



Insect Identification Service

Instructions for Submitting Samples

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

Where to go for help

Contact your local K-State Research and Extension office. Agents can identify many common insects or consult with the insect diagnostic laboratory. The lab offers prompt and accurate identification of insects and related problems as well as information on insect biology, habits, damage, and control. Lab services include identification of noninsect arthropods, such as spiders, mites, ticks, centipedes, millipedes, etc.

Equipment

The local K-State Research and Extension office should have supplies on hand for submitting specimens including glass screw-top insect vials, mailing canisters, and submission forms (Figures 1–4).

Vials and canisters will not be returned. Additional supplies are available upon request and can be delivered in two to three weeks.

To preserve delicate and immature insects during shipping, vinegar is recommended. It is inexpensive and can be purchased at any local grocery store. **Do not use rubbing alcohol, ethyl alcohol, formalin, formaldehyde, or other similar preservatives because these substances are flammable, hazardous, and may violate**

shipping regulations. Keep in mind that water is not a preservative, and insects can discolor and decompose if shipped in plain water. Insect vials and mailing canisters remain the property of the insect diagnostic lab and should not be used for other purposes.

Procedures

To identify an insect or related problem, you will need to capture several without damaging them. Insects smashed with a flyswatter or rolled newspaper can seldom be identified.

Collect damaged plant or other material, if appropriate, and take it to the local agent. For help with identification, the agent can mail a physical sample or submit a digital image through the Plant Diagnostic Information System.

To process your request you will need 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 appropriate form from the list at the bottom. Be as accurate and specific as possible when providing information. This will help the diagnostician answer questions or solve the problem.

For small or soft-bodied specimens that must be examined physically in the laboratory, place the insect in a vial of vinegar to kill and preserve it. This procedure is necessary for aphids, gnats, and many immature insects. Shriveled, broken, or decomposing specimens cannot be identified. Do not fill the vial all the way to the top. Leave a small amount of air space to allow for expansion in case the sample becomes hot during shipping.

When shipping insects in vinegar, make sure the lid is on tight and secure the cap with tape. Wrap the vial

in a paper towel and seal inside a plastic bag. Put bag in box or mailing tube filled with packing material. Enclose the diagnostic form, seal package, and ship by surface mail (Figure 2). The K-State Research and Extension agent will mail the sample to the insect diagnostic lab.

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 crushproof box cushioned with tissue paper. Do not use cotton because legs



Figure 1. Screw-top vial

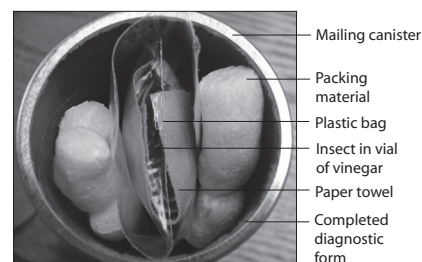


Figure 2. Components used for shipping insects.



Figure 3. Mailing canister

and antennae will tangle and break. Insects taped to index cards or mailed loose in envelopes arrive in pieces and cannot be identified. *Never mail live insects.* It may be illegal without proper permits.

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 plastic resealable bags, seal, and place in a sturdy cardboard box. Secure 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

Either live or dead material may be used for specimens to be used for digital imaging. In some cases, pictures of live specimens are preferable. Many caterpillars and soft-bodied insects lose their natural color or become dark when they die, even if placed in a preservative. Because identification manuals use color patterns to help distinguish different species, pictures of live specimens are often better than pictures of dead ones. Active specimens can be slowed down by placing them in a freezer or refrigerator for a short time before taking pictures.

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

The Plant Diagnostic Information System allows K-State Research and Extension agents to submit images and information for proper identification and quick response. In general, information 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. Most 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 and 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 Plant Diagnostic Information System are usually processed the same day. Sometimes the diagnostician will need to consult other sources. In case of delay, the diagnostician will inform the local agent.

Control recommendations

When control measures are requested along with identification, the insect diagnostic lab will refer the client to an appropriate K-State Research and Extension publication where solutions to many common problems can be found.

If there is not a 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 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.

- *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.
- *Insects in Kansas.* 2000. White, S. and Salsbury, 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.



Horticultural Insect Diagnostic Form

Agent's Name Ira C. Agent
 County Riley
 Address Courthouse
Manhattan KS 66502

Client's Name U.R. Client
 Address 914 Country Rd 2300
Manhattan KS 66502
 Phone 555-1234

Plant or crop associated with damage/disease:
 Host common name: Corn
 Variety: BR549
 Planting date, age of plant or size:
April 15 or 6 weeks or 1'
 Approximate date problem first appeared
 (MM/DD/YYYY): 05/20/2007

Is the problem getting worse or staying the same?
worse

Degree of injury:
 ___ Light ☒ Moderate ___ Severe

Degree of Infestation:
 ___ Light ☒ Moderate ___ Severe

Did the problem show up all at once or gradually?
all at once

Plant parts affected:
☒ Leaves/needles
☒ Stem/stalk
 ___ Flowers
 ___ Fruit/seed
 ___ Crown
 ___ Roots
 ___ Bulbs/rhizomes
 ___ Tubers

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

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

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: 2lb. a.i./acre Dates: 5/21/07

Date: 5/27/07 (Sent to Diagnostician)

Date: _____

Reply: _____

Entomology Diagnostician

Figure 4. Insect Identification Laboratory diagnostic form

Authors

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