



Insect Identification Service



The number and diversity of insects makes contact with them inevitable. Some insects are harmful. They may damage homes, food, crops, gardens, trees, and lawns, or affect the health of people or animals. Such “pests” often need to be controlled. However, most insects are beneficial or innocuous, requiring no action at all. A few are endangered and require protection to survive. Before deciding whether to control, ignore or protect an insect, it must be accurately identified.

Where to go

Contact your local K-State Research and Extension office for help. Agents are knowledgeable and can identify many common insects. The Insect Diagnostic Laboratory (IDL) supports agents by offering an identification service they may use free of charge. The goal is to provide accurate and prompt identification of insects and insect-related problems. Information on biology, habits, possible damage, and control is available on request. The insect diagnostic lab also identifies non-insect arthropods, such as spiders, mites, ticks, centipedes, millipedes, etc.

Equipment

Each office should have glass, screw-top insect vials, mailing

canisters and submission forms (Figures 1, 2, 3 and 4). The insect diagnostic lab no longer returns vials and canisters after submission. If the local office runs out of supplies, they can request more and should allow two to three weeks for delivery.

Isopropyl (rubbing) alcohol is used to preserve insects. This material is inexpensive and can be purchased at most pharmacies, discount stores, and groceries. The diagnostic lab does not supply alcohol. Do not use formalin, formaldehyde, or other preservatives. Water is not a preservative. Insect vials and mailing canisters remain the property of the insect diagnostic lab and should not be used for other purposes.

Procedures

When trying to identify an insect or insect-related problem, capture several of the insects without damaging them. Insects smashed with a flyswatter or rolled newspaper can seldom be identified. Collect damaged plant or other material, if appropriate. Ask the local agent to identify the insect or problem. If identification is uncertain or to request confirmation, mail a physical sample or submit a digital image through the Distance Diagnosis System.

The K-State Research and Extension agent will ask you to complete a form, which can be found at: www.Entomology.ksu.edu/Extension. Click on Diagnostician in the menu on the left of the page and select the form from the list at the bottom. Without a completed form, the request may not be processed. It is important to be accurate and specific. The insect diagnostic lab needs as much information as possible to answer questions or solve the problem.

For specimens that must be examined physically in the laboratory, place the insect in a vial of rubbing alcohol to kill and preserve it. This is necessary with small or soft-bodied insects, such as aphids, gnats, and larvae. Shriveled, broken, or decomposing specimens cannot be identified.

Large insects such as beetles, moths, or butterflies, should be killed by placing them in a freezer for 24 hours. Keep them dry and ship in a crush-proof box cushioned with tissue paper. Do not use cotton because legs and antennae will tangle and break. Insects taped to index cards or mailed loose in envelopes arrive in pieces and cannot be identified. It is illegal to mail live insects.

Place a copy of the completed form in a mailing canister. The

best way is to fold the form in half once, roll it into a tube, and place it in the canister so it conforms to the inside. Place the vial in next with Styrofoam “peanuts” or other packing material to keep it from rattling or breaking. The K-State Research and Extension agent will mail the sample to the insect diagnostic lab.

When submitting plants or other material, place them in the mailing canister or use another container such as a cardboard box. Put plants or plant parts inside two Ziploc bags, seal, and place in a sturdy cardboard box. Seal with shipping tape. Mail early in the week to ensure plants will arrive by Friday in good condition. Always submit the most representative sample and describe the situation completely. Thoroughness allows the diagnostician to give you an accurate, complete, and quick response.

Digital images

For specimens to be used for digital imaging, either live or dead material may be used. In some instances live specimens are preferable because color, form, etc., are useful in identification. Many caterpillars that are preserved in alcohol lose their natural color. Because manuals often use color for identification, images of live specimens are desirable. Grub-like beetle larvae and fly larvae also discolor in preservative. Some specimens are particularly active. Slow them down by placing them in a freezer or refrigerator for a short time so as not to kill them.

Most digital cameras and scanners have limited ability to reproduce a clear image of small arthropods. In general, specimens that are 5 mm ($\frac{1}{4}$ inch) are too small to be useful for identification. Use judgment on specimens that are small but larger than 5 mm. The distance diagnosis system allows the K-State Research and



Figure 1. Screw-top vial

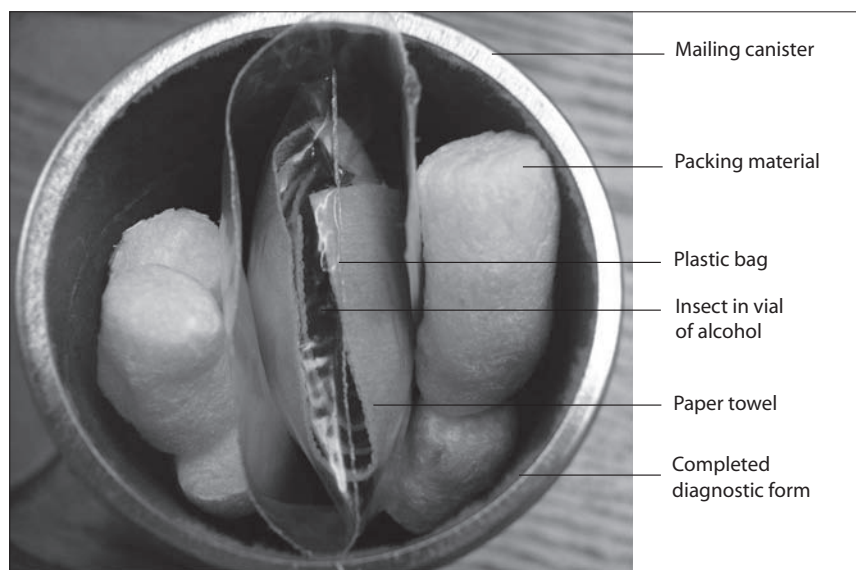


Figure 2. Components used for shipping insects. When shipping insects in alcohol make sure lid is on tight. Wrap vial in a paper towel and seal inside a plastic bag. Put bag in box or mailing tube filled with packing material. Enclose diagnostic form, seal package, and ship by surface mail.



Figure 3. Mailing canister

Extension agent to submit images and information relevant to proper identification and quick response. In general this includes location (county), date, client name, circumstances where arthropod was found (crop, building, etc.), agent, etc. At least three images can be loaded and submitted. For most arthropods an image of the top (dorsal) of the animal is crucial, and many insects can be identified with this image alone. But most will require other views.

For most caterpillars side and bottom (ventral) views are important as well as the head capsule. Beetles should be shown with top, bottom and head (front) views. If possible, butterflies and moths should have wings spread and top and bottom sides displayed. Spiders should have top and front (head) views submitted. If unsure how to photograph a specific insect, contact the insect diagnostician for help.

In addition to pictures of the insect, it is often useful to send images of the damage or habitat where insects were found. These images may be useful even when sending physical samples. In some cases it is best to send digital images of the insect and/or damage and follow-up by sending a sample. This allows the diagnostician to make a preliminary response based on digital images and confirm the diagnosis based on the physical sample.

At the lab

Once the sample or image arrives at the lab, the diagnostician reviews information provided, examines the specimen using references available in the laboratory, the Kansas State University Museum of Entomological and Prairie Arthropod Research (including arthropod specimens), the university library, and selected Web sites. Arthropods may be identified to order, family, genus or species level depending on the

problem. The specimen (and image if it is clear enough) may be sent to a specialist on that arthropod at another university, museum, etc. Responses will be transmitted through the online form, and hard copy can be provided.

One to three days are required to process samples, depending on time of year and complexity of the problem. Samples submitted through the Distance Diagnosis System are usually processed the same day. Sometimes the diagnostician will need to consult other sources that may delay the process. If there will be a delay, the diagnostician will inform the local agent.

Control recommendations

When control measures are requested along with identification, the insect diagnostic lab will refer to an appropriate K-State Research and Extension publication. Solutions to many common problems can be found here. If there is no publication that addresses the problem, the diagnostician may be able to suggest a non-chemical or cultural control method. If chemical control is needed, the request will be forwarded to a K-State entomologist. For liability reasons, the diagnostician is unable to provide chemical control recommendations not already listed in a K-State publication. Publications, newsletters and insect images are available on the Department of Entomology Web site at www.Entomology.ksu.edu/Extension.

Insect identification guides

Check bookstores and libraries for these and other helpful references.

- *Insects in Kansas*. 2000. White, S. and Salisbury, G. Kansas Department of Agriculture, Topeka. Available through Distribution Services, KSU, Umberger Hall, Manhattan, KS 66506.
- *Simon and Schuster's Guide to Insects*. R. H. Arnett, Jr. and R. L. Jacques, Jr. 1981. Simon and Schuster, New York.
- *The Audubon Society Field Guide to North American Insects and Spiders*. by L. Milne & M. Milne. 1980. Alfred A. Knopf, New York.

- *A Field Guide to the Insects of America North of Mexico*. by D. J. Borror & R. E. White. 1970. Peterson Field Guide Series. Houghton Mifflin, Boston.
- *Insects*. H. S. Zimm and C. Cottam. 2001. A Golden Guide from St. Martin's Press, New York.



K-STATE Research and Extension

Kansas State University

Horticultural Insect Diagnostic Form

Agent's Name <u>Ira C. Agent</u> County <u>Riley</u> Address <u>Courthouse</u> <u>Manhattan KS 66502</u> Plant or crop associated with damage/disease: Host common name: <u>Corn</u> Variety: <u>BR549</u> Planting date, age of plant or size: <u>April 15 or 6 weeks or 1'</u> Approximate date problem first appeared (MM/DD/YYYY): <u>05/20/2007</u> Did the problem show up all at once or gradually? <u>all at once</u> Plant parts affected: ☒ Leaves/needles ☒ Stem/stalk ☐ Flowers ☐ Fruit/seed ☐ Crown ☐ Roots ☐ Bulbs/rhizomes ☐ Tubers Problem distribution on the plant: ☐ Current season's growth ☐ Previous season's growth ☒ Bottom of plant ☐ Top of plant ☐ One side of plant ☐ Scattered ☐ Other Problem distribution and/or location within the site: ☒ Single Plant ☐ Scattered Plants ☐ Groups of Plants ☐ Entire Planting	Client's Name <u>U.R. Client</u> Address <u>914 County Rd 2300</u> <u>Manhattan KS 66502</u> Phone <u>555-1234</u> Is the problem getting worse or staying the same? <u>worse</u> Degree of injury: ☐ Light ☒ Moderate ☐ Severe Degree of Infestation: ☐ Light ☒ Moderate ☐ Severe Symptoms: ☐ Insect boring ☐ Browning/scorched ☐ Chewed ☐ Dieback ☒ Distortion/cupping/curling ☐ Entire leaf eaten ☐ Galls ☐ Holes chewed ☐ Leaf (Leaves) skeletonized ☐ Frass or excretions ☐ Cast Skins ☒ Marginal yellowing ☐ Poor growth ☐ Shot hole ☐ Stippling/speckling ☐ Stunted ☐ Webbing ☐ Yellowing
---	--

Describe the pattern of the problem in the field or area: Spotty with yellow nutsedge infested areas

Estimate number of insects per plant: 5

Number of plants infested: 8 acres

If any insecticides have been used, give:
Type: Chlorpyrifos Rate: 2 lb. a.i./acre Dates: 5/21/07
Date: 5/27/07 (Sent to Diagnostician)

Date: _____

Reply: _____

Figure 4. Insect Identification Laboratory diagnostic form

Authors

Bobby Brown, entomology diagnostician, and Phil Sloderbeck, entomologist

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-960

April 2007

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Fred A. Cholick, Director.