Protect-It®
The Natural Choice
STORED GRAIN INSECTICIDE & EMPTY BIN TREATMENT

Fact Sheet

BACKGROUND

- Public perception of food safety increasingly important
- Applicator safety is a primary concern for pesticide applicators
- To conserve value of grain it is necessary to protect it from insects
- Need for pesticides that are safe and effective with no residue concerns
- Limited stored product insecticides are currently available
- Government regulations may restrict the availability and use of chemical stored grain insecticides and fumigants in the future
- Absolutely no odour and no need for expensive safety equipment (dust mask and goggles)

PROTECT-IT®

- Latest generation Diatomaceous Earth (DE)-based pesticide
- Made of DE and silica gel, which are both forms of amorphous silica
- Absorbs waxy coating from insect body causing water loss and death
- Recommended at lowest doses of any DE product
- Made specifically for use in grain and grain handling and food processing facilities
- Effective structural and grain insecticide
- Excellent IPM tool, which can be considered a direct or indirect alternative to stored grain chemical insecticides

BENEFITS

- No need to worry about chemical residues or food safety
- No applicator certification or special storage provisions necessary
- No waiting period after application of Protect-It®
- Safe to applicator, grain handlers, processors and consumers
- Very persistent, will not degrade or dissipate so long as the grain is in storage
- Broad spectrum of pests, including weevils, rusty grain beetles and flour beetles
- No need to cover or clean food processing equipment during or after application of Protect-It®
- Will not affect milling, baking or malting quality
- Can be used in or around animal feeds
- Certified Organic

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APPLICATION

- Easy and inexpensive for empty bin application before loading
- Mass treatment suitable for very long term storage or for finished product
- Layer treatment plus top dressing suitable for standard protection for on-farm or commercial storage
- Top dressing compatible with flat storage or for after "coring" bins
- Crack and crevice and general structural treatment for processing facilities

APPLICATION EQUIPMENT

- Easily applied to empty bins using bin aeration equipment or Hedley's Air Application Kit
- For application to grain, can be applied by hand as grain is conveyed
- For larger commercial-scale application, automatic feeders are available
- Air driven Air Application Kit used for top dressing
- Bulb dusters, Air Applicator or electric blowers suitable for processing facilities

RESEARCH

- Agriculture and Agri-Food Canada – wheat and barley field trials
- Oklahoma State-empty bin treatment and treatment of peanuts
- Purdue-empty bin treatment
- USDA and Agriculture and Agri-Food Canada-heat/Protect-It® for flour mills
- Laboratory testing conducted by USDA, Minnesota State, Oklahoma State
- Field tested in Eastern Europe, Asia and North America
- Generally acknowledged by research community as the most effective DE pesticide in North America

WHO SHOULD USE PROTECT-IT®?

- Farmers for application to empty bins and protection of grain on farm
- Commercial elevators for application to empty silos and flat storage and for application to grain (food or feed) destined for medium to long-term storage
- Food processors for structural application, e.g., crack and crevice treatment and application to grains in-store
- Food processors, pet food manufacturers for occasional Protect-It®/heat combination treatment as a replacement for facility fumigation
- Birdseed processors for direct application of Protect-It® to finished product
- Food warehouses for general structural application

For more information contact…

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Comparing Protect-It®

Principal differences between Protect-It® and Malathion Grain Dust:

- Protect-It® maintains its effectiveness for as long as it is in the grain. Because it is a chemical Malathion's effectiveness diminishes over time.
- Malathion leaves a chemical residue on treated grain, Protect-It® does not.
- Because of restrictions from many of Canada's customers regarding chemical residues, the Canadian Grain commission "encourages producers and grain handlers to consider using other control strategies before choosing to apply Malathion directly to grain".
- Protect-It® is a food safe dust that kills insects through dehydration. Malathion is a poison and therefore requires more care in handling, application and disposal of containers.
- Protect-It® is effective against storage moths (e.g. Indian Meal Moth), Malathion is not.
- Malathion has been around a long time and is showing its age. Insects have become resistant to Malathion. This is not the case for Protect-It®.
- The Canola Council is recommending against Malathion use in bins that store canola.
- Protect-It® is odourless. Malathion has a strong unpleasant odour.

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Features	Benefits
ENHANCED DIATOMACEOUS EARTH	*The combination of highly insecticidal diatomaceous earth and silica provides greatly improved performance over other diatomaceous earth insecticides.*
NON-TOXIC	*The ingredients in Protect-It® are used as food additives and as filtration agents for beverages. It is safe for humans, animals and the environment.*
NO CHEMICAL RESIDUES ON FOODS	*Protect-It® is not a chemical poison and does not leave chemical residues on foods. There are no residue limits for Protect-It® on grains*.
EASY TO APPLY	*Protect-It® can be blown on to surfaces using compressed air or aeration fans. It can be applied to grain as it is conveyed into storage.*
SAFE TO APPLY	*Special applicator certification or training is not required. A simple dust mask is the minimum safety equipment.*
EFFECTIVE	*Protect-It® was designed for use in stored grain and is recommended at the lowest rates for all diatomaceous earth grain insecticides.*
BROAD SPECTRUM	*Protect-It® works effectively on almost all storage pests.*
FLEXIBLE	*Protect-It® can be applied as both structural and grain insecticide to silos, horizontal storage, warehouses, shipping containers and food processing facilities*.
LONG LASTING	*Contrary to chemical pesticides, Protect-It® will not degrade. It remains effective so long as it is present.*
NO WAITING PERIOD	*If desired, grain can be processed or fed to livestock immediately after treatment.*
NO EFFECT ON GRAIN END USE QUALITIES	*Protect-It® will not affect milling, baking, malting or seed germination.*

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On-Farm Application of Protect-It®

Protect-It® is a non-chemical structural and stored grain insecticide powder created exclusively for use in and around stored grains and seeds. **Protect-It®** is made entirely of diatomaceous earth (Figure 1) and silica gel. These non-toxic materials stick to the insect (Figure 2) causing it to lose water and die. Because of its low application rates, this unique (patented) combination of materials provides the most cost effective product of its kind in North America.

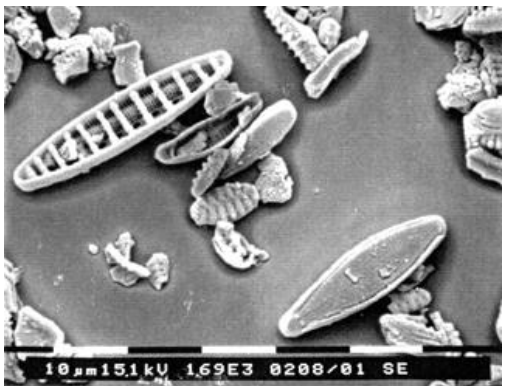

Figure 1. Diatomaceous Earth (DE) 90x magnification

Figure 2. DE on insect skin 440X magnification

ALWAYS READ AND FOLLOW LABEL DIRECTIONS

Protect-It® provides the following benefits . . .

- Safe for users, grain handlers and consumers
- No chemical residues on treated grains
- No applicator certification or special storage provisions required
- Works on a broad range of storage pests, including **rusty grain beetles, weevils, flour beetles, Indian meal moth**
- Very long-lasting-will not degrade so long as treated grain is in storage
- Will not affect germination, milling, baking or malting quality
- Can be used in and around animal feeds
- No waiting period after application of **Protect-It®**
- Odorless
- Proven technology
- Registered for all grains and seeds

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For the protection of farm-stored grain, follow ALL 3 steps (below):

Step One

Empty Bin Treatment: 1-2 weeks before harvest clean your empty bins and apply **Protect-It®** at the rate of *5 g/square meter (454 g/1000 square feet)* to all interior surfaces.
Apply **Protect-It®** to the empty bin using either your aeration fan (Figure 3) or a dust blower (Figure 4).

Calculation
To begin, find out the diameter (ft.) of the bin and the height of the bin to the eaves. For this calculation you need to determine the radius of the bin, which is ½ the diameter.

A. Floor area = Radius x Radius x 3.14
B. Ceiling = take floor area and add 30% (for peaked roof)
C. Wall area = Radius x Height to eaves x 6.29
Add areas of floor, ceiling and walls to determine total area.
First divide total area by 1000 and then multiply this number by 0.454 to determine the amount of Protect-It® (kg) required to treat the empty bin.

Figure 3. Aeration fan application

Figure 4. Compressed air duster

Step Two

Grain mass application: Apply **Protect-It®** to **uninfested** grain **immediately** at harvest as grain is being augered into the bin. (Do not store new crop on top of old crop.) After calculating the amount of **Protect-It®** required, apply to grain directly at the auger (Figure 5) or use the truck method as follows:

- After calculating the required amount of **Protect-It®** required to treat the entire truckload of grain, take half of this amount and spread as evenly as possible over the entire surface of the grain in the truck (Figure 6).

- After the truck is about half empty, evenly spread the remaining **Protect-It®** over the surface of the grain remaining in the truck (Figure 7)**.**

See the label for application rates. For example, for a 10 metric ton truck load of wheat, at the rate for wheat of 100 grams per metric ton, you would apply 1000 grams or 1.0 kg. Every 250 mL cup of **Protect-It®** weighs about 50 g, so for this truckload about 20 cups or 5 Liters of **Protect-It®** are required.

Figure 5. Protect-It® being applied at the auger

ALWAYS READ AND FOLLOW LABEL DIRECTIONS

Figure 6. Use ½ amount of Protect-It® to cover surface of full load

Figure 7. Use remaining ½ Protect-It® to cover surface of ½ load

Step Three

Surface Dressing: Blow or sprinkle **Protect-It®** over the surface of the grain mass in the bin at the rate of 20 g/square meter (*1.86 kg/1000 square feet*).

Calculation

Take ceiling area (see calculations for Step One) and divide this by 1000. Multiply this number by 1.86 to give the amount (kg) of **Protect-It®** for surface dressing.

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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^2 (454 g/1000 ft^2).*** 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 x silo radius(ft.) x height(ft.) = 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^2 (454 g/1000 ft^2)*.

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^2 (1.86 kg/1000 ft^2).* For Indian meal moth use a surface application rate of *100 g/m^2 (9.30 kg/1000 ft^2).* 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:

Square feet = (10)^2 x 3.14 = 314

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Take square footage, divide by 1000 and multiply by the rate of *9.30 kg/1000 ft²* (rate for Indian meal moth):

314/1000 x 9.30 = 2.9 kg

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

2.9 kg + 30% = <u>3.8</u> 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 g/m² (9.30 kg/1000 ft²)*.

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.

<u>Stored Grain (metal bins)</u>

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 g/m² (1.86 kg/1000 ft²)*. 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):

Tons = $(10)^2$ x 0.2052 = 100 x 0.2052 = 20.52

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

20.52 x 300g = <u>6156 g or 6.15 kg</u>

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Flat Storage

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

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Capacity (bushels)	Diameter (feet)	Height (feet)	Roof height (feet)	Total area (square. feet.)	Amount (grams)
1823	15'	11'-0"	4'-3"	899	418
2367	15'	14'-8"	4'-3"	1071	498
2911	15'	18'-4"	4'-3"	1244	578
2682	18'	11'-0"	5'-2"	1170	544
3465	18'	14'-8"	5'-2"	1378	640
4248	18'	18'-4"	5'-2"	1585	737
5031	18'	22'-0"	5'-2"	1793	833
5814	18'	25'-8"	5'-2"	2000	929
6597	18'	29'-4"	5'-2"	2208	1026
7380	18'	33'-0"	5'-2"	2415	1122
8163	18'	36'-8"	5'-2"	2622	1219
8946	18'	40'-4"	5'-2"	2830	1315
9729	18'	44'-0"	5'-2"	3037	1411
10512	18'	47'-8"	5'-2"	3245	1508
11295	18'	51'-4"	5'-2"	3452	1604
12078	18'	55'-0"	5'-2"	3660	1701
12860	18'	58'-8"	5'-2"	3867	1797
13643	18'	62'-4"	5'-2"	4074	1893
14426	18'	66'-0"	5'-2"	4282	1990
15209	18'	69'-8"	5'-2"	4489	2086
15992	18'	73'-4"	5'-2"	4697	2182
16775	18'	77'-0"	5'-2"	4904	2279
17558	18'	80'-8"	5'-2"	5112	2375
18341	18'	84'-4"	5'-2"	5319	2472
3727	21'	11'-0"	6'-0"	1472	684
4793	21'	14'-8"	6'-0"	1714	796
5857	21'	18'-4"	6'-0"	1956	909
6924	21'	22'-0"	6'-0"	2198	1021
7990	21'	25'-8"	6'-0"	2440	1134
9056	21'	29'-4"	6'-0"	2682	1246
10121	21'	33'-0"	6'-0"	2924	1359
11187	21'	36'-8"	6'-0"	3166	1471
12253	21'	40'-4"	6'-0"	3408	1583
13319	21'	44'-0"	6'-0"	3650	1696
14384	21'	47'-8"	6'-0"	3892	1808
15450	21'	51'-4"	6'-0"	4134	1921
16516	21'	55'-0"	6'-0"	4376	2033
17581	21'	58'-8"	6'-0"	4618	2146
18647	21'	62'-4"	6'-0"	4860	2258
19713	21'	66'-0"	6'-0"	5102	2371
20778	21'	69'-8"	6'-0"	5344	2483
21844	21'	73'-4"	6'-0"	5586	2596
22910	21'	77'-0"	6'-0"	5828	2708
23976	21'	80'-8"	6'-0"	6070	2820
25041	21'	84'-4"	6'-0"	6312	2933

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Capacity (bushels)	Diameter (feet)	Height (feet)	Roof height (feet)	Total area (square. feet.)	Amount (grams)
4969	24	11'-0"	6'-10"	1803	838
6361	24	14'-8"	6'-10"	2080	966
7752	24'	18'-4"	6'-10"	2356	1095
9144	24'	22'-0"	6'-10"	2633	1223
10536	24'	25'-8"	6'-10"	2909	1352
11928	24'	29'-4"	6'-10"	3186	1480
13320	24'	33'-0"	6'-10"	3463	1609
14712	24'	36'-8"	6'-10"	3739	1737
16104	24'	40'-4"	6'-10"	4016	1866
17496	24'	44'-0"	6'-10"	4292	1995
18888	24'	47'-8"	6'-10"	4569	2123
20280	24'	51'-4"	6'-10"	4845	2252
21672	24'	55'-0"	6'-10"	5122	2380
23064	24'	58'-8"	6'-10"	5398	2509
24456	24'	62'-4"	6'-10"	5675	2637
25848	24'	66'-0"	6'-10"	5952	2766
27240	24'	69'-8"	6'-10"	6228	2894
28632	24'	73'-4"	6'-10"	6505	3023
30024	24'	77'-0"	6'-10"	6781	3151
31415	24'	80'-8"	6'-10"	7058	3280
32807	24'	84'-4"	6'-10"	7334	3408
6415	27'	11'-0"	7'-9"	2167	1007
8177	27'	14'-8"	7'-9"	2478	1151
9939	27'	18'-4"	7'-9"	2789	1296
11700	27'	22'-0"	7'-9"	3100	1441
13462	27'	25'-8"	7'-9"	3411	1585
15224	27'	29'-4"	7'-9"	3722	1730
16985	27'	33'-0"	7'-9"	4034	1874
18747	27'	36'-8"	7'-9"	4345	2019
20509	27'	40'-4"	7'-9"	4656	2163
22270	27'	44'-0"	7'-9"	4967	2308
24032	27'	47'-8"	7'-9"	5278	2453
25794	27'	51'-4"	7'-9"	5589	2597
27556	27'	55'-0"	7'-9"	5900	2742
29317	27'	58'-8"	7'-9"	6211	2886
31079	27'	62'-4"	7'-9"	6523	3031
32841	27'	66'-0"	7'-9"	6834	3176
34602	27'	69'-8"	7'-9"	7145	3320
36364	27'	73'-4"	7'-9"	7456	3465
38126	27'	77'-0"	7'-9"	7767	3609
39887	27'	80'-8"	7'-9"	8078	3754
41649	27'	84'-4"	7'-9"	8390	3898
8077	30'	11'-0"	8'-7"	2559	1189
10252	30'	14'-8"	8'-7"	2905	1350
12427	30'	18'-4"	8'-7"	3250	1510

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Capacity (bushels)	Diameter (feet)	Height (feet)	Roof height (feet)	Total area (square. feet.)	Amount (grams)
14602	30'	22'-0"	8'-7"	3596	1671
16777	30’	25’-8’’	8’-7’’	3942	1832
18952	30'	29'-4"	8'-7"	4288	1992
21127	30'	33'-0"	8'-7"	4633	2153
23301	30'	36'-8"	8'-7"	4979	2314
25476	30'	40'-4"	8'-7"	5325	2474
27651	30'	44'-0"	8'-7"	5670	2635
29826	30'	47'-8"	8'-7"	6016	2796
32001	30'	51'-4"	8'-7"	6362	2956
34176	30'	55'-0"	8'-7"	6708	3117
36351	30'	58'-8"	8'-7"	7053	3278
38526	30'	62'-4"	8'-7"	7399	3438
40701	30'	66'-0"	8'-7"	7745	3599
42876	30'	69'-8"	8'-7"	8090	3759
45051	30'	73'-4"	8'-7"	8436	3920
47225	30'	77'-0"	8'-7"	8782	4081
49400	30'	80'-8"	8'-7"	9128	4241
51575	30'	84'-4"	8'-7"	9473	4402
9963	33'	11'-0"	9'-10"	2993	1391
12595	33'	14'-8"	9'-10"	3373	1567
15226	33'	18'-4"	9'-10"	3753	1744
17858	33'	22'-0"	9'-10"	4133	1921
20490	33'	25'-8"	9'-10"	4514	2097
23121	33'	29'-4"	9'-10"	4894	2274
25753	33'	33'-0"	9'-10"	5274	2451
28385	33'	36'-8"	9'-10"	5655	2628
31016	33'	40'-4"	9'-10"	6035	2804
33648	33'	44'-0"	9'-10"	6415	2981
36279	33'	47'-8"	9'-10"	6795	3158
38911	33'	51'-4"	9'-10"	7176	3334
41543	33'	55'-0"	9'-10"	7556	3511
44174	33'	58'-8"	9'-10"	7936	3688
46806	33'	62'-4"	9'-10"	8317	3865
49438	33'	66'-0"	9'-10"	8697	4041
52069	33'	69'-8"	9'-10"	9077	4218
54701	33'	73'-4"	9'-10"	9457	4395
57333	33'	77'-0"	9'-10"	9838	4571
59964	33'	80'-8"	9'-10"	10218	4748
62596	33'	84'-4"	9'-10"	10598	4925
12083	36'	11'-0"	10'-5"	3439	1598
15215	36'	14'-8"	10'-5"	3854	1791
18347	36'	18'-4"	10'-5"	4269	1984
21478	36'	22'-0"	10'-5"	4684	2177
24610	36'	25'-8"	10'-5"	5099	2369
27742	36'	29'-4"	10'-5"	5514	2562

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Protect-It®
The Natural Choice
STORED GRAIN INSECTICIDE & EMPTY BIN TREATMENT

EMPTY BIN APPLICATION AMOUNTS

Capacity (bushels)	Diameter (feet)	Height (feet)	Roof height (feet)	Total area (square. feet.)	Amount (grams)
30874	36’	33’-0”	10’-5”	5928	2755
34006	36	36’-8”	10’-5”	6343	2948
37138	36'	40'-4"	10'-5"	6758	3140
40270	36'	44'-0"	10'-5"	7173	3333
43401	36'	47'-8"	10'-5"	7588	3526
46533	36'	51'-4"	10'-5"	8003	3719
49665	36'	55'-0"	10'-5"	8418	3912
52797	36'	58'-8"	10'-5"	8832	4104
55929	36'	62'-4"	10'-5"	9247	4297
59061	36'	66'-0"	10'-5"	9662	4490
62193	36'	69'-8"	10'-5"	10077	4683
65324	36'	73'-4"	10'-5"	10492	4875
68456	36'	77'-0"	10'-5"	10907	5068
71588	36'	80'-8"	10'-5"	11322	5261
74720	36'	84'-4"	10'-5"	11736	5454
17061	42'	11'-0"	12'-1"	4437	2062
21324	42'	14'-8"	12'-1"	4921	2287
25586	42'	18'-4"	12'-1"	5405	2512
29849	42'	22'-0"	12'-1"	5889	2737
34112	42'	25'-8"	12'-1"	6373	2961
38375	42'	29'-4"	12'-1"	6857	3186
42638	42'	33'-0"	12'-1"	7341	3411
46901	42'	36'-8"	12'-1"	7825	3636
51163	42'	40'-4"	12'-1"	8309	3861

2 CUPS = 100 GRAMS Protect-It®

Hedley Technologies Ltd.
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MATERIAL SAFETY DATA SHEET – Protect-It®

***Personal Protection*: If frequently exposed to airborne dust, wear a dust mask such as NIOSH 95 Particulate series or equivalent. Use goggles and/or gloves if eye and/or skin irritation occurs.**

HMIS/NFPA Codes: HEALTH – 1 FLAMMABILITY – 0 REACTIVITY – 0 Protection – E

SECTION 1 – PRODUCT IDENTIFICATION AND USE

Product Identifier: **Protect-It®**		**Health Canada PCP No. 24259**	
Product Use: Insecticide for use in stored grain and structures			
Manufacturer's Name: Hedley Technologies Ltd.		Supplier's Name:	
Address: 170 Attwell Drive, Suite 520, Toronto, ON		Address:	
Postal Code: M9W 5Z5		Postal Code	
Tel: 1-888-476-4473	Fax: 905-206-1413	Tel:	Fax:

SECTION 2 – INGREDIENTS

Ingredient	w/w%	CAS Number
Chemical name: Amorphous silicon dioxide*		
Natural Diatomaceous Earth ï Fresh Water (DE)*	90%	61790-53-2
Silica Gel*	10%	112926-00-8
* Total crystalline silica content is <0.9%		
	Total Dust PEL	**Respirable Dust TWA**
Amorphous silicon dioxide	10 mg/m^3	5 mg/m^3

SECTION 3 – PHYSICAL DATA

Physical State:	Fine off-white powder	Odour:	None
Vapour Pressure:	NA	Freezing Point(□C):	NA
Water Solubility:	Negligible	Boiling Point(□C):	NA
Specific Gravity (water =1):	2	% Volatiles by Volume:	ND
pH:	6 - 8	Evaporation Rate:	NA
Melting Point	NA	Bulk Density	190 g/L

SECTION 4 – FIRE AND EXPLOSION DATA

Flammability	Not flammable
Combustibility	Not combustible
Unusual Fire or Explosion Hazards	Not explosive

SECTION 5 – REACTIVITY DATA

Chemical Stability:	Material is stable and chemically inert.
Incompatibilities with other substances:	Soluble in hydrofluoric acid
Hazardous Products of Decomposition:	NA
Conditions to avoid:	None in designed use

SECTION 6 – TOXICOLOGICAL PROPERTIES

Primary Route of Entry: Inhalation ☒

Other Route of Entry: Eye contact ☒ Ingestion ☒ Skin absorption: NA Skin contact: NA

Inhalation: Mechanical irritant. May cause coughing, sneezing and soreness to throat and nose. In extreme exposures some respiratory congestion may occur.

Eye Contact: Mechanical irritant. May cause temporary irritation or inflammation

Skin Contact: Oil absorbent. May cause drying of the skin.

Ingestion: Not hazardous when ingested.

Personal Hygiene / Work Practices: Establish good personal hygiene and work practices. Always wash hands and face before eating, drinking or smoking.

SECTION 6 – TOXICOLOGICAL PROPERTIES (continued)	
Chronic Exposure: This product contains natural (uncalcined) diatomaceous earth (fresh water source) and synthetic amorphous silica which are considered health hazards when inhaled over long periods of time (years). Long term inhalation of these materials can cause silicosis, a noncancerous lung disease. Use of a dust mask during application prevents this hazard.	
Sensitization to product:	ND
Irritancy of product:	Transitory upper respiratory irritant (mechanical irritant)
Reproductive Effects:	None
Teratogenicity:	None
Mutagenicity:	None
Synergistic Products:	None
SECTION 7 – EXPOSURE CONTROLS/PERSONAL PROTECTION	
Eyewear	Safety glasses with side shields or goggles recommended
Footwear	NA
Respirator (dust mask)	Use NOISH/MSHA TC-21C-132 or equivalent for commercial application
Gloves and protective clothing	Gloves, long pants and long sleeves recommended if skin irritation occurs.
Engineering Controls (Ventilation)	Use sufficient natural or mechanical ventilation to keep dust level below PEL (Section 2).
Leak & Spill Procedure	Vacuum clean dust with equipment fitted with HEPA filter, use a dust suppressant such as water if sweeping is necessary.
Waste Disposal	Waste is not hazardous as defined by RCRA (40 CFR 261). If this product absorbs chemicals or other liquids it should be disposed of in an approved landfill. Comply with federal, provincial, and local regulations.
Handling & Storage Procedures	Store in a dry place. Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with eyes. Seal broken containers immediately. When working with this product, measures to prevent electrostatic charging should always be taken when handling near flammable or explosive atmospheres. Continue to follow all MSDS/label warnings when handling empty containers.
Special Shipping Information	NA
SECTION 8 – FIRST AID MEASURES	
If eye irritation occurs, hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes then continue rinsing eye. Call a poison control centre or doctor for treatment advice. If inhaled, move person to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration, preferably by mouth-to mouth, if possible. Call a poison control centre or doctor for further treatment advice.	
SECTION 9 – ECOLOGICAL INFORMATION	
Generally considered chemically inert in the environment. It is not toxic to plants or animals (except insects, arachnids and land gastropods when dry). Used material which has become contaminated may have significantly different characteristics based on the contaminant and should be evaluated accordingly.	
SECTION 10 – REGULATORY INFORMATION	
WHMIS:	Not regulated
Ingredient Disclosure List:	Not listed
Environmental Protection Act:	Listed on Non-Domestic Substance List (NDSL)
Classified according to Controlled Products Regulations ï not a carcinogen.	
SECTION 11 – PREPARATION DATE OF MSDS	
Prepared by Hedley Technologies Ltd. www.hedleytech.com	Date: December 15, 2015

NA = not applicable ND = not determined

END OF MSDS

DIRECTIONS FOR USE

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on this label. It is an offence under the Pest Control Products Act to use a control product under unsafe conditions. The user assumes the risk to persons or property that arises from any such use of this product.

Protect-It® is approved for use on the following stored products: feed grains, seed, wheat, barley, buckwheat, corn, oats, rye, flax, peas, soybeans and sorghum. After storage, grain can be used as intended without removal of Protect-It®.

Protect-It® is approved for use for the following stored product insects: rusty grain beetle, rice weevil, granary weevil, Indian meal moth, Mediterranean flour moth, Angoumois grain moth, red flour beetle and Tribolium.

Protect-It® can be used in dry empty containers where grain is transported or stored, such as silos, grain elevators, food and/or feed processing facilities, rail cars, ships, trucks, trailers, as well as appropriate cans, drums and packages. The structure must remain empty for 1-2 weeks. For maximum effectiveness the relative humidity must remain below 55%, and the temperature above 15°C.

General, spot, and crack and crevice treatment: Protect-It® can be applied as a dust or in a slurry. As a dust Protect-It® is best used in dry, empty structures. Use a dust blower to place Protect-It® into the cracks and crevices of the structure. For treatment of surfaces, spot treatments, or exterior application, Protect-It® can be applied either as a dust so that residues are about 5 g/m^2, or as a slurry application so that residues are about 7 g/m^2. Surfaces include such areas as walls and floors, whereas spot treatments are areas smaller than about 1.5 - 2.0 m^2. For applications as a slurry, thoroughly mix 1.4 kg of Protect-It® with 10 litres of water. Use 0.5 litres of mixture per 10 m^2, or 5 litres per 100 m^2, so that Protect-It® residues are 7 g/m^2. For vertical surfaces, Protect-It® can be applied as a slurry so that residues are about 7 g/m^2.

Treatment for stored grain: Protect-It® may be applied to grain at any stage of preparation or transportation after drying and cleaning, and prior to storage. Dust should be mixed thoroughly with all grain to be stored. Protect-It® may be applied to grain as it enters the auger or conveyor feeder system during transfer of grain into storage facilities or into transportation containers.

Commodity	Rate of Protect-It per metric ton (g/tonne)	
	Rusty grain beetle	Other listed insects
Wheat	100	500
Barley	150	500
Oats, Buckwheat, Peas Rye, Flax, Soybeans	500	500
Feed grains, Seed, Corn, Sorghum	1000	1000

To control accessible stages of Indian meal moth, Mediterranean flour moth and Angoumois grain moth: Apply to surface of binned grain at the rate of 500 g/100 m^2. Apply at monthly intervals with the first appearance of moths and continue until early fall. In severe infestations break up webbing with a rake before dusting and make second application within two weeks.

Protect-It®

Ready-to-Use Insecticidal Dust

For Insect Control in Stored Grain, Warehouses and Processing Facilities

Hedley Technologies Ltd.

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GUARANTEE

Silicon Dioxide present as 100% Diatomaceous Earth 74%
Silica Aerogel 10%

COMMERCIAL - AGRICULTURAL
READ THE LABEL BEFORE USING
REGISTRATION NO. 24259
PEST CONTROL PRODUCTS ACT

EEP OUT OF REACH OF CHILDREN

NOTICE TO BUYER: Seller's guarantee shall be limited to the terms set out on the label and subject thereto, the buyer assumes the risk to persons and property arising from the use or handling of this product, and accepts the product on that condition.

Patent 2,149,164 Made in Canada 121-CAN

NET CONTENTS 5.0 kg contents may settle

SAFETY AND MODE OF ACTION

Diatomaceous earth (DE) is formed with mineral skeletons of countless single-celled plankton called diatoms. DE is extremely stable and does not produce toxic chemical residues or react with other substances in the environment. The active substance is amorphous silicon dioxide which is registered as a food additive. DE is used in many commercial products. **Protect-It®** absorbs the cuticular lipid layer on the insect. With this protective layer corrupted, the insect is unable to retain moisture, and as a result the insect dies from dehydration. Optimum conditions are low grain moisture content and lower relative air humidities.

PRECAUTIONS: EEP OUT OF REACH OF CHILDREN

Avoid contact with eyes. Use adequate ventilation and avoid breathing dust. Causes irritation and soreness in throat and nose in cases of extreme exposure. Some congestion may occur. Not hazardous when ingested. Wear a suitable dust mask approved by NIOSH/MSHA when handling. For applications to stored grain or when using a dust blower, wear a full-face NIOSH-approved respirator during mixing, loading and application.

For use in Food and/or Feed Processing Facilities:

Apply only when plant is not in operation. Cover or remove all food processing equipment, packaging material and utensils before application. Wash all surfaces that may contact food and rinse with potable water before re-use.

FIRST AID: If eye irritation occurs, hold eye open and rinse slowly and gently with water for 15-20 minutes. Removed contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treament advice. If inhaled, move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treament advice. Take container, label or product name and Pest Control Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION: Treat symptomatically.

DISPOSAL: Thoroughly empty the contents of the container into the application device. Do not reuse container. Follow provincial instructions for any required additional cleaning of the container prior to its disposal. Make empty container unsuitable for use. Dispose of the container in accordance with provincial requirements. For information on the disposal of unused, unwanted product and the cleanup of spills, contact the manufacture or the provincial regulatory Agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

STORAGE: Store in a cool and dry area.

This product has been found to affect test weight and flowability of wheat and barley when treating stored grain (see table below). It is the responsibility of the owner of the grain to insure that the application of **Protect-It®** will not degrade the grain on account of test weight loss.

Average Test Weight Losses (kg/hl) for Three Commodities
Application rates of 0.1, 0.15 & 0.5 kg/tonne of grain (100, 150 & 500 ppm)

Commodity	Application Method	Test Weight Reduction (kg/hl) 100 ppm	150 ppm	500 ppm
Hard Red Spring Wheat (3% dockage)	dry	3.4		5.3
Durum Wheat (commercially cleaned)	dry	3.0		5.2
Barley (1.5% dockage)	dry		8.6	

According to grain regulations visual detection of **Protect-It®** on grain will cause the grain to be down-graded to due to adhered foreign material. Under normal circumstances, **Protect-It®** is not visible on grain at concentrations up to 400 ppm.

The Canadian Grain Commission recommends that wheat contain no more than 100 ppm **Protect-It®**. Wheat containing more than 100 ppm diatomaceous earth can be diluted by mixing with untreated wheat. Because the dehydration process progresses slowly, treated wheat should not be mixed with untreated wheat for 4 weeks after treatment with **Protect-It®**.