USDA NRCS
Natural Resources Conservation Service

United States Department of Agriculture

**Suite 1321, Federal Building
100 West Capitol Street
Jackson, MS 39269**

June 1, 2000

MS BIOLOGY TECHNICAL NOTE NO.: BIOL -1

SUBJECT: FISH KILL ASSISTANCE

Purpose. To transmit information about updated guidance on collecting and delivering fish for disease/fish kill determinations.

Effective Date. Upon receipt.

In most cases, sick, dying or dead fish are the result of either a disease or some environmental condition that causes stress on the fish outright. The cause of a fish kill usually is not immediately obvious. Therefore, it is important to seek professional help as early as possible. The attached Mississippi State University Extension Service Information Sheet 667, "Selecting and Shipping Samples to Help Determine Cause of Fish Kills", provides the basic information and guidelines for seeking assistance. This document is public information and may be reproduced in part or in total if necessary. Information Sheet 667 can be accessed on the Internet at http://www.ext.msstate.edu/pubs/is667.htm. Also, Mississippi residents may get a printed copy of this publication through their county Extension offices. Additional publications and information about fish kills and/or common diseases may be accessed on the Internet at http://www.ext.msstate.edu/anr/wildfish/fisheries/fishkill.html.

Each Area and Field Office is to file and retain this note with the attached copy of Information Sheet 667 in the Biology Reference Manual, Revised January 2001. If you have questions about this information, please contact your area or state biologist.

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Acting State Wildlife Biologist

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Mississippi State University Extension Service Information Sheet 667	MS TECH NOTE NO. BIOL-1 June 2000

Selecting and Shipping Samples To Help Determine Cause of Fish Kills

The type and condition of a fish sample are important factors influencing accurate disease and fish kill examinations. Therefore, be sure to exercise care in obtaining adequate samples and in transporting fish to a diagnostic lab. It is a good policy to call the disease specialist before taking him a sample so that you will be expected. The disease specialists are interested in the welfare of the fish farmers and will be more than happy to assist in identifying and eradicating problems.

Diagnostic Samples *(Listed in order of preference from excellent to unusable.)*

1. Fish exhibiting behavioral symptoms such as these:

- lying lethargically in shallow water and not moving off rapidly when disturbed.
- hanging listlessly at the water's surface and not going down quickly when disturbed, or if they do go down, returning quickly to the surface.
- swimming rapidly in a circle or in an erratic manner.

Because these fish sometimes are hard to find and, more often than not, hard to catch, many farmers will make only a halfhearted effort to catch them. They then will resort to an easier-to-obtain, but less desirable sample. It is well worth your time; however, to obtain this type of sample since it offers the best chance of correctly identifying problems in the shortest time.
Excellent Sample: Probability of finding cause of death is high.

2. Live fish that exhibit overt physical symptoms such as these:

- open sores.
- light-colored, slightly eroded areas in front of dorsal fins or other parts of the body.
- yellowish areas inside the mouth cavity.
- eroded and light areas on gills.
- swollen, fused, or clubbed gills.
- eroded and hemorragic fins.

There are other symptoms but these will give a general idea of what to look for.
Excellent Sample: Probability of finding cause of death is high.

3. Dead fish that still have red gills and somewhat normal amounts of mucus and color.
Fair Sample: Probability of identifying the cause of death depends on how long the fish has been dead. The longer the fish remains in the pond, the poorer sample it makes. Tissues begin to break down, and normal putrefying bacteria attack the fish almost immediately.

4. Several fish taken at random from a seine sample.
Poor Sample: Probability of identifying the cause of fish loss is low since a majority of fish in the pond may be healthy. Sometimes you can get an indication of the cause of the problem by the number of species of parasites found on the fish.

5. Live fish caught by hook and line from several different areas of the pond.
Poor Sample: Probability of finding the cause of fish loss in the pond is very low. Healthier fish usually bite more readily than weaker fish; thus, a fish caught by hook and line will likely be free of parasites and pathogenic organisms. Occasionally, as in Example 4, you can get an indication of the problem by the number and types of pathogenic organisms found. This is especially true if the fish examined show about the same level of infection.

6. Dead fish that have lost body color and mucous coat and have white, mushy gills.
Totally Unusable Sample: Save your time and the disease specialist's time by not bothering with this type of sample. It is good management, however, to remove all dead fish from your pond each day. By daily removing the dead fish, you will be able to determine how rapidly the loss is increasing. You also will have an accurate record of your mortality at the end of the production year.

7. Water sample from the pond containing diseased fish.
Totally Unusable Sample: A water sample is of little value as a diagnostic aid in determining the cause of a fish kill unless a toxic substance is suspected. In this case, collect a one-gallon water sample in a clean glass container and send it along with the fish samples to the disease specialist. **However, the toxicity of some chemicals varies with the water hardness so it is a good idea to send a water sample with the fish sample to the specialist.**

Determining Factors in Fish Kill

If possible, send this information (along with the fish samples) to the disease specialist:

- Number of fish lost since the die-off started.
- Approximate number of fish lost each day.
- When the losses started:
  - date
  - time of day
- Number of surface acres per pond (or exact dimensions of the vat or holding tank).
- Average pond depth.
- Number of fish stocked in the pond.
- Condition of the bloom:
  Light -- The pond has visibility of 18 inches or more and has no accumulation of algae in the corners or on the down-wind side.
  Moderate -- The pond has a visibility of 12 to 15 inches and may have a moderate amount of algae accumulated in the corners or on the down-wind side.
  Heavy -- The pond has a visibility of 12 inches or less.
- The last time the pond was treated:
  Why was it treated?
  What chemical was used and how much?

Transporting and Shipping Samples

1. Place live fish in a plastic bag with no water and seal. Then place the bag in an ice chest containing crushed ice.
2. If the fish are to be hauled for a short distance, you may place them in a container or ice chest containing well-oxygenated water. Add a few chunks of ice to keep the water cool.
3. Fish can be frozen for transport to the lab when there is **no other way** to keep them from spoiling. Frozen samples are hard to work with and should be avoided whenever possible. Frozen samples are acceptable if they are for pesticide analysis.
4. Ice down immediately all dead fish collected but which are still acceptable for examination (red gills, etc.), as in Example 1, to retard further tissue breakdown.
5. Make arrangements for shipping or delivery. Bus shipment is often the best alternative. Samples should arrive at the lab within 12 to 18 hours.
6. Call the lab and provide details on case and anticipated arrival time. Mississippi State University operates two labs, one on campus (325-3432) and one at the Delta Research and Extension Center (686-9311).

Contacts

For assistance in determining the cause of fish kills, contact your county Extension agent; or **Mrs. Lora Hanson**, (325-3432) at College of Veterinary Medicine, Mississippi State University; or **Dr. Mike Johnson**, (686-9311) at Delta Research and Extension Center, Stoneville.

Information Sheet 667
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