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Giuliano Galdi, Agronomy and Weed Management Advisor – gcgaldi@ucanr.edu

Weed Management in Corn

Effective weed management is crucial for corn growers to maximize yields and minimize costs. Understanding the types of weeds present is essential for tailoring an herbicide program that meets these goals.

Corn grown for silage can be affected by weeds differently than corn grown for grain. Beyond reducing yields, weeds can negatively impact the digestibility and protein content of silage. Some weeds may even be toxic to livestock and weed seeds in silage can spread to other fields through manure. While many weeds can grow in California corn fields, some pose particular challenges.

Barnyardgrass (Fig. 1 & 2) is one of the most prevalent weeds in corn and can attract armyworms, which may eventually migrate to the crop. Preplant herbicides such as s-metolachlor (Dual Magnum), alachlor (Micro-Tech), and EPTC (Eradicane) can control barnyardgrass. Pendimethalin (Prowl) can be applied after cultivation to take care of germinating seeds. For post-emergent control, nicosulfuron effectively manages barnyardgrass up to 3 inches in height, and foramsulfuron can provide control for weeds up to 4 inches tall.



Figures 1 & 2: Flower head (left) and young barnyardgrass (right).

Nutsedge can be highly competitive with young corn plants. To effectively manage its growth, cultivation at least 4 inches below the top of the bed before planting can help control sprouting nutsedge. A second cultivation after crop emergence is also essential. For pre-emergent weed control, s-metolachlor (Dual Magnum) and alachlor (Micro-Tech) provide satisfactory control of yellow nutsedge (Fig. 3). EPTC (Eradicane) effectively manages both purple (Fig. 4) and yellow nutsedge. For post-emergent control, halosulfuron (Sanda), either alone or in combination with dicamba (Yukon), can effectively target both types of nutsedge. Additionally, using glyphosate along with cultivation can also be effective in Roundup Ready corn.



Figures 3 & 4: Flowering yellow (left) and purple (right) nutsedges.

Johnsongrass (Fig. 5) is particularly problematic in fields with drainage issues, making prevention essential. This weed spreads efficiently through seeds carried by irrigation water, manure, and lagoon water. To manage johnsongrass effectively, pre-emergent herbicides such as EPTC, s-metolachlor, and alachlor can be used to control it before it emerges. During the growing season, glyphosate can be applied between crops or with Roundup Ready corn. Additionally, nicosulfuron (Accent) is effective when sprayed on johnsongrass that is up to 1 foot tall, while foram-sulfuron is a suitable option for targeting both seedlings and established weeds.



Figure 5: Mature plant of johnsongrass

Broadleaf weeds, including pigweeds, lambsquarters, Palmer amaranth, annual morningglory, purslane, and field bindweed, can be particularly problematic for corn crops. The same pre-emergent herbicides effective against grass weeds and nutsedges can also control some broadleaves such as nightshades and purslane. EPTC is also effective against morningglory and lambsquarters. For post-emergent control, bromoxynil (Buctril) works for small seedlings, while carfentrazone (Shark) effectively targets larger weeds. Foramsulfuron (Option) can be applied to broadleaf weeds up to 3 inches tall, and additional options include metribuzin (Sencor) and nicosulfuron (Accent). Always follow product labels for specific recommendations and crop safety, especially for metribuzin.

Key Steps for an Effective Weed Management Program in Corn

Field Scouting: regular field scouting is vital for developing an effective weed control strategy. Early-season assessments help evaluate the effectiveness of pre-emergent herbicides and identify weeds growing in and between rows. Timely scouting allows growers to determine if post-emergent herbicides or mechanical cultivation are needed. Delaying these field checks can lead to larger weeds that are harder to control and missed herbicide application windows. Later scouting, when the crop reaches waist height, can help fine-tune future herbicide programs for future seasons.

Integrated Pest Management (IPM): herbicides should not be the only method of weed control. Implementing cultural practices can give corn a competitive edge against weeds. Select vigorous varieties, use 30-inch row spacing, and target a density of 30,000 to 34,000 plants per acre. Mechanical control through cultivation can effectively manage weeds between corn rows, but herbicides may still be necessary for weeds within the rows. No-till or reduced-tillage practices can also help decrease weed populations by reducing weed seeds germination rates.

Chemical Control Options: there are two main categories of herbicides: pre-emergent and post-emergent.

- **Pre-emergent Herbicides:** applied to the soil before weed competition begins. Options include EPTC, alachlor, and metolachlor, which can be applied broadcast and incorporated or banded and cultivated after bed formation.
- **Post-emergent Herbicides:** common choices in California include 2,4-D, bromoxynil, carfentrazone, and dicamba. Always follow herbicide labels to avoid phytotoxicity, ensure proper application rates, and protect human health and the environment.

Roundup Ready Corn and herbicide resistant weeds

Since the introduction of Roundup Ready corn in 1998, glyphosate has been a popular tool for weed control, offering flexibility against tough weeds. However, its extensive use has led to the development of herbicide-resistant weeds, including ryegrass, horseweed, and hairy fleabane. Other species, such as lambsquarters and pigweed, are becoming increasingly difficult to control. To mitigate resistance issues, it's important to integrate IPM techniques alongside Roundup Ready technology. Keep in mind that glyphosate can be applied over the top until corn is in the V8 stage of development (Fig. 6).

By employing a comprehensive approach that includes scouting, cultural practices, and strategic herbicide use, corn growers can effectively manage weeds while protecting their crops and the environment.

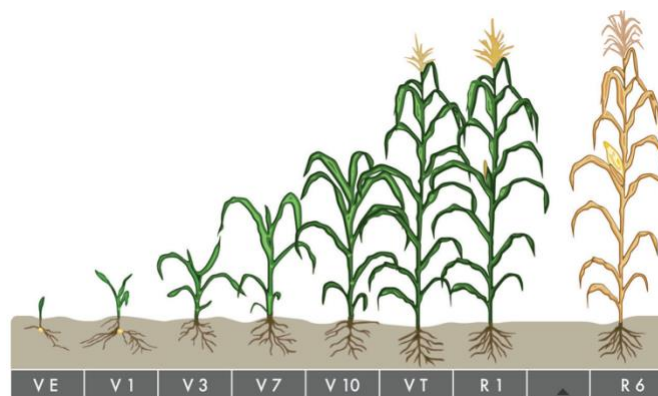


Figure 6: Corn growth stages from emergence (VE) to maturity. Image credit Bayer Crop Sciences