

Pest Management News

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Pesticides Sales and Purchases over the Internet

John D. Hopkins

I have had several questions recently concerning the online purchasing of insecticides via the internet and what follows is taken from an EPA Fact Sheet on Pesticides Sales in E-Commerce. Internet-based pesticide marketing is a convenient and ever evolving medium for pesticide sales and distribution. All types of pesticides are sold through the internet, including conventional use and antimicrobial pesticides. U.S. EPA is working closely with the states through the Association of American Pesticide Control Officials (AAPCO) to develop an informed and nationally consistent approach to pesticide electronic commerce activities, including agricultural use pesticides.

So everyone will be on the same page, a pesticide can be defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest or intended for use as a plant regulator, defoliant, or desiccant. The substances listed below are all examples of pesticides.

- Cockroach sprays and baits
- Flea and tick sprays, powders, collars and wrist bands
- Hospital disinfectants
- Industrial Chemicals
- Insect control chalk (a/k/a Chinese chalk)
- Insect repellants
- Kitchen, laundry, and bath disinfectants and sanitizers
- Lawn and garden products that kill weeds, insects, or plant diseases
- Plant protection chemicals that kill weeds, insects, or plant diseases
- Products that kill or control mold or mildew
- Rat, mouse, and other rodent poisons
- Some swimming pool chemicals

Pesticides are poisons designed to control specific organisms. Handling of pesticides according to U.S. EPA and state registration and labeling requirements ensures that exposure to these products is minimized. However, a misused or mishandled pesticide may be harmful to humans, other organisms, and the environment. The anonymity and remoteness of the parties involved in internet

sales increases the inherent risk involved with the handling or use of pesticides when they are purchased over the internet and shipped.

Many different types of pesticides are offered for sale over the internet. Both federal and state pesticide laws and regulations apply to these sales. Relevant federal requirements are listed below.

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) 7 U.S.C. §§135 *et seq.*
- Federal Food, Drug, and Cosmetic Act (FFDCA) 21 U.S.C. §§301 *et seq.*
- 40 Code of Federal Regulations Parts 150 to 189
- 49 Code of Federal Regulations Parts 100 to 185
- 19 Code of Federal Regulations §§12.110 to 12.117

No person in any state may distribute, sell, or offer for sale or distribution to any person any pesticide that is not registered in accordance with §3 of FIFRA. Generally, it is the **seller's responsibility** to ensure that pesticides sold over the internet are labeled according to federal standards and are registered both by the U.S. EPA and any state in which they are distributed before offering them for sale.

If you are selling a pesticide over the internet, be aware that there are federal and state laws affecting the shipment, proper transportation, and delivery of the pesticide. Federal laws administered by the U.S. EPA, the U.S. Department of Transportation, U.S. Postal Service, and the U.S. Department of Homeland Security regulate the shipping and transportation of pesticides. Each state has its own laws regulating the sale, distribution, and use of pesticides within that state. You should check on the state laws regulating the use and sale of pesticides in each state where you sell pesticides. Some states regulate restricted use pesticides (see below) more strictly than the federal government.

Dealers must meet federal requirements and be certified according to state law in each state where they sell pesticides. In Arkansas, applicators of anything other than general use pesticides must meet federal requirements and also be licensed to apply pesticides. Certification and licensing functions are typically administered by states and defined by state law. Some higher risk pesticides are classified as restricted use pesticides (RUPs), and are more stringently regulated by the states and the U.S. EPA than general use pesticides. RUPs may be sold only by licensed dealers and purchased only by certified applicators. When pesticide labels state "For use by individuals/firms licensed or registered by the state to apply general pest control products or termiticide products", "For Pest Management Professionals and Commercial Use Only", or similar such wording, sellers may require the buyer to be a properly licensed applicator.

When you purchase pesticides over the internet, the label is the law. The pesticide you purchase must be used in accordance with the instructions on the label. It is a violation of federal law to use a pesticide in a manner inconsistent with its labeling.

If you purchase a restricted use pesticide (RUP), federal law requires that you must be a certified applicator in the state where the pesticide will be used. Applicator certification, although required by both state and federal law, is administered by the individual states. In Arkansas, certification information can be obtained from the Arkansas Agriculture Dept., Arkansas State Plant Board, <https://www.agriculture.arkansas.gov/licensing-permits1>, (501) 225-1598 or your local Cooperative Extension Office.

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Proper handling of pesticides may include, but is not limited to, the listing, sale, purchase, shipping, transport, delivery, receiving, preparation, and use of the product. Some of these actions are covered by FIFRA and state laws relating to the use of pesticides.

Shipping, transport, delivery and acceptance of pesticides are covered by laws and regulations administered by the states, the U.S. Postal Service, and the U.S. Department of Transportation.

If you are handling a pesticide in any of these contexts, you should contact the carrier you want to use for shipping and the pesticide officials in your state before transporting the product.

There are several types of websites that are typically involved in the sale, distribution, and use of pesticides, including:

Registrant or producer sites

Many registrants and producers of pesticides have established web sites that will work to support internet marketing plans.

Retail or distributor sites

These sites include both commercial pesticide retailers that specialize in pesticide sales and general retailers that sell a variety of products, including pesticides. Retailers in both groups have web sites that offer their products for sale over the internet.

Commercial user and applicator sites

Pest control and janitorial companies have web sites established to market their goods over the internet. Industrial chemicals are also marketed over the internet for sale in larger quantities.

Auction sites

Auction sites, like eBay, include both general auction sites and agricultural chemical auction sites. These web sites often act like brokers and bring buyers and sellers together to sell pesticides. eBay has developed, in cooperation with U.S. EPA, and implemented a policy that allows for the sale of general use pesticides and clean, empty containers as collectibles. This policy prohibits the sale of restricted use pesticides, unregistered, cancelled, or suspended pesticides.

Foreign sites

Foreign-based web sites advertise and market pesticides worldwide, including in the United States. Pesticides marketed on foreign web sites may or may not be registered for use in the United States. Even if a particular pesticide offered for sale is registered, it may not be in compliance with FIFRA or relevant state laws and regulations.

Other

Some web sites are informational and may provide copies of labels, material safety data sheets, or other information on pesticides. Sometimes these web sites will provide instructions on how to make pesticides.

With respect to enforcement against e-commerce violators, the U.S. EPA works cooperatively with the Federal Trade Commission (FTC) on regulating web sites that sell pesticides. Future areas of focus include web sites that sell restricted use pesticides to persons who are neither trained nor certified in the application of these toxic chemicals as required by FIFRA.

The following subjects provide information on compliance with pesticide laws and regulations and can be accessed through the U.S. EPA web site at: <http://www.epa.gov> or by clicking the link below:

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- [Pesticide Compliance Assistance](#)
- [FIFRA Enforcement](#)
- [Office of Pesticide Programs](#)
- [Agriculture Compliance Assistance Center](#)
- [Pesticide Labels](#)

The following web sites provide additional information about the proper handling, transportation and shipping of pesticides.

- [U.S. Customs and Border Protection: Internet Purchases; Your Responsibility and Liability](#)
- [U.S. Department of Transportation - Office of Hazardous Material Safety](#)
- [U.S. Postal Service, Publication 52, Hazardous, Restricted, or Perishable Mail](#)

Horse and Deer Flies

Kelly M. Loftin

Horse flies are likely the most bothersome biting fly associated with equine activities in horse-fly prone areas. Aside from the painful bite they inflict on us or our livestock, they can transmit pathogens that cause livestock disease. Important livestock diseases that can be transmitted by horse flies include anaplasmosis in cattle and equine infectious anemia in horses.

Equine Infectious Anemia (EIA), sometimes referred to as swamp fever, is common in the southeastern US and is mechanically (on the fly's mouthparts) transmitted from infected to non-infected horses via their bloody mouthparts. EIA is a viral disease that causes lethargy, weight loss, and sometimes death in an infected animal. Additional information about Equine Infectious Anemia in Arkansas is available at: <https://www.uaex.edu/publications/PDF/FSA-3032.pdf>.

Anaplasmosis (a Rickettsial infection - *Anaplasma marginale*), is found frequently in the southeastern US. In adult cattle, this disease can result in anemia, fever, weight loss and possible death. Infected ticks are potential biological vectors of this pathogen, however horse flies can mechanically transmit the pathogen from infected to non-infected cattle. Additional information about Anaplasmosis in Arkansas is available at: <https://www.uaex.edu/publications/pdf/FSA-3081.pdf>.

Horse and deer flies are both members of the Family Tabanidae and can be distinguished from one another by size and wing coloration. Horse flies (Figure 1) are larger (from $\frac{3}{4}$ to greater than an inch long) than deer flies (slightly larger than house flies), heavy bodied and large headed. Deer flies (Figure 2) have markings on their wings while horse fly wings are clear or of a uniform color. Both are painful biters and readily feed on livestock, wildlife and humans; however, horse flies are commonly associated with feeding on livestock while deer flies frequently attack humans.

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Figure 1. Horse fly. (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).



Figure 2. Deer fly (*Chrysops reicherti*). (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).

Most horse fly eggs (Figures 3) are laid in layered masses on vegetation overhanging aquatic habitats or moist soil such as marshes or pond margins. Eggs hatch and larvae develop in aquatic and semi-aquatic habitats. Developing larvae feed on annelids, molluscs or insect larvae. Some are even cannibalistic. Depending on the species, the larval period lasts from one month to over a year (Figure 4). Fully mature larvae migrate to a drier area of their larval habitat and pupate. Adults emerge from the pupal stage from 1 to 4 weeks following pupation.



Figure 3. Horse fly eggs on vegetation. (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).



Figure 4. Horse fly (*Tabanus atratus*) larva. (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).

Horse and deer flies are attracted to the carbon dioxide that we and other animals exhale. They also hone in on movement, shiny surfaces and warmth. Once they find a suitable host, they use their knife-like mouthparts to slice the skin and feed on the pool of blood that forms. One USDA publication estimated that 20-30 horse flies feeding for six hours would take about 20 teaspoons (~ 100 ml.) of blood. Horse flies feed during the day and prefer sunny areas, seldom entering barns or heavily shaded areas.

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Horse flies can be serious pests of cattle and horses through irritation, blood loss and potential disease transmission. The most important species include the black horse fly (*Tabanus atratus* Fabricius), the black striped horse fly (*Hybomitra lasiophthalma* Macquart), the lined horse fly (*Tabanus lineola* Fabricius) and the autumn horse fly (*Tabanus sulcifrons* Macquart) (Figures 5-8). Horse flies are mechanical vectors of hog cholera, equine infectious anemia, anaplasmosis and tularemia; and biological vectors of *Elaeophora schneideri*, a filarial nematode causing disease in wild ruminants primarily in the Rocky Mountain States.



Figure 5. Black horse fly (*Tabanus atratus*). (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).



Figure 6. Black striped horse fly (*Hybomitra lasiophthalma*). (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).



Figure 7. Lined horse fly (*Tabanus lineola*). (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).



Figure 8. Autumn horse fly (*Tabanus sulcifrons*). (Photo credit: Sturgis McKeever, Georgia Southern University, Bugwood.org).

Horse flies are effective mechanical disease vectors because they take large blood meals and, as a result of their painful feeding, are often interrupted during feeding. They inject an anticoagulant to prevent blood clotting, sponge up the blood and feed until they are replete with blood (usually taking 3 to 5 minutes). If a fly is interrupted during blood feeding, it will either find another spot on that animal or find another animal to feed upon. Anaplasmosis in cattle and equine infectious anemia in horses may be transmitted from an infected or carrier animal to a susceptible animal by bloody mouthparts.

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Personal protection:

Wear light colored clothes when working or recreating in horse or deer fly infested areas. If you are caught off-guard without the proper clothing or repellent, remember that horse and deer flies are less likely to enter shelters and heavily shaded areas.

We can protect ourselves from deer and horse fly bites with the repellents routinely used to protect against mosquitoes. Formulations containing DEET, IR 3535, Picaridin or Oil of Lemon Eucalyptus can provide a few hours of protection. Clothing only repellents containing permethrin (Permanone and others) can also provide protection. Never apply permethrin directly to exposed skin and always allow clothing to dry completely before wearing. Closely follow all label directions and precautions for both skin repellents and Permanone.

Protecting livestock:

Horse flies are difficult to control for a number of factors. First, the large size of the horse fly increases the dose required to produce mortality. Secondly, the brief time period a fly would be exposed to the insecticide while feeding on a treated animal adds to control difficulty. Also, the horse fly has the ability to fly a considerable distance from the emergence site to the host and occupies a wide range of larval habitats that limit larval control. Horses and other livestock can be temporarily protected with pyrethroid insecticides (such as permethrin). Pyrethroid insecticides are irritating to horse flies and will cause them to leave before they have a chance to bite. Often the flies are only repelled from the treated areas and will bite untreated areas of the animals, so thorough coverage is important. Frequent reapplication is often necessary. Forced-use self-treatment sprayers have been used with some success to manage horse flies on cattle. Some permethrin formulations also contain a synergist (piperonyl butoxide) and an oil based carrier which provide longer lasting effects. Always read the label and follow all directions and precautions when using these insecticides.

A good option to protect livestock is to provide shelter (horse flies seldom enter structures) for the animals or pasturing them away from infested areas. Some traps have shown promise in providing limited control.

Fall Armyworm Update

Kelly M. Loftin

As of June 28, 2019, reports of fall armyworm infestations in Arkansas bermudagrass have been scant. Worms have been identified on signalgrass in a field in Sevier County and in bermudagrass fields in Bowie Co. Texas. In addition, extension specialists in Mississippi are reporting fall armyworms above treatment level in their state. By this date in 2018, we had already experienced severe infestations in south and southwest Arkansas. Although we haven't experienced any major fall armyworm infestations so far, the threat exists. Now through fall, we should continue scouting pastures and hayfields. Diligence is critical in identifying and managing outbreaks before significant losses occur. Infestations are easily overlooked when the caterpillars are small and eating very little. Once they grow large and consume more grass, damage becomes apparent.

Clues to fall armyworm infestations include: 1) field appears "frosted" 2) presence of birds in the field or 3) the odor of freshly grass. Armyworm outbreaks usually often occur in waves about 30 days

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apart. However, when mixed worm sizes occur, overlapping generations are present and new infestations occur more frequently than 30 days. When scouting, carefully examine grass blades, stems and organic debris at plant base for armyworms. It is best to take at least ten one-foot-square random samples across the pasture or hay meadow. Make note of the armyworm sizes as this will help make good management decisions.



Fall Armyworms (*Spodoptera frugiperda*).

Insecticide application is recommended when an average of two or three fall armyworms per square foot occur within the field. Per-acre insecticide cost will vary from as low as about \$1.50 up to about \$14.00. When calculating cost, always consider the cost per acre and not the cost per gallon of product. Consider residual activity of the product, especially if you are seeing multigenerational

populations (all sizes of fall armyworm caterpillars) and heavy armyworm pressure. Pyrethroid insecticides such as Karate® (lambda-cyhalothrin), Mustang Max® (zeta-cypermethrin) and Baythroid XL (beta-cyfluthrin) have short-duration residual activity. In contrast, products such as Prevathon® (chlorantraniliprole), Besiege® (chlorantraniliprole and lambda-cyhalothrin) and Intrepid® (methoxyfenozide) have longer-duration residual activity and can reduce the number of applications necessary to produce a hay crop. Efficacy evaluations in 2017 and 2018 demonstrated that a mixture of lambda-cyhalothrin and Dimilin® (diflubenzuron) would provide longer-duration residual activity at less than one-half the cost of the more expensive products. The rate we evaluated was 3.8 oz. lambda-cyhalothrin and 2.0 oz. Dimilin® per acre. Also remember, if the grass is ready, cutting for hay will avoid the need to make an insecticide application. For additional information on armyworms see “Managing Armyworms in Pastures and Hayfields” and is available at:

<http://www.uaex.edu/publications/PDF/FSA-7083.pdf> and the “2019 Insecticide Recommendations for Arkansas” at: <https://www.uaex.edu/publications/Field%20Crops.pdf>.

Bed bugs in Poultry Breeder Flocks

Kelly M. Loftin

Although bed bugs, *Cimex lectularius* L., are most commonly considered as pests of homes, hotels, college dorms and public schools, they can be a formidable problem for poultry breeder flocks. Bed bugs readily feed on chickens and have ample hiding areas, allowing some poultry facilities to become heavily infested. In addition to negative impact on production, poultry workers could carry bed bugs from the poultry operation to their homes. Bed bugs can become established in structures by hitching rides in baggage, bedding, furniture, boxes, laundry and clothing. Fortunately, bed bugs are not known to transmit diseases. They feed on blood, primarily at night, and can cause small, dark, swollen welts on poultry. Bed bug infestations are sometimes recognized by blood stains and dark

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excreta spots. During the daylight, bed bugs hide out in cracks and crevices, which in poultry facilities, can be numerous. Common hiding (harborage) sites include cracks, crevices, curtain folds, nest boxes, utility rooms and slats. In severe infestation they may hide in ceiling areas. Bed bugs will travel from a few feet up to about 20 feet from their hiding place to feed.

The adult bed bug is reddish-brown, oval-shaped, flattened and about 3/16 of an inch long (Fig. 1). Nymphs (immatures) look similar to, but smaller than adults. There are five nymphal molts, and each nymph must have a blood meal to be able to molt to the next stage. On average, adults feed about once a week and during their four-month or longer lifespan, they will feed many times. Three or more generations per year can occur. They also exhibit a unique form of copulation called “traumatic insemination” (also known as hypodermic insemination). In traumatic insemination, the male’s hypodermic needle-like genitalia pierces the female’s abdomen and release sperm into the body cavity. The sperm travels through the hemolymph, reach the ovaries, and fertilize the eggs. A female bed bug will lay approximately 350 eggs during her life-time.



Bed bugs, *Cimex lectularius*. Photo by Allen Szalanski, Bugwood.org.

Bed bugs are more difficult to control in poultry facilities than in commercial and residential housing for a number of reasons. First, an abundance of bed bug harborage sites such slats, curtains, nest boxes, cracks and crevices occur in poultry facilities. Secondly, many of these harborage sites are in areas that are not easily accessible to apply an insecticide. Also, dust can accumulate over an insecticide application quickly. And finally, an abundant blood source (chickens) exists in poultry facilities.

Bed bugs are very difficult to control, especially in facilities where birds are present. Insecticide applications are aimed at harborage sites NOT the birds. Labeling restrictions limit the number of products that can be applied when birds are present. Products that can be used with birds on the farm include permethrin formulations, Ravap EC (tetrachlorvinphos and dichlorvos), and Rabon 50 W (tetrachlorvinphos). The 2019 MP 144, “Insecticide Recommendations for Arkansas” list products labeled to control bed bugs.

Bed bug control in poultry facilities is best achieved after the birds have been removed and the facility has been thoroughly cleaned and disinfected. Following disinfection, apply insecticides with residual activity to cracks, crevices, nest boxes, slats, curtains or curtain folds, utility rooms, possibly ceiling seams and other apparent harborage areas. Examples of insecticides with residual activity labeled for

use when birds are not present include: ActiShield™ (bifenthrin), Grenade® ER (lambda-cyhalothrin), OxyFly® (lambda-cyhalothrin), Tempo® 20 WP (cyfluthrin) and Tempo® SC Ultra (beta-cyfluthrin).

Heat treatment can be an effective method to control bed bugs in breeder flock facilities. This method of control is used when chickens are absent from the facility. The treatment protocol requires sustained heating of the houses to 130 °F for a few hours to kill bed bugs and their eggs. Some pest control companies have the heat equipment and expertise necessary for effective heat treatment. When heat treatments are used, it's a good idea to apply a residual insecticide treatment outside the building to kill escaping bed bugs.

To prevent carrying the bed bug infestation to your home be sure to change clothes and wash your clothing in hot water and dry it on high heat after being inside an infested chicken house. Alternatively, you may place clothing directly in the dryer on high heat. Before bringing anything into the home from an infested poultry facility, thoroughly inspect all items for evidence of bed bugs.

Identifying Wildlife from Scat

Becky McPeake

Of all evidence used to identify wildlife, perhaps the most interesting, and sometimes hazardous, are scat samples. Scat is the scientific term wildlife biologists use for animal droppings or feces. Although some of my colleagues received their Master's degree analyzing scat and its contents, to my knowledge there is no formal science or class instruction offered on its identification. Several books and resources have been published to assist with identification. One web-accessible source is "Tools to Identify Animal Droppings" through the Internet Center for Wildlife Damage Management <http://icwdm.org/Inspection/Scat.aspx>. They offer three approaches to scat identification: (1) answer questions, (2) look at pictures, and (3) use a key (**see Identification Key to Scat Figure**).

When identifying scat, it is always important to "look" more than "touch." Scat can contain harmful parasites and diseases such as salmonella. Using disposable gloves and tools is recommended, and sometimes a particulate mask is advisable. Some diseases may be contracted through inhaling fine particles. An example is histoplasmosis, which is contracted from breathing airborne spores released from a fungus which grows on undisturbed piles of longstanding bat guano or bird droppings.

Important characteristics which facilitate identification from scat are its length, width, and shape (pellet, tubular, smooth or segmented, pointed or flat ends). If droppings contains white elements, it is likely a bird or reptile. Visible hair or food particles imbedded in the scat can be a clue, such as pieces of corn or insect parts. Often, animal diets vary with the seasons, and other inconsistencies can impede identification.

Environmental and other surrounding factors provide additional clues to identification. Are the droppings single or multiple? Is it in a pile or scattered? Does it appear as a one-time event, or in the same general spot for several days? What is above the scat? Could it have dropped from a tree or overhang? Is it near or in a residence or barn? Woods or lawn? Under a light, bird feeder, or other attractant?

Identifying scat is sometimes easy, but other times only a best-guess can be offered. The key "**Identification Key to Scat**" on the next page can help narrow the search for pictures or other collaborative evidence. If scat appears in the same location repeatedly, consider using a trail camera to observe the visitor. County agents can send samples or photos to me (Becky McPeake, rmcpeake@uaex.edu, 501-551-7337) for assistance. Please include a ruler in the photo to offer perspective.

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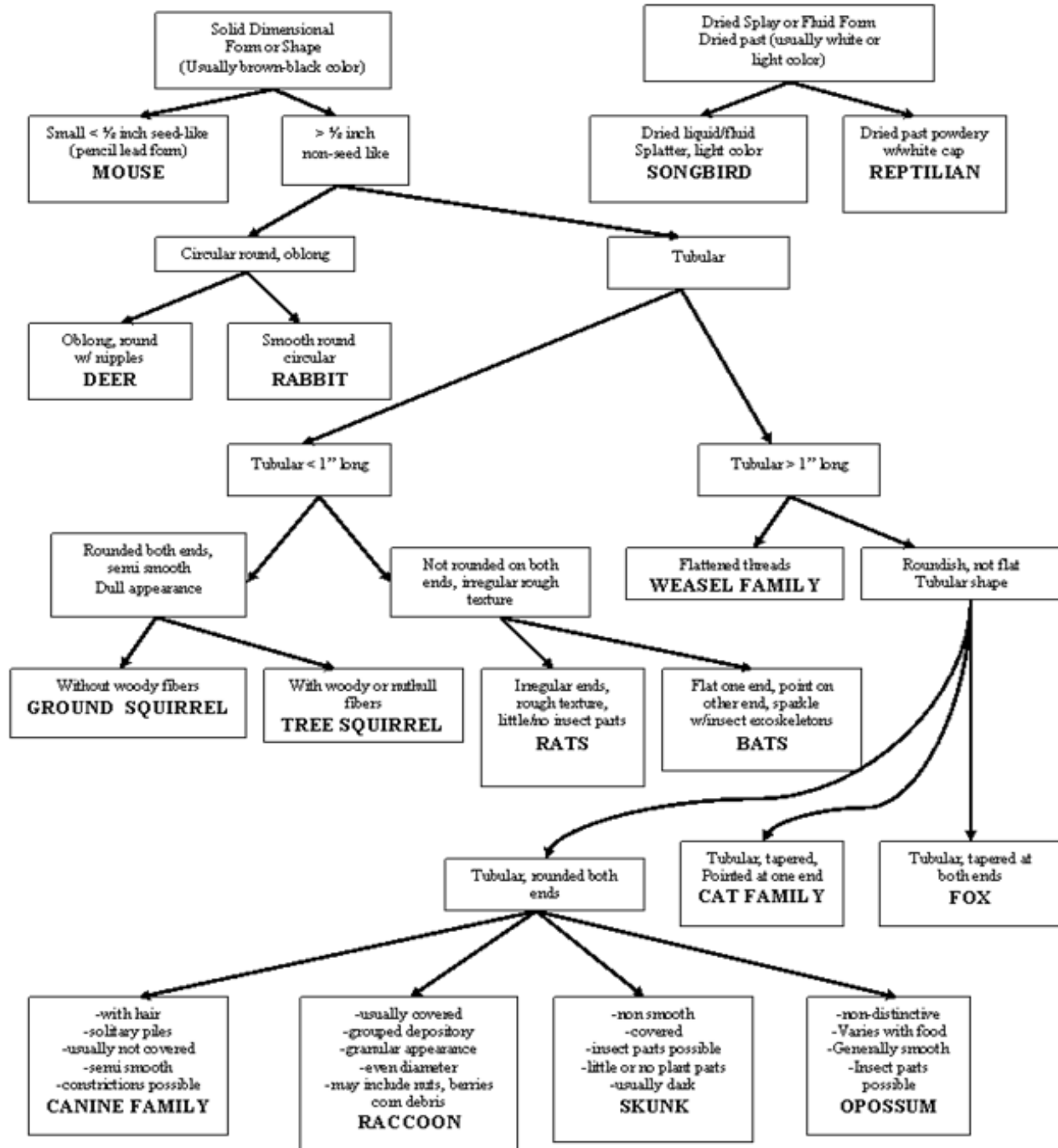
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Identification Key to Scat

A key to typically formed droppings of selected vertebrates
of Nebraska

Dennis Ferraro—UNL Cooperative Extension



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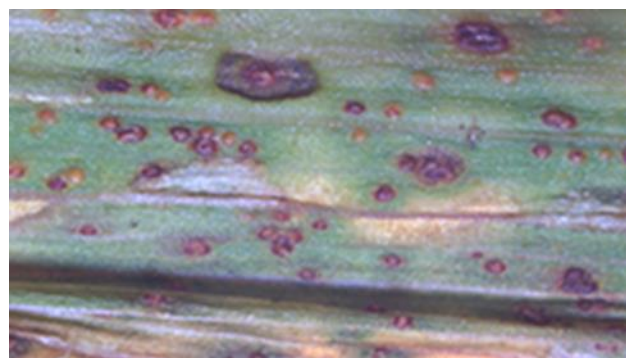
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Daylily Rust

Sherrie E. Smith

Daylily Rust caused by the fungus *Puccinia hemerocallidis* can be a serious disease of daylily. Daylily Rust is native to Asia, commonly found in China, Japan, Korea, Taiwan, and Russia. It was first identified in the United States in August of 2000 in the southeastern part of the country. The disease moved rapidly throughout the country and by the fall of 2001, it had been identified in over 30 states.



Daylily Rust Symptoms

Although it rarely kills the plant outright, it disfigures and weakens it. The spores of Daylily Rust are normally spread by wind, but here in the states infected nursery plants spread the disease. Newly purchased plants should be carefully checked for signs of rust. Symptoms on susceptible cultivars are raised pustules with a yellow to orange powder of spores. The leaves and scapes become yellowed, then necrotic. Infected leaves eventually shrivel up.

Resistant varieties may only get a few flecks instead of pustules. Prevention is the most desirable control. There are resistant cultivars available. All new daylilies should be carefully inspected prior to purchase for signs of rust. Management of existing infections consists of immediately bagging affected foliage to prevent spread of the spores, cutting it to the ground and destroying the clippings.

Homeowners may use Fertilome Broad Spectrum Lawn and Garden Fungicide, (chlorothalonil), or Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide, (chlorothalonil) or Ortho Maxx Garden Disease Control, (chlorothalonil), or Ortho Disease B Gon Garden Fungicide, (chlorothalonil), or Garden Tech Daconil Fungicide, (chlorothalonil), or Bonide Fung-onil Multipurpose Fungicide, (chlorothalonil), or Spectracide Immunox Plus, (myclobutanil & permethrin), or Bonide Rose Rx Systemic Drench, (tebuconazole), or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs, (tebuconazole), or Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer, (tebuconazole & imidacloprid), or Fertilome 2-N-1 Systemic Fungicide, (tebuconazole & imidacloprid), or Bonide Infuse Systemic for Turf and Ornamentals, (thiophanate-methyl), or Ortho Rose and Flower Insect and Disease Control, (triticonazole & acetamiprid).



Daylily Rust Symptoms

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Name That Herbicide

Tommy Butts

This month's weed science contest is Name that Herbicide! This herbicide class is used in numerous row cropping systems including corn, cotton, peanuts, rice, soybean, and wheat. Dependent on the specific herbicide, there are options for pre-emergence (PRE) and post-emergence (POST) applications. These herbicides tend to be considered more contact burners rather than systemic in activity, and are more often used to control broadleaves. Although labeled, they can still cause crop injury as seen on the rice in Picture 1, and the soybean in Pictures 2 and 3. Injury symptoms from POST applications of this herbicide class include: necrotic burning (Picture 1) and speckling (Picture 3). Injury symptoms from PRE applications of this herbicide class include: leaf crinkling (Picture 2) and reddish lesions on cotyledons.

Be the first to email Dr. Tommy Butts at tbutts@uaex.edu with the correct WSSA group number, mode-of-action, OR site-of-action and win a prize!



Picture 1



Picture 2



Picture 3

To The Readers

Please offer any suggestions for Urban or Livestock Integrated Pest Management topics (insect pests, plant diseases, weed problems, wildlife control problems) that you would like to see – **OR** – feel free to submit an article that you have prepared. Kelly and I will be glad to include it (subject to editing). Send feedback to jhopkins@uaex.edu or kloftin@uaex.edu

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