applying as slurry, be sure to keep the mixture agitated. Keep in mind that it will only be effective after drying.

Rub liberal amounts into animals' coats by hand to control fleas, lice, and other external pests. Treatment should be repeated as required. Good results have been reported by farmers hanging dust bags in doorways to barns and milking stables or from trees at watering places allowing animals to dust themselves. Similarly, dusting boxes with diatomite may be left in chicken pens for chickens to dust themselves.

Indoor:

Sprinkle a light layer of diatomite in areas when pests frequent, including under stoves, cabinets, sinks, garbage cans, window, and door frame sills, in between pet's bedding, sewer pipes and drains, and in cracks and crevices. Repeat treatment as needed to maintain adequate control.

Outdoor:

The following rates can be applied as a general insecticide:

Crops and pastures	Dust as a rate of 6 - 18 kg/ha (6 - 10 kg/hr in calm air)
Lawns	Dust as a rate of 5 g/m ²
Enclosed areas e.g., mushrooms	Dust as a rate of 3 - 5 g/m ²
Trees	Sprinkle liberally on the ground and around tree trunks. Trunks can also be painted with a 250g/l slurry.
Vegetables, citrus and soft fruit, flowers	Spray with 50 g/l slurry and also sprinkle around stems

More specific applications include:

- **Ants:** Disturb the ant hill with a rake or stick. Dust a generous amount directly on top of the nest contacting as many as possible and extend out about 1.5m from the nest. Reapply after rain once ground is dry.
- **Creating a crawling insect barrier:** Apply generously around the foundation of your house to create an insect barrier. Reapply after heavy rains.

Note: DDM Diatomite Concentrate contains a high amount of soluble silica (**120ppm**) which is highly beneficial to plants. Silica is a widely documented to stimulate Self Acquired Resistance (**SAR**) in plants. It strengthens the cuticular cell wall and imparts a stringer physical resistance to disease; in addition, diatomite contains small amounts of trace elements which are beneficial to plant growth.

Stored grain:

Always ensure that no insect infested grain debris is left in storage facilities or grain handling equipment prior to use. In facilities that are not properly cleaned, treatment with diatomite would be a waste of money. Diatomite may be applied to dried grains using several techniques.

- **Small lots** (20 - 100 kg) are heaped on a clean, flat surface and the recommended rate of 3 - 5 g/kg is measured and sprinkled on the surface using a metal, nylon, or cloth sieve (mesh size >60um) to ensure an even distribution. The diatomite is admixed by turning the grain with the help of a shovel. This application is suitable for situations where small quantities of grain need to be treated for storage in bags rather than bins or silo's (i.e., **small farmers in rural areas**).
- Grain can also be treated on the truck before it is unloaded into a dump pit from where it is elevated into the facility for storage. The recommended amount of 3 - 5 g/m² is sprinkled on the grain surface. The treated surface layer gets admixed with the untreated grain during off-loading and transfer into the storage facility.
- Grain can be treated **just before it enters the grain hopper, auger, and conveyor belts** by delivering diatomite (manually or with an applicator) at a rate of **20 g/m²**.



Untreated grain can be **top-dressed** at a rate of **20 - 100 g/m²** after loading into the storage facility, using a power duster, sand blasting gun or aeration fan. This treatment acts as a barrier and reduces insect infestation rates.

Untreated **grain in bags** can be protected from infestations by dusting the surface of the stacks at a rate of **20 - 100 g/m²**, as well as the internal surface area of storage facility at a rate of **5 g/m²**.

Empty storage bins can be dusted at a rate of **5 g/m²**.

Important Notes and Tips:

The most important factors to be taken into account when using diatomite for pest control are: -

The insect species targeted;

The amount used and application method;

Kind and condition (including moisture content) of grain being treated;

Storage areas and grain handling equipment must be cleaned prior to re-use in order to deprive insects' food;

Ambient relative humidity and temperature.

Diatomite will only provide excellent insect protection/control if all the above criteria have been adhered to.

Insect morphology and physiology to be considered:

Surface area to volume ratio (small sized insects more susceptible);

Thickness and hardness of cuticular wax layers (the thicker and harder the layer, the longer diatomite will take to kill);

Sucking/non-sucking species (some sucking insects e.g. large ticks sometimes manage to replace lost water fast enough to prevent death);

Ability to replenish lost moisture from ambient atmosphere;

Hairiness (hairy insects are less susceptible to diatomite);

Internal/external feeders (internal feeders spend the majority of their immature stage inside the kernel and is therefore less exposed to diatomite).

Access to food:

Water loss by the action of diatomite on insects can be replenished by digesting and metabolising of food.

Grain type and condition:

The ability of kernels to retain diatomite on its surface is crucial;

Grain should not be infested prior to treatment with diatomite;

Grain temperature and moisture content (high temperature and low moisture (<13%) enhance efficiency;

On cracked grain/milled flour, the efficacy of diatomite is greatly diminished.

Relative humidity (RH):

Below an ambient 70% RH, the diatomite's effectiveness is markedly increased.

Method of treatment:

As diatomite is not a poison but kills by physical means, proper application is essential.

For grain storage the method must optimise on the: -

percentage of kernel surface treated;

rate of degree of coverage;

amount diatomite retained on the kernels/surfaces; and

efficacy and extent of isolation provided by diatomite dusting to stored grain products in bulk (bags/silos/ bins).



HEALTH / SAFETY

Natural diatomite powdered products consist almost entirely of amorphous silica (**SiO²**) but may contain small amounts (<4%) of crystalline silica in the form of quartz. While diatomite is 100% natural and non-toxic, crystalline silica (unlike amorphous silica which is a confirmed human carcinogen). Because of this it can cause lung problems in breathed in heavily for extended periods. Always wear a dust mask or stand up-wind when applying it dry. There is no other downside as it is a natural inorganic inert non-toxic substance.

CONTACT DETAILS:

For further information or to order, please contact:

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