**Elaeagnus umbellate**

**Invasive Species Organization Advertisement**

Autumn olive is a deciduous shrub from three to twenty feet in height that is easily recognized by the silvery, dotted underside of the leaves. Small, yellowish flowers or red, juicy fruits are abundant and occur on clusters near the stems. Autumn olive is native to China and Japan and was introduced into America in 1830. Since then, it has been widely planted for wildlife habitat, mine reclamation, and shelterbelts. These plantings were often done because the fruits of *Elaeagnus umbellata* are used by many different types of animals as food. However, because the fruit is so desirable to wildlife, birds and other animals have spread the plant throughout a wide range.

Autumn olive is found from Maine to Virginia and west to Wisconsin. It is drought tolerant and thrives in a variety of soil and moisture conditions. This trait allows it to invade grasslands, fields, open woodlands, and disturbed areas. It threatens native ecosystems by outcompeting and displacing native plant species, creating dense shade, and interfering with natural plant succession and nutrient cycling. Because autumn olive is capable of fixing nitrogen in its roots, it can grow on bare mineral substrates.

Do not plant autumn olive. Individual young plants can be hand-pulled, ensuring that roots are removed. If it is burned, it resprouts from the stump. If it is cut, it still resprouts abundantly. Cutting, in combination with herbicide application, is effective. Hedges can be cut down using a brush type mower, chain saw, or similar tool, and stumps treated with a systemic herbicide like glyphosate or triclopyr. Application of these herbicides to foliage is also effective, but is likely to impact non-target species. Herbivorous animals are not known to feed on it, and few insects seem to utilize or bother it. Canker disease is occasionally a problem, but not enough to be useful as a control agent.

**The Problem with Invasives – Math Problem**

George and Noreen Lapse live next to a beautiful 40-acre wood and enjoy the birds that live there. They are interested in attracting some of the birds into their yard for a closer look. They visit the nursery and purchase a one-year-old autumn olive for their yard. They have heard that the shrub can be invasive, so they vow to watch it carefully. If they see any signs of the shrub spreading into the woods, they will chop it down immediately. Three years later, Noreen gets a job across the state, and the Lapses move. As they drive out of the yard, they sigh as they pass their autumn olive shrub. They are disappointed that it is just now beginning to bear fruit. Someone else will get to enjoy the birds in the yard. When George and Noreen return to visit five years later, will they be surprised?

Calculate how many autumn olive shrubs there will be when the Lapses return and the shrub is 9 years old. Assume all of the seedlings survive. Use a chart to keep track of the number of mature plants, the seeds produced, and the number of immature plants. Use this information to help you make your calculations:

- Autumn olive shrubs mature in three to five years. Use an average of four years.
- Mature shrubs produce 40,000 to 120,000 seeds. Use an average of 66,000 seeds per year.
- Seeds can germinate over a wide range of conditions anytime during the growing season. Long, cold winters scarify (scratch) the seed coats and increase germination rates.
  Up to 90% of the previous season’s seeds can germinate in the next year.