

Invasive Species Update: Chaff Flower

Chaff flower (also called Japanese chaff flower, *Achyranthes japonica* (Mik.) Nakai) is an invasive plant that is spreading fast. It is easily introduced to new areas through seeds that move along waterways and stick onto fur and clothing. It is already a major problem in Kentucky, Ohio, Illinois, Indiana and has been reported as far north as islands in Lake Erie.

A threat to streamsid es and forests

Chaff flower is a perennial herbaceous plant that grows densely, crowding out other plant species (Fig. 1).

Scientists and land managers are concerned about chaff flower because of the speed with which it takes over after it arrives in an area. It forms dense monocultures in sensitive riparian habitats (Fig. 1) which negatively impacts native plant diversity and regeneration as well as habitat for other species and water quality.

Where is it?

- Chaff flower is native to Asia.
- Its first detection in North America was in eastern Kentucky in the 1980s. Since then, it has rapidly spread, especially along the Ohio River, and more recently down the Mississippi River. There is also a large population in the Atlanta, Ga., area (Fig. 2).
- Chaff flower is a habitat generalist, and it can grow nearly anywhere. While it prefers and has spread most rapidly along stream systems and bottomlands (Fig. 3) it also thrives in a wide range of other habitats including roadsides, ditches, field edges, and gardens.
- It prefers partial sun and moist soils, but it can also grow in shady or drier conditions.

What does it look like?

- Perennial herbaceous forb, 3-5 feet tall.
- Opposite leaves with smooth edges with very prominent, arching veins and pointed tips (Fig. 4).

- Status: Highly invasive.
- Grows densely and crowds out other plant species.
- Produces abundant seed that stick to clothes and fur and can be easily spread.
- Initial introduction common in riparian areas but also can move into uplands and other areas.
- Preventing accidental movement of seeds is key to slow its spread.
- A range of other management options exist including herbicide control.



Fig. 1. Chaff flower can form a dense stand, crowding out other plant species. Photo credit: Ellen Crocker, University of Kentucky

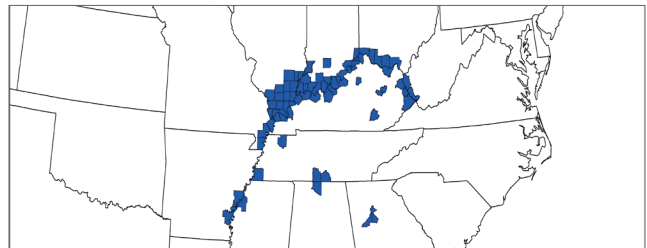


Fig. 2. As of 2021, chaff flower's distribution was largely in counties adjacent to the Ohio and Mississippi rivers with many other more recent infestations outside of this range. Photo credit: Chris Evans, University of Illinois



Fig. 3. Chaff flower's initial spread typically follows along riverbanks but it can also spread into upland habitats. Photo credit: Ellen Crocker, University of Kentucky

- Leaf color can vary, from reddish purple to bright green.
- Stems are squarish and nodes where leaves are attached are inflated and frequently have a reddish color (Fig. 5).
- Individual flowers are small and green, not very distinctive, but occur in a distinctive bottlebrush spike (Fig. 6).
- As flowers mature into seed this spike elongates with fruits (papery chaff over a single seed) held along stem (Fig. 7).
- Two stiff hairs (bracts) on the backs of the fruits make them stick to clothes and fur (Fig. 8).
- Leaves die back in fall, but stem (and the seeds on it) remain through winter turning a tan light brown color.

Look alike

Chaff flower can be hard to distinguish from other plants until flowering, at which point the bottlebrush spike is distinctive. Venation on leaves of small plants can look almost like a young dogwood or basil plant. Other look-alikes include:

Devil's horsewhip (*Achyranthes aspera*)

This species is also an exotic invasive. The vegetative parts look very similar to chaff flower. Key distinguishing features: Flowers tend to have more purple or red color compared to chaff flower and there are feathery protrusions in between the stamens of the flowers (called Pseudostaminodes). These protrusions are smooth in chaff flower. To date, Devil's horsewhip is only known to occur south of the invasive range of chaff flower.



Fig. 4. Chaff flower has opposite leaves with smooth margins and prominent venation. Photo credit: Ellen Crocker, University of Kentucky



Fig. 5. Stems of chaff flower have a square shape and can have a red color, particularly at nodes. Photo credit: Chris Evans, University of Illinois



Fig. 6. Flowers are green and arranged in a bottlebrush-type spike that elongates as seeds develop. Photo credit: Chris Evans, University of Illinois



Fig. 7. Seeds of chaff flower develop on long spikes that persist through the winter as a tan hatch. Photo credit: Chris Evans, University of Illinois



Fig. 8. Stiff bracts at the base of seeds allows them to stick to fur and clothing, making it easy to accidentally transport chaff flower. Photo credit: Chris Evans, University of Illinois

Iresine (*Iresine rhizomatosa*)

Key distinguishing features: Iresine flowers are white and occur in a large, loose cluster at the top of the plant. The leaves are also opposite but narrower and more elongated compared to chaff flower leaves.

Lopseed (*Phryma leptostachya*)

Key distinguishing features: Leaves of lopseed are wide and coarsely toothed along the margins, as compared to the smooth, entire margins on chaff flower. Lopseed fruit have prominent points that arise from the front of the fruit whereas the barbs on chaff flower arise from the base of the fruit.

Management

Managing chaff flower requires patience and persistence. Prevention is better than removal. While occasional small plants can be pulled, hand pulling is not an effective option for larger plants because the root system is difficult to remove. If timed right, mowing and cutting can be used to stop that year's seed set, but that won't kill the plant once it has grown more than three nodes in height. Late-season prescribed burns can kill adult plants but may not slow its spread because of seed bank recruitment. There are many herbicide options for spraying the foliage that will also kill the root system. Control should be conducted before chaff flower produces seed in late summer/ early fall to reduce the risk of moving seed on equipment and clothing.

Read and follow all label instructions when using herbicide. Care should be taken to avoid non-target impacts. When applying herbicides near water, use formulations labeled for aquatic use. The following herbicides have been shown to be effective at controlling chaff flower: 2,4-D ester, triclopyr amine, glyphosate, aminopyralid, triclopyr and fluroxypyr mix, and aminopyralid and metsulfuron mix.

Stop the spread

- Chaff flower readily spreads via seed and preventing accidental seed introduction is key for slowing its spread.



Fig. 9. Immature, pre-reproductive plants.
Photo credit: Chris Evans, University of Illinois

- Avoid working in, walking through, or driving vehicles through areas with lots of chaff flower while plants are seeding and make sure to clean off shoes, clothes, equipment, and animals after traveling in infested areas.
- Continued monitoring for new arrivals from seed and the seedbank is key to preventing re-establishment of chaff flower as well as other invasive plants (Fig. 9).

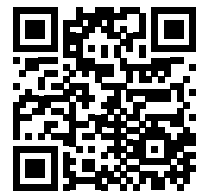
Report sightings

You can help track chaff flower and other invasive plants by reporting sightings through EDDMaps. Either download the app or report plants through the website: www.eddmaps.org.

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go.illinois.edu/chaffflower



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