

APPENDIX H

Jar and Stick Tests

The Jar and Stick Tests

Option for testing your pond:

There are a couple of simple tests that a pond owner or lake manager can do, at no cost, to determine whether a green pond has a blue-green algae community, or if any algal material visible at the water surface is a blue-green surface scum.

NOTE: No test is 100% perfect, and that includes the jar test for blue-greens. The test relies on the buoyancy adaptation of most free-floating (planktonic) blue-green algae. In Kansas, bloom complaints are overwhelmingly the result of the forms that are buoyant. However, there is a small possibility (<2%) that the algae in your particular test happen to be non-buoyant species for blue-greens, resulting in a false negative test. Likewise, some swimming forms of non-blue-green algae (like Euglenoids) may form a surface layer during a jar test, resulting in a false positive. Fortunately, most *Euglena* blooms will be reddish in color rather than green, allowing for their identification. Although the jar test does provide a quick and inexpensive way to confirm whether you have a blue-green community in your lake, it does not tell you what species are present, nor does it tell you whether they are actually producing toxins. Be aware, too, that just having blue-green algae present does not mean your pond is automatically hazardous. Many lakes and ponds in Kansas typically have blue-green algae in them. Hazardous conditions occur when the number of blue-green algae is large, and composed of species capable of generating toxins. For that information, a microscopic examination of the water, combined with a chemical test for toxins, would be required for a more complete picture.

The Kansas Department of Health and Environment only tests samples from public waterbodies. Kansas State Veterinary Diagnostic Lab can assist with issues regarding private waterbodies. If you are conducting one or both of these tests on your private farm pond or lake and you determine that you do have a blue-green bloom occurring in your pond, you may obtain further assistance by contacting them.

THE JAR TEST PROCEDURE

Purpose

Look out over the pond and see if the water looks very green. To decide whether the “green” is blue-green algae in the pond, or just an overabundance of some of the more beneficial types of planktonic algae, a simple test can be conducted called the “jar test.”

Follow this step by step process to make an initial assessment of the pond in question.

Materials

- Clear jar (pint to quart size) – A Mason (canning) jar or a store-bought pickle jar with the label removed works well.
- Rubber or latex gloves.
- Plastic bag or other containment device

Procedure

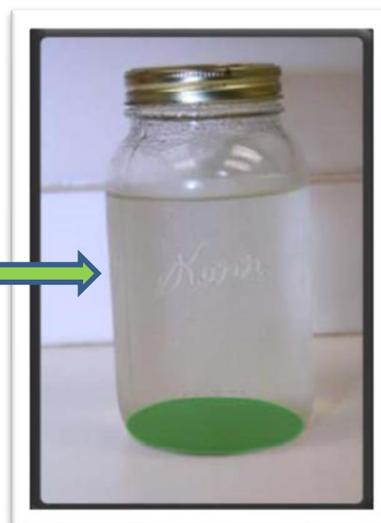
1. Find an appropriate clear glass jar with a screw top lid.
2. For safety reasons, use rubber or latex gloves to collect a sample of water from the pond in question to prevent skin exposure.
3. Collect the water just below the surface of the water.
 - a. DO NOT collect sample directly from the surface but collect just under the surface to avoid collecting just the scum on the top layer of the water.
4. Fill the jar about $\frac{3}{4}$ of the way full with the pond water. (See Photo 1.)
 - (DO NOT fill the jar completely to the top. Algae will give off gases and may cause of buildup of pressure inside the jar causing it to break.)
5. Wipe off any scum that may be on the outside of the jar.
6. Screw the lid onto the jar.

Photo 1 – Initial Samples



7. Be aware that the jar may be contaminated with any toxins present in the water. To avoid contamination of other surfaces, place the jar in a plastic bag or other containment device.
8. Place the jar in a cold refrigerator and leave it completely undisturbed overnight.
9. The next day, **carefully** remove the jar from the refrigerator and look to see where the algae have accumulated.
 - a. **IT IS VERY IMPORTANT** that you do not shake or agitate the jar in any way. If you do, this will mix the algae into the water again and you will not get usable test results.
9. If the algae are all settled out near the bottom of the jar, then that is a likely indication that the lake does not have a lot of blue-green algae growing in it. (See arrow on Photo 2.)

Photo 2 – NO - Blue-greens
(Negative)



If the algae have formed a green ring around the top of the water in the jar, or just seem to be collected at the air/water divide, there is a strong possibility that the pond does have a blue-green algae community present. (See arrow on Photo 3.)

Photo 3 – YES - Blue-Greens
(Positive)



THE STICK TEST PROCEDURE

Purpose

Look out over the pond and see if a mat of green material is floating on the surface. Is it blue-green algae forming a surface scum, or is it a mat of floating filamentous green algae (often called “fisherman’s moss” or “string algae”)? A simple test to determine what the material might be is called the “stick test.”

Materials

- Sturdy stick – Make sure it is long enough to reach into the water without getting algae on your hands.
- Rubber or latex gloves

Procedure

1. Find a sturdy stick.
2. Put rubber or latex gloves on before attempting to retrieve a sample of the green material from the pond to prevent skin exposure.
3. Thrust the stick into the surface mat and slowly lift out of the water.
 - a. Make sure you do not fall into the water while attempting to retrieve material.
4. Look at the end of the stick to see what came out of the water.
 - a. If the stick comes out looking like it has been thrust into a can of paint, the mat on the pond is likely to be a blue-green algae scum.
 - b. If the stick pulls out strands that look like green hair or threads, the mat on the pond is likely filamentous green algae. (Although filamentous green algae can be a nuisance when over-abundant, they do not pose a danger to your health.) (See Photo 1.)

Photo 1 - Filamentous algae



Note: The stick test can fail when a particular type of blue-green alga is present. This type of alga is called *Lyngbya wollei*. This species of blue-green alga can form tough filamentous mats that float to the surface, similar to the mats formed by harmless filamentous green algae. However, *Lyngbya wollei* typically will have a very putrid sewage-like odor, which filamentous green algae do not. *Lyngbya wollei* mats also will often release a purple pigment in the water around them, which is something filamentous algae do not do. (See Photo 2.)



Photo 2 - *Lyngbya wollei*