

Weed Biology & Management

Biology and Management of Barnyardgrass (*Echinochloa crus-galli*) in Christmas Tree Production



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Barnyardgrass is originally from Europe and India and now ranges in both temperate and tropical habitats. It is a major weed species in Christmas tree production as it can cause serious competition in the field. A member of Poaceae family, barnyardgrass is a summer annual grass weed. It prefers rich, wet soils and low to medium altitudes, but can grow in other topographical areas as well.

Biology of Barnyardgrass:

Habitat of barnyard grass includes fields, waste places, ditches, marshes, wet meadows, floodplains and along lakeshores and stream banks. Plants are often prostrate unless forced upward by competition with other plants. Stems may be solitary or in small tufts and red near the base (Fig 1). Stems of barnyardgrass can be erect or reclining at the base and can reach up to 6.6 feet tall. Leaves are flat, 4 to 12 inches long and 0.2 to 0.6 inch wide. The panicle is 2 to 8.4 inches long, upright or nodding. It has a fibrous root system. Barnyard grass reproduces by seed. It is self-pollinating and a prolific seed producer. Barnyard grass begins emerging in late spring after soils warm up, reaches peak emergence in early June and continues to emerge sporadically until September. The inflorescence will form about 40 days after emergence if days are short, but several months may be required for plants emerging in May. Seeds mature about 20 days after flowering. It completes its development in 42-64 days. Each plant can produce up to 40,000 seeds. Seeds are often brown or red at maturity (Fig 2).

The success of barnyardgrass is attributed to prolific seeding, seed dormancy, ability to grow rapidly and flower in a range of photoperiods, and relative resistance to herbicides. Barnyardgrass can grow and flower in photoperiods ranging from 8 to 16 h but prefers the latter. Late summer flushes can still produce seed, because the plant sacrifices vegetative growth for quick flowering. Depending on photoperiod, seed dormancy ranges from 0 to 48 months. Seed is reported as 100% viable after 6 to 8 years dry storage. Barnyardgrass shows great plasticity depending on the level of competition, soil fertility, soil moisture and daylength. In

Series for Christmas Tree Production



Figure 1. Barnyardgrass growing in small tufts and reddish color near the base.



Figure 2. Seed head of barnyardgrass.

favorable conditions, it is capable of producing a large, competitive plant with a large number of panicles. In poor conditions or when exposed to short days, the plant may be small with only a few small panicles.

Management of Barnyardgrass

Non-chemical control: Regulation of weed seed production is the key to successful prevention. Prevention by cleaning equipment and using weed-free and fresh, uncontaminated soil is the best course of action. Regular scouting in the field and controlling weeds along farm roads is always suggested to manage the weed species at an early stage. Cultivation and mowing can be helpful in preventing a shift to species that are tolerant of herbicides or other practices.

Chemical control: Chemical control includes application of preemergence and postemergence herbicides. Preemergence herbicides need to be applied either before germination of the weed seeds or just after the germination, when the seedlings

are very small. Following are some of the preemergence herbicides that are labeled for use in Christmas tree production and have shown good control of barnyardgrass: prodiamine (Barricade), dimethenamid-P (Tower), indaziflam (Marengo), pendimethalin (Pendulum aquacap), hexazinone (Velpar), and simazine (Princep) (Zandstra and O'Donnell, 2018). Postemergence herbicides are applied at later stages, and they are most effective when applied to young actively growing weeds that have not reached their reproductive stages. Glyphosate (Roundup ultra) and fluzifop-p (Fusilade) have shown excellent control of barnyardgrass (Zandstra and O'Donnell, 2018). It is highly recommended to read the manufacturer's label of the herbicides before application and make sure the application timing is right and the herbicide is safe for the Christmas tree varieties. ▲

REFERENCE:

Zandstra, B. and J. O'Donnell. 2018. Weed control in Christmas trees. Michigan State University Extension bulletin E3237.

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