

## **Palmer Amaranth Whitepaper** – Source: Purdue Extension Palmer Amaranth Biology, Identification and Management

### **History**

- Native of SW U.S. and Mexico
- Believed to have moved to SE U.S. as a contaminant in livestock feed
- Recently has been found in Michigan, Indiana, Iowa, and Ohio. The newest infestations appear to be connected to conservation plantings (cover crops, native seed/pollinator friendly plantings).
- Has developed resistance to both ALS herbicides and glyphosate.
- Has not been found in Wyoming yet, but is across the border in Nebraska, and is considered likely in the near future.

### **Biology**

- It is adaptable and invasive.
- It is dioecious (male and female plants), which allows it to adapt quickly. This is proven by its ability to develop herbicide resistance as well as its ability to survive in many environments.
- It is a prolific seed producer. A single plant will produce between 250,000 and 500,000 seeds.
- It thrives in minimum till or no-till, as the small seed's ideal emergence zone is the top 1".
- It is an aggressive competitor.
  - Growth of 2 to 3 inches per day is possible, and can grow to more than 6 feet tall.
  - Yield losses in corn up to 91 percent and 79 percent in soybeans
- It is resistant to multiple herbicide modes of action.
  - ALS inhibitors
  - HPPD inhibitors
  - Dinitroanilines
  - Glyphosate
- It emerges over extended periods of time, including after crop harvest.
- Seedlings are similar to redroot pigweed.
- Seed of Palmer amaranth and redroot pigweed are indistinguishable in seed tests.

### **Plant Identification**

- Redroot pigweed will have hairs on the stems and leaf surfaces. Palmer Amaranth does not.
- The petiole of Palmer amaranth is longer than the leaf. Seedlings will have a noticeably extended petiole on the first true leaves.
- Female seed head structures of Palmer amaranth can reach up to 3 feet long, and have stiff, sharp bracts that are prickly when touched.
- Palmer amaranth commonly has a single hair in the leaf tip notch, but not always.

### **Management**

- Rotate with crops that have herbicide options other than those to which Palmer amaranth is currently resistant.
  - Some herbicides currently used on crops in northern Wyoming that will control Palmer amaranth include Dual II Magnum, Outlook, Banvel, Prowl, and Valor.
- Deep tillage to bury seeds below the germination zone.
- Hand weed as necessary.
- Monitor field edges, ditches and control as found.
- Harvest infested fields/areas last, and clean equipment in an area where Palmer amaranth can be controlled.

### **Current and Potential Wyoming Impacts**

- Wyoming-grown alfalfa seed is commonly sold in areas that are becoming sensitive to Palmer amaranth. Seed of amaranth species cannot be distinguished in seed tests, so redroot pigweed contamination of seed lots is an issue
  - Seed labs have been directed to consider seed source when amaranth species seeds are found in a purity test.
    - If the seed lot was produced in an area where Palmer amaranth is known to occur, the test will show that amaranth species were found.
    - If the seed lot was produced in an area where Palmer amaranth is not known to occur, the seed test will show pigweed.
  - Should a regulatory sample be pulled, and amaranth species seeds found, it will likely be the discretion of the involved agency to determine the marketability of the seed lot.
  - Growers will be best served by aggressively controlling redroot pigweed in the field.
- Small seeded legumes, such as vetch and red clover, that are marketed to the Midwest and Northeast will have the same issues as the alfalfa industry.

### **How to Keep Palmer Amaranth from Becoming a Problem in Wyoming**

- Scout fields for Palmer amaranth. If it is found, communicate with others regarding the presence of the weed, and be very aggressive in control efforts.
- Custom harvest operations have been identified as one method of spread. If you use a custom harvester, inspect the equipment to make sure it is clean before it is allowed in your fields.
- Rotate crops and herbicides to control not only this weed, but avoid developing resistance in other weed species.
- If you plant a cover crop, consider using locally grown seed. Small-seeded cover crop components grown in areas that have Palmer amaranth will have a chance to be contaminated.