DEGESCH America, Inc. Newsletter

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Issue XVIII

Changes to the Phostoxin Label

D&D HOLDINGS, INC.
(Degesch America, Inc. & Pestcon Systems, Inc.)
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Important Announcement Regarding Phostoxin® and Fumitoxin®
Tablets & Pellets

April 6, 2010

Re: Fumitoxin® Tablets & Pellets: EPA Reg. Nos. 72959-1 & 72959-2
Phostoxin® Tablets & Pellets: EPA Reg. Nos. 72959-4 & 72959-5

D&D Holdings, Inc., the parent company of Degesch America, Inc. and Pestcon Systems, Inc., has a long record of proactive stewardship of its products. It appears that the tragic death of two children in Utah in February may be related to the misapplication of the above referenced products. To ensure that an incident like this never occurs again, D&D Holdings announced today that it has entered into a voluntary agreement with the United States Environmental Protection Agency to amend the container labels and applicator manuals for these products and encourages applicators to use the products in accordance with the new label directions immediately. Highlights of the label changes are:

- The use of this product is strictly prohibited on single and multi-family residential properties and nursing homes, schools (except athletic fields), daycare facilities and hospitals.

- This product must be used out-of-doors only for control of burrowing pests and for use only on agricultural areas, orchards, non-crop areas (such as pasture and rangeland), golf courses, athletic fields, airports, cemeteries, rights-of-way, earthen dams, parks and recreational areas and other non-residential institutional or industrial sites. THIS PRODUCT MUST NOT BE APPLIED INTO A BURROW SYSTEM THAT IS WITHIN 100 FEET OF A BUILDING THAT IS, OR MAY BE, OCCUPIED BY HUMANS, AND/OR DOMESTIC ANIMALS.

a. When this product is used in athletic fields or parks, the applicator shall post a sign at entrances to the treated site containing the signal word DANGER/PELIGRO skull and crossbones, the words: DO NOT ENTER/ NO ENTRE, FIELD NOT FOR USE, the name and EPA registration number of the fumigant, and a 24-hour emergency response number. Signs may be removed 2 days after the final treatment.
b. When this product is used out-of-doors to a site other than an athletic field or park, the applicator

shall post a sign at the application site containing the signal word DANGER/PELIGRO skull and crossbones, the name and EPA registration number of the fumigant, and a 24-hour emergency response number. Signs may be removed 2 days after the final treatment.

- A Fumigation Management Plan (FMP) must be written for all fumigations prior to actual treatment.
- Persons that use this product to treat rodent burrows must be a certified applicator or working under the direct supervision of a certified applicator and be trained specifically for use of this product in burrowing pest control. A copy of a FMP must be provided to the customer.

Additional information can be found here:

http://www.epa.gov/oppsrrd1/reregistration/alphosphide/aluminum-magnsm-phos-fs.html

Insect Resistant Packaging Studies

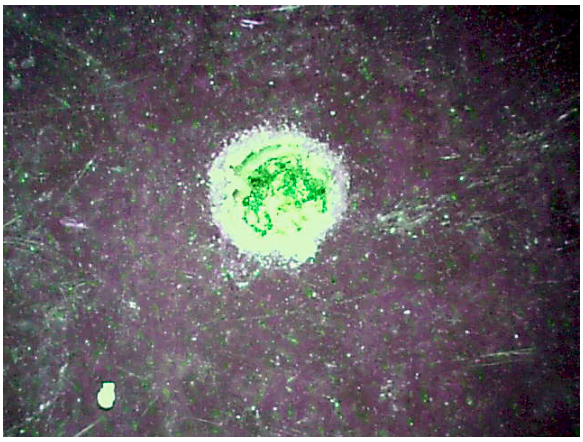
Editors Note: In our last issue we featured the Mi-Scope Portable Digital Microscope. Mike Holcomb, President of Technical Directions, Inc sent along this article which highlights how he uses the Mi-Scope.

Insects that feed on cereal grain-based food products are often reported as contaminants by consumers. Pet food, cake mixes, peanuts, dried fruits and raisins, spices, rolled oats, candy and similar commodities are highly susceptible to insect attack, and are frequently identified by consumers. Food manufacturers and retailers commonly find themselves in a defensive position against such claims which often end in finger pointing between the manufacturer, the retailer, and the distribution warehouse. Responsibility can only be determined and corrective actions developed after an exhaustive investigation that includes pest identification, a review of the pest activity records (including pheromone trap data), comparisons of manufacturing and shipping dates, the post-processing chain of custody (especially warehousing and shipping practices), and a detailed sanitation/pest management inspection of all facilities involved. An important insect preventative step that high-risk-commodity processors often overlook is the need for insect-resistant packaging; stored product insects are tenacious and adept at either chewing their way through a package wall (package invaders) or entering small package openings (package invaders). Common examples are the Indian meal moth larva which can chew its way through 3-mil plastic and aluminum foil, and the red or confused flour beetle which can crawl through an opening as small as 1mm. In addition to the review of the product history from processing to consumption, and a proper identification of the guilty insect, it is necessary to examine the food packaging to determine just how the insect entered the package before any corrective action can be taken. Such package investigation falls into 2 phases:

1. Gross morphology. Techniques used depend on the nature of the package (multi walled craft paper, heat-sealed pouch, glued box, etc.), and usually involves nothing more than a flashlight and a hand lens.
2. Destructive Analysis. These investigations involve dismantling package samples and reviewing them with laboratory tools such as microscopes to determine whether the insect chewed its way into the bag or out through it, or any structural faults in the package wall (folds, seams, stitch holes, physical damage, etc.) large enough to allow insect entry.

As a professional entomologist I use several types of microscopes and cameras to review and document my work in this area. Some of those tools cost several thousand dollars each, and are much too large and sensitive to be carried all over the world! I recently reviewed the Mi Scope to take close up photos of stored product insects and their damage. The low cost, portability, and ease of use (digital pictures are stored directly to my computer hard drive) make this a tool that I now carry with me on food plant investigations. It certainly does not replace my laboratory investigation tools, but as I practice around with it I am amazed at the quality records it produces for me. At the same time it makes it easy for me to share findings with others both in classroom and report writing.

This is an unaltered picture that I took with the Mi Scope showing the head and thorax of a merchant grain beetle. Note the small, pointed post-ocular projections (small knobs that stick out behind the eyes) on either side of the head. These minute projections are used to differentiate this beetle from its close relative the saw-toothed grain beetle. Ordinarily, these are very difficult to see, even with a dissecting microscope! Likewise the 3 light-colored ridges (carinae) running the length of this beetle's thorax (from base of head to the wings) and the teeth-like projections on both sides of the thorax make it very easy to distinguish this pest from the flour beetles. Such pictures can be used to document your identification, as well as in training programs.



This photograph shows an Indian meal moth penetration hole through a foil snack food wrapper. While a little fuzzier than what I would like, and the colors are just a little distorted, this photo clearly shows what I need to know. Then again, this picture was taken with the Mi Scope rather than my $4500 micro-camera! Regardless of which camera snapped the picture, I can still see the features I need to document what happened in this particular consumer complaint. What looks like a green hole in the middle of this red package is actually a reflection of the silver lining used on the foil. Do not pay attention to the green spot; look instead to the bright halo surrounding the hole itself. Note the small foil fibers standing up; these are minute pieces of foil that were left standing up when the larva grabbed a mouthful of packaging and pulled up (outward) on it! These small out-pointing fibers prove that the larva was on the outside of the package, started to pull on the foil with its mandibles, and eventually chewed its way in. This is a case of package penetration after the product was bagged!

Phosphine Shows Potential as a Methyl Bromide Replacement for Controlling Pests of Dried Hams

Editors Note: Tom Phillips* from Kansas State University is conducting research into the use of phosphine to control pests of dried hams. The following is a summary of his work to date.

Southern dry cured hams are made by a centuries-old process of preserving hams with salt during colder temperatures and aging at warmer temperatures for months to years. During the aging process the hams are susceptible to infestation by arthropod pests, most notably the red-legged ham beetle, Necrobia rufipes, and the ham mite, Tyrophagus putrescentiae (see photos below). The ham beetle is naturally adapted to consuming dried meat from the bones of animal cadavers, and can be a pest in bone-cleaning operations of museums and against artifacts made of animal products. The ham mite is well known as the "cheese mite" due it being a serious pest of aging cheeses and it also has the common name "mold mite" as it consumes fungi and is part of the house dust mite complex in human habitations. Methyl bromide has been the fumigant of choice for the dry cured (country-cured) ham industry due to its high efficacy and relatively short treatment times. The phase-out and eventual ban of methyl bromide as an ozone-depleting substance under the U.S. Clean Air Act and the international Montreal Protocol has necessitated research on effective alternatives for controlling these pests.

Left, adult of the red-legged ham beetle, approximately 6 mm long.

Right, eggs, nymphs and adults (less than 1 mm long) of the ham mite, shown infesting a piece of pet food.

Meat Scientists at Mississippi State University, lead by Wes Schilling and Benjy Mikel, and entomologists at Kansas State University working with Tom Phillips have been researching fumigant alternatives for the pests of dried hams for the past two years with funding from the Methyl Bromide Transition program of the USDA. The goal of the work was to develop an alternative that could be used in two days, the typical treatment time that is currently used with methyl bromide, and at a temperature of 23°C (74°F) which would give a good challenge to a fumigant and assuming better effectiveness at a higher temperature. The gases sulfuryl fluoride, carbon dioxide and ozone along with low oxygen achieved under vacuum were either ineffective or impractical to achieve adequate control of both ham beetles and ham mites. Phosphine, or hydrogen phosphide gas, applied as precise doses to treatment jars gave excellent control of all life stages of the ham beetles and showed very good promise for controlling the ham mites (see photos below). Mites are inherently difficult to kill with fumigants, perhaps due to their undeveloped respiratory system. Dose-mortality studies of phosphine applied to mites found that a concentration of 608 ppm (parts per million) killed all eggs, nymphs and adults in a sample, and statistical analyses estimated that 1,245 ppm would be needed to achieve 95% kill of a large population. All ham beetle life stages (eggs, larvae pupae and adults) were killed at 335 ppm, and statistics estimated that only 114 ppm would be needed for 95% kill of a large population. All of these doses are within the legal label rates for phosphine applied to grains and other foods, and dried meats are currently on the Phostoxin label from Degesch America, Inc. as a food that can be legally treated. Meat science studies of phosphine-treated hams found no harmful residues following phosphine fumigation, no undesired off-flavor compounds, no sensory differences (as determined by consumer taste panels), and no negative effects on marketability or other quality factors. Thus phosphine gas may be an effective and safe alternative to methyl bromide for treating southern dry cured hams. Future work will evaluate the effectiveness and applicability of commercial scale phosphine fumigations of hams and their storage structures

Left, laboratory dose-response bioassays assess mortality of known numbers and life stages of beetles and mites to different concentrations for phosphine gas for 48 hrs at 23 degrees C.

Right, larger scale laboratory studies to confirm control of large numbers of pests infesting hams, and to investigate any effects of phosphine on ham quality and marketability.

* Tom Phillips is Professor and Head of the Entomology Department at Kansas State University, Manhattan, KS and can be contacted at twp1@ksu.edu.