# Identification of Common Ohio Roadside Weeds. Field Bindweed (*Convolvulus arvensis* L.)

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Field bindweed (*Convolvulus arvensis*) which is also known as wild morning glory, small-flowered morning glory, bindweed, and creeping Jenny is considered one of the most invasive weeds in agriculture and horticulture fields world-wide. It is a native of Europe and Asia; however, it has spread throughout the world and ranks it as one of the world's ten worst weeds (Holm et al., 1977). It commonly occurs in two-thirds of Ohio's counties (OSU, 2018). However, it is not a noxious weed according to the Ohio noxious weed act (Ohio Administrative Code, Chapter 901:5-37). Nonetheless, it is on Ohio's "Prohibited" Noxious Weed Seed list and that of Michigan's, Minnesota's, Indiana's and Wisconsin's, and on the "Restricted" list for West Virginia, to name a few. It is also on Michigan noxious weed list (USDA, 2002). It is common to see field bindweed along roadsides, trailing on the ground or climbing and twining along fence rows and other vegetation with stems reaching up to 5 ft. (1.5 m) or longer. Stems emerge in spring, and it flowers from May till September (Balicevic et al., 2014). When not competing with other plants, a bindweed seedling may develop a root system that will penetrate to a depth of 4 feet (Peterson and Stahlman, 1989). With its rapid growth, it covers and suffocates young seedlings, invading crops and decreasing yields.

## Similar Weeds

Field bindweed is confused with at least two other vining weeds, such as hedge bindweed (*Calystegia sepium*) which is in the morning glory family or Convolvulaceae as is field bindweed. Field bindweed and hedge bindweeds are alternate, one per node (Alex, 2003). The leaves of field bindweed have a rounded tip (Fig. 1A) and hedge bindweed leaves are arrowhead shaped tip (Fig. 1B). Also, the leaves of field bindweed are smaller, have rounded leaf bases and outwardly divergent lobes (hastate) (Fig. 1A) and hedge bindweed lobes are cut squarely (truncate) (Fig. 1B and C) (Uva et al., 1997).

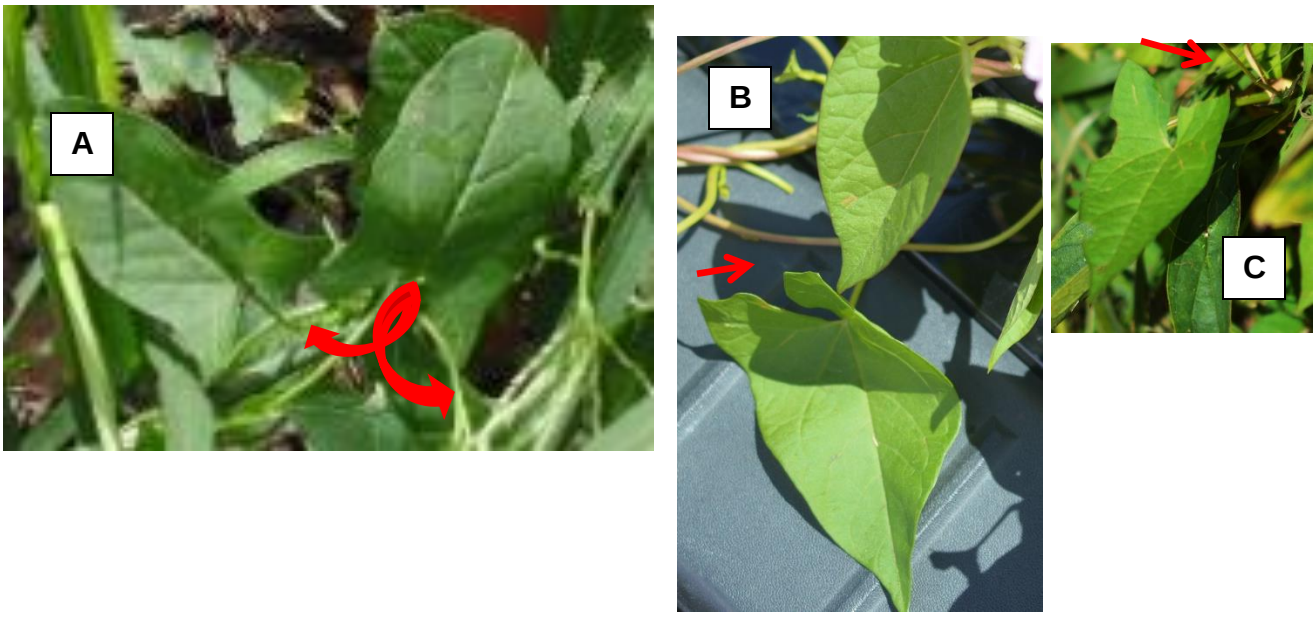


**Fig. 1. A, B and C. A. (left)** Field bindweed (*Convolvulus arvensis*) leaves, with their characteristic rounded tip and leaf bases and outwardly divergent basal lobes (hastate) (indicated by red arrows on A). (Picture by: H. Mathers, 2017). **B and C. (middle and right)** Conversely, the hedge bindweed (*Calystegia sepium*) leaves have arrowhead shaped tips, are larger and have basal lobes cut squarely (truncate) (See red arrow on B and C).

Another very important characteristic that helps identify hedge bindweed from field bindweed are their flower shapes and bases. The flowers of field bindweed are smaller 0.75 to 1 in. long, with white petals, sometimes pink, fused into a funnel-shaped tube (Fig. 2A) (Uva et al., 1997); whereas, the flowers of hedge bindweed are 1.25" to 3" long, light pink, trumpet shaped and have a pair of distinctive green bracts on the flower stalk (Fig. 2B) (Alex, 2003).

**Fig. 2. A. (left)** Field bindweed (*Convolvulus arvensis*) smaller 0.75 to 1 in. long, white, funnel-shaped flowers with bracts some distance below the flower. **B. (right)** Hedge bindweed (*Calystegia sepium*) with larger 1.25" to 3" long, light pink, trumpet shaped flowers with two distinctive green bracts on the flower stalk (Picture by: H. Mathers).

Additionally, wild buckwheat (*Polygonum convolvulus*) is also often confused with field bindweed even though it is a member of the smartweed family or Polygonaceae (Alex, 2003). All smartweeds have an ocrea (a thin membranous sheath arising with the leafstalk) that can be found at each node (Fig. 3A), is colorless or faintly greenish yellow (Alex, 2003). Just like the two bindweeds the leaves are alternate; however, unlike the bindweeds the leaf basal lobes pointed toward the petiole (Fig. 3B). Wild buckwheat also has small inconspicuous flowers about 0.16 inches long, typical of the smartweed family (Uva et al., 1997) (Fig. 3C). The leaf tip is arrow-shaped like hedge bindweed but again the basal lobes are not truncate like hedge bindweed and prominent ocreas are present (Uva et al., 1997). Wild buckwheat is also an annual.

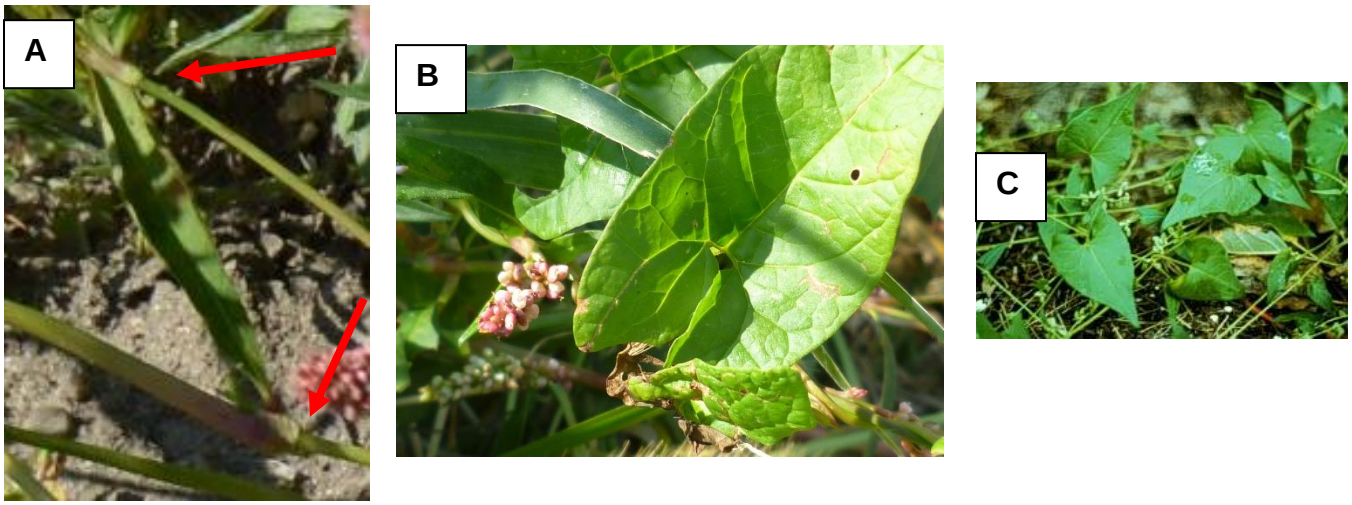


**Fig. 3. A, B, and C. A. (left)** Wild buckwheat (*Polygonum convolvulus*), like all members of the smartweed family, have ocrea at each node (red arrows show the ocrea). The leaf of wild buckwheat is arrow-shaped **(B and C)** but the basal lobes unlike either bindweed species pointed toward the petiole. **B. (middle)** Unlike either bindweed species terminal and **C. (right)** axillary clusters of inconspicuous flowers distinguish it from either bindweed species (Pictures by: H. Mathers, 2017).

## Conclusion

Field bindweed (*C. arvensis*) is a noxious and highly invasive plant as is hedge bindweedl. In terms of heavy-metal contaminated site remediation, however, it may be the one of the best tools available. Field bindweed shoots exposed to 20 mg $l^{-1}$ of the heavy metals, cadmium (Cd), chromium (Cr), and copper, demonstrated capability to accumulate more than 3800 mg of Cr, 1500 mg of Cd, and 560 mg of Cu per kg of dry tissue (Gardea-Torresdey, 2004). Several studies have shown *C. arvensis* is a suitable candidate for the phytoremediation of Cd(II), Cr(VI), and Cu(II) contaminated soils (Del Rio et al., 2002; Fabiszewski, 1983; Gardea-Torresdey, 2004). Furthermore, the concentration of Cr determined in the dry leaf tissue (2100 mg kg−1) indicates that *C. arvensis* could be considered as a potential Cr-hyperaccumulator plant species.

## References

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