



An Impending Disaster for Arizona Cotton? Glyphosate Resistant Palmer Amaranth

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A probable case of glyphosate (Roundup) resistant Palmer Amaranth, *Amaranthus Palmeri*, (i.e., carelesslyweed or pigweed) has been discovered in an Arizona cotton field where glyphosate was the only herbicide used. Seed collection and testing is underway to confirm this conclusion.

Palmer Amaranth plants are either male or female and resistance genes can be spread by both pollen and seed. Studies show Palmer Amaranth pollen can move at least 164 feet in gentle breezes, longer distances with winds or “dust-devils”. One female plant can produce over a million seeds.

Cotton farmers should adopt a **zero tolerance** attitude towards Palmer Amaranth to avoid dire consequences. **Sanitation** or the physical removal of suspected resistant plants will stop pollen release and seed production and may slow the spread of Palmer Amaranth. Arizona’s isolated agricultural valleys may also help delay the spread of resistance for a significant period of time if all growers follow these practices.

1) In-field Sanitation

Hand remove any Palmer Amaranth escapes in the field or on the ends of fields — **do not allow pollen spread or seed production**. Plants with large diameter stems will re-sprout when cut; regrowth must be controlled.

Clean and remove all plant parts including seeds and soil from machinery before leaving infested fields — **do not transport seeds to other fields**. Harvest machines have the potential to spread resistant seed.

2) Farmstead Areas

Kill all Palmer Amaranth plants on the farm with “burn-down” herbicides (e.g., Aim, ET or paraquat), propane or mechanical means to stop pollen and seed production, especially along irrigation ditches, canals, fence lines, farm roads and equipment yards.

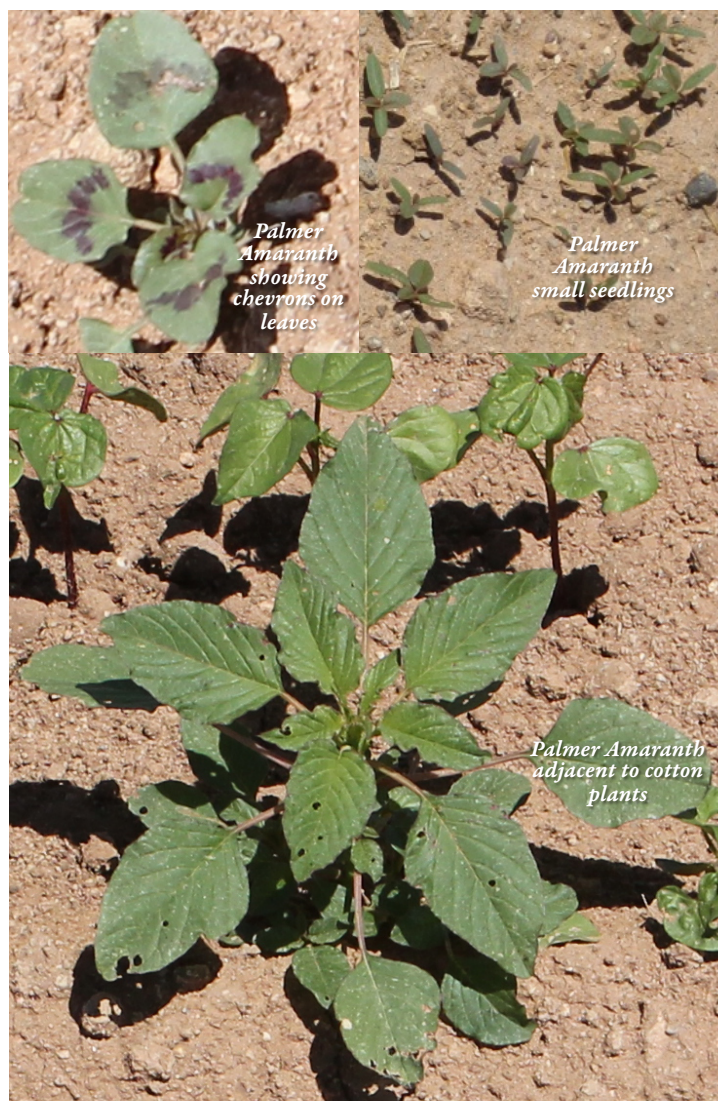
3) Community Action

Work with state and local governments, and neighbors to control Palmer Amaranth infestations on public roads, other public rights-of-way and in nearby residential enclaves.

Limiting the spread of glyphosate resistant Palmer Amaranth is a challenge, but **using a diversity of herbicide mechanisms of action and weed control practices can help in cotton**. Cotton growers with resistant Palmer Amaranth will face greater weed control costs: using herbicides and control techniques that require greater management input; using hand labor to remove escapes; and using more in-season tillage for weed control. Refer to the table (right) for Palmer Amaranth management strategies.

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Palmer Amaranth showing chevrons on leaves

Palmer Amaranth small seedlings

Palmer Amaranth adjacent to cotton plants

Growth Stage	Tool	Weed Control Practice
Preseason	Tillage	Start with a clean field
Preplant	PREE	Pendimethalin or trifluralin incorporated prior to listing
		Pendimethalin or trifluralin applied with a mulcher
1–4 leaf cotton	PREE	Prowl H ₂ O or metolochlor (e.g., Dual) as a broadcast spray & irrigated to incorporate
	POST – selective, over-the-top	Staple LX Liberty 280 can only be sprayed on Liberty Link or GylTol cotton varieties
>8” cotton to Layby	Post-direct, shielded or hooded sprayer	Prometryn, diuron, Layby Pro, Goal, GoalTender or Chateau (PREE & POST with surfactant)
		Aim or ET (POST only)
Seedling cotton to Layby	Cultivation	Destroy emerged plants; Precision GPS-RTK systems can cultivate close to the seed line, minimizing escapes
All growth stages	Hand weeding	Remove & destroy escapes before they release pollen or produce seed

