Palmer amaranth is native to the southwest US, but has recently moved into the Cornbelt. Compared to native pigweeds (Amaranthus species), Palmer amaranth poses unique management challenges. Therefore, preventing its spread into new areas is important.

Both waterhemp and Palmer amaranth are highly variable in appearance. While there are differences in vegetative characteristics, these traits are not completely reliable due to the diversity within both species. Because of this, it is important to become familiar with the floral characteristics of both species. Both weeds are dioecious, having separate male and female plants. This bulletin describes the characteristics of female plants, which are usually more distinctive than males.

Immature Palmer amaranth plants have certain traits that may allow them to be differentiated from waterhemp. Characteristics to look for include petioles that are longer than the leaf blade and watermarks on leaves (this trait hasn’t been observed in current Iowa infestations). Palmer amaranth tends to have rounder leaves than waterhemp, and the canopy is denser. The dense canopy contributes to the greater competitiveness of Palmer amaranth, making it much more damaging to crop yields than waterhemp.

Because of the variability in vegetative growth, the flowers are the most reliable means of confirming Palmer amaranth infestations. Bracts are modified leaves associated with flowers, and are the key to differentiating Palmer and waterhemp.

Female Palmer amaranth flowers (A) have a long (up to ¼”) bract that extends beyond the five tepals and seed capsule. The seed capsule is found within the tepals. The bracts become sharp at maturity, making female plants painful to handle.

Female waterhemp flowers (B) have a small bract that does not extend beyond the single tepal or seed capsule. Male plants have a short bract with five tepals.

Redroot and smooth pigweed have large bracts, but these species have hairy stems compared to the smooth stems of Palmer amaranth and waterhemp.

While the flowers of Palmer amaranth are much larger than those of waterhemp, the seeds of Palmer amaranth are only slightly larger than waterhemp seeds.

The inflorescences of both species are highly variable, with much overlap in appearance of individual plants.

Palmer amaranth (A) generally have long terminal branches greater than a half inch in diameter.

Most waterhemp (B) have slender branches less than six inches in length; however, some plants produce long branches more than a half inch in diameter.