Biological Control of Purple Loosestrife

Purple Loosestrife:
Purple loosestrife (Lythrum salicaria) is an aggressive invasive weed that plagues waterways throughout the United States. It was initially imported as an ornamental plant in the early 1800’s. By 1920 it had escaped cultivation and began invading waterways. Purple loosestrife is an aquatic perennial with a square stem and opposite, entire leaves. The most distinct characteristic of purple loosestrife are the tall spikes with bright purple flowers. The main method of reproduction is through seed. Purple loosestrife plants can produce up to 2.7 million tiny seeds per year. These seeds are easily spread by wind and water. Purple loosestrife usually develops in homogenous stands that can outcompete native flora. Native birds and wildlife do not feed on purple loosestrife, and does not provide adequate cover for wildlife. Duck populations as well as populations of other species that rely on native flora decrease when purple loosestrife invades.

Biological Control of Purple Loosestrife:
One root boring weevil and two leaf feeding beetles have been used on purple loosestrife since 1992. The most commonly used are the two leaf feeding beetles, Galerucella calmarienis and G. pusilla. These beetles are light brown with a dark stripe on the thorax. Both beetles overwinter as adults. The adults lay eggs in the summer in clusters of 2-10. A single adult Galerucella spp. can lay up to 400 eggs per year. Eggs hatch after about one week. The damaging stage of Galerucella spp. is the larval stage which feeds on stems, leaves and flowers. In most areas Galerucella spp. experience one generation per year. The best time to collect Galerucella spp. is from late May through June. Collecting should be done by shaking infested purple loosestrife plants over sweep nets followed by aspirating insects.

The root boring weevil, Hylobius transversovittatus, is an excellent supplemental biocontrol and should be released along with Galerucella spp. H. transversovittatus adults are large (13mm long) and nocturnal. Adults overwinter in soil or leaf litter and emerge to begin laying eggs in June. They are most active from June through August. One adult H. transversovittatus can produce 200 eggs per year. Eggs are laid singly on the stem near the roots. Larvae (the damaging stage) mine inside the roots of purple loosestrife and emerge from July through October. Larvae can hibernate in all instars.
An adult *H. transversovittatus* can live for 2-3 years. Because of their nocturnal nature, *H. transversovittatus* adults are difficult to locate in the daytime, but feeding damage can be observed in July and August. Collection of *H. transversovittatus* should be done after sunset. Adults will drop off of plants when disturbed. Shake plants over sweep nets or simply pick these weevils off of plants.

**Integrated Pest Management of Purple Loosestrife:**

Biological control agents of purple loosestrife do not react well to pesticides. Impact of herbicide has not been studied with purple loosestrife biocontrol. It is known insecticides used for mosquito abatement will kill these biological control agents. Selecting a site with no free standing water and communicating with local mosquito abatement areas can help to establish biocontrol agents. Biological control agents for purple loosestrife overwinter in leaf litter. In areas where flooding occurs, biological control insects will drown. Select areas where there will be adequate litter for insects to overwinter. Once established, biological control agents can have 100% control of a purple loosestrife infestation. For small, easy to access areas, pulling or using chemical control with rodeo or round-up labeled for aquatic use is the best option. Biological control is an excellent alternative to chemical control in: 1) large infestations; 2) areas that are difficult to access; and 3) aquatic areas where chemical control is undesirable.