



## GRAIN ELEVATOR IPM

Grain insects are difficult to find by conventional methods and many times infested grain enters the elevator undetected. With infested grain in silos and infested residues in or under conveyors, equipment and many other locations, there are many opportunities for insects to access grain that would otherwise remain free from infestation.

**Protect-It®** stored grain insecticide can help reduce insect problems in the elevator. **Protect-It®** can be used by elevator personnel (no licensing necessary) as both a structural and stored grain insecticide.

### Structural Application

Priority should be given to treating empty silos and areas in the elevator, which can harbor residual populations of insects. **As the silos become empty use the aeration fan or compressed blower to apply **Protect-It®** (dry) to the entire bin at 5 g/m<sup>2</sup> (454 g/1000 ft<sup>2</sup>).** It is best to wait several days for **Protect-It®** to eradicate all the insects. There is no need to enter the silo and application will take less than 2 minutes. For a cylindrical silo, the amount **Protect-It®** required is:

$$2.85 \times \text{silos radius(ft.)} \times \text{height(ft.)} = \text{grams of Protect-It®}$$

**Protect-It®** is also ideal for areas in the elevator which can harbor insects. Using a small nozzle duster, fill cracks, crevices and smaller voids with **Protect-It®** to avoid reoccurring infestation. For general application to surfaces after cleaning, use a dust blower (i.e. Hedley's compressed air applicator) to apply **Protect-It®** at a rate of 5 g/m<sup>2</sup> (454 g/1000 ft<sup>2</sup>).

### Stored Grain (silos and metal bins)

**OPTION A** (long-term protection from weevils, flour beetles, grain beetles and Indian meal moth)

Treat the entire grain mass at the application rates on the label, then blow or sprinkle **Protect-It®** over the surface of the grain at the rate of 20 g/m<sup>2</sup> (1.86 kg/1000 ft<sup>2</sup>). For Indian meal moth use a surface application rate of 100 g/m<sup>2</sup> (9.30 kg/1000 ft<sup>2</sup>). To calculate the surface treatment amount, square the radius of the bin and multiply by 3.14. Using a bin with a 10-foot radius:

$$\text{Square feet} = (10)^2 \times 3.14 = 314$$

Take square footage, divide by 1000 and multiply by the rate of 9.30 kg/1000 ft<sup>2</sup> (rate for Indian meal moth):

$$314/1000 \times 9.30 = 2.9 \text{ kg}$$

For a peaked pile, add 30% to this total:

$$2.9 \text{ kg} + 30\% = \underline{3.8 \text{ kg}}$$

**OPTION B** (short-medium term protection from weevils, flour beetles, grain beetles and Indian meal moth)

Preliminary research has shown that more than 90% of insects in a concrete silo tend to inhabit the bottom portion of the grain mass. Before filling the silo, blow or sprinkle in one 5 kg case of **Protect-It®** so that it covers the bottom of the silo (cone). As the silo is filled, the force of the falling grain will disperse **Protect-It®** throughout the bottom several feet of the grain mass.

After the silo has been filled blow or sprinkle **Protect-It®** over the surface at the rate of  $100 \text{ g/m}^2$  ( $9.30 \text{ kg}/1000 \text{ ft}^2$ ).

For silos equipped with aeration, use the fan to blow some **Protect-It®** into the aeration system to prevent insect entry into the grain mass.

## Stored Grain (metal bins)

**OPTION C** (short-medium term protection from weevils, flour beetles, grain beetles)

At the rate of 300 g/ton, treat only the top 3-feet of the grain in the bin. After treating the top 3 feet, blow **Protect-It®** over the surface of the grain mass at the rate of  $20 \text{ g/m}^2$  ( $1.86 \text{ kg}/1000 \text{ ft}^2$ ). For taller bins (18 feet or higher), treat the bottom 3-feet as well. As an alternative to bottom layer treatment, blow some **Protect-It®** into the aeration system to prevent insect entry into the grain mass.

To calculate the number of tons in a 3-foot layer, square the radius of the bin and multiply by the following factor for the type of grain:

Wheat	0.2052
Barley	0.1625
Oats	0.1154
Rye	0.1881

For example, for a bin of wheat with a 10 foot radius (radius is ½ bin diameter):

$$\text{Tons} = (10)^2 \times 0.2052 = 100 \times 0.2052 = 20.52$$

To treat one 3-foot layer of wheat, you require:

$$20.52 \times 300\text{g} = \underline{6156 \text{ g or } 6.15 \text{ kg}}$$

## Flat Storage

For flat storage, treat the empty storage before filling at the rate of  $5 \text{ g/m}^2$  ( $454 \text{ g}/1000 \text{ ft}^2$ ). After filling, blow **Protect-It®** over the surface of the grain mass at the rate of  $100\text{g}/\text{m}^2$  ( $9.30 \text{ kg}/1000 \text{ ft}^2$ ). To calculate surface area, take the floor area and add 30% for grain in a peaked pile.