One Mean Weed![1]

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Invasive Species Series

One Mean Weed!

Sneak Peek
Students will be introduced to plant dispersal. Students will explore the Autumn Olive bush and specifically the fruits and roots of the plant. They will also be introduced to the process of nitrogen fixation and how the root system of plants help this process. This activity incorporates observation skills, math skills, and critical thinking.

Aligned with the following Sunshine State Standards and FCAT Benchmarks for grades 6-8:
SC.D.2.3.2 AA SC.G.2.3.4 AA
SC.F.1.3.7 CS SC.H.2.2.1 CS
SC.G.2.3.3 CS
AA = annually assessed
CS = content sampled

Objectives:

Students will:

- Become familiar with the reproductive ability of an aggressive plant.
- Demonstrate understanding of the concept that roots help a plant to compete better.

Materials:

- Specimen of Autumn Olive, ***Elaeagnus umbellata,*** including fruits (this can be obtained by collecting or ordering from the Internet - just look up "order autumn olive"). Remember not to let seeds or plants get into the environment.
- Cups in which to collect fruit.
- Scale to weigh fruit.
- Surface on which to crush fruit.
- Hand lens.

photographs from The Florida Aquarium

Background:

How does a fruit-bearing plant spread?

A ***disperser*** is an organism that spreads or distributes fruits and/or seeds from a stationary parent plant by eating the fruit and excreting the seeds in another location.

Autumn Olive (*Elaeagnus umbellate)* shrubs have berries that many animals eat. This is a ***perennial*** shrub (grows year-round) that can grow to twenty feet. The more berries that are eaten, the more widely the shrub will be dispersed.

How do the roots of a plant help it grow?
Nitrogen is a nutrient required in large amounts as an essential component of proteins, nucleic acids and other cellular constituents. Some plants have bacteria in nodules on their roots that fix nitrogen. By this ***nitrogen fixation*** process, plants convert nitrogen gas into ammonia. The ammonia can be used for plant growth. Autumn Olives have roots that allow a lot of nitrogen to be collected.

Procedure:

1. Each student should be given 20 fruits in a cup. The students should weigh each cup of fruit and determine the weight of an individual berry by dividing the total weight by 20.

2. Have students determine how many fruits must be collected to weigh 8 pounds, which is how much fruit one plant can produce.

3. Once the fruits have been weighed, the students should squash the berries and determine how many seeds are in each fruit. Have the students think about how many seeds there would be in 8 pounds of fruit and the consequences of that many seeds being dispersed in the landscape.

4. Divide the students into groups of three and have them observe Autumn Olive roots with a hand lens. The instructor should prepare the students by describing the form of root nodules and then allow the groups to locate the nodules on their samples. While studying the root samples, the students should also observe whether Autumn Olive has one long root or many short fibrous roots, because nutrient absorption will be affected by the form of roots.

Rapping It Up!

1. What type of animals do you think like to eat Autumn Olive berries? (Think about how big the berries are and what animals could reach them.)

2. Did your Autumn Olive have one long root, or many short fibrous roots? Knowing that Autumn Olive "fix" nitrogen very well, which root structure do you think helps this process?

3. Why do you think Autumn Olive bushes spread easily in the environment?

Glossary:

Disperser - An organism that spreads or distributes fruits and/or seeds from a stationary parent plant.

Nitrogen - A nutrient required in large amounts as an essential component of proteins, nucleic acids and other cellular constituents.

Nitrogen fixation – Organisms cannot use nitrogen gas (N_2), but nitrogen gas can be "fixed" or converted into ammonia by bacteria.

Perennial – A plant that is lasting or active through the year or many years.