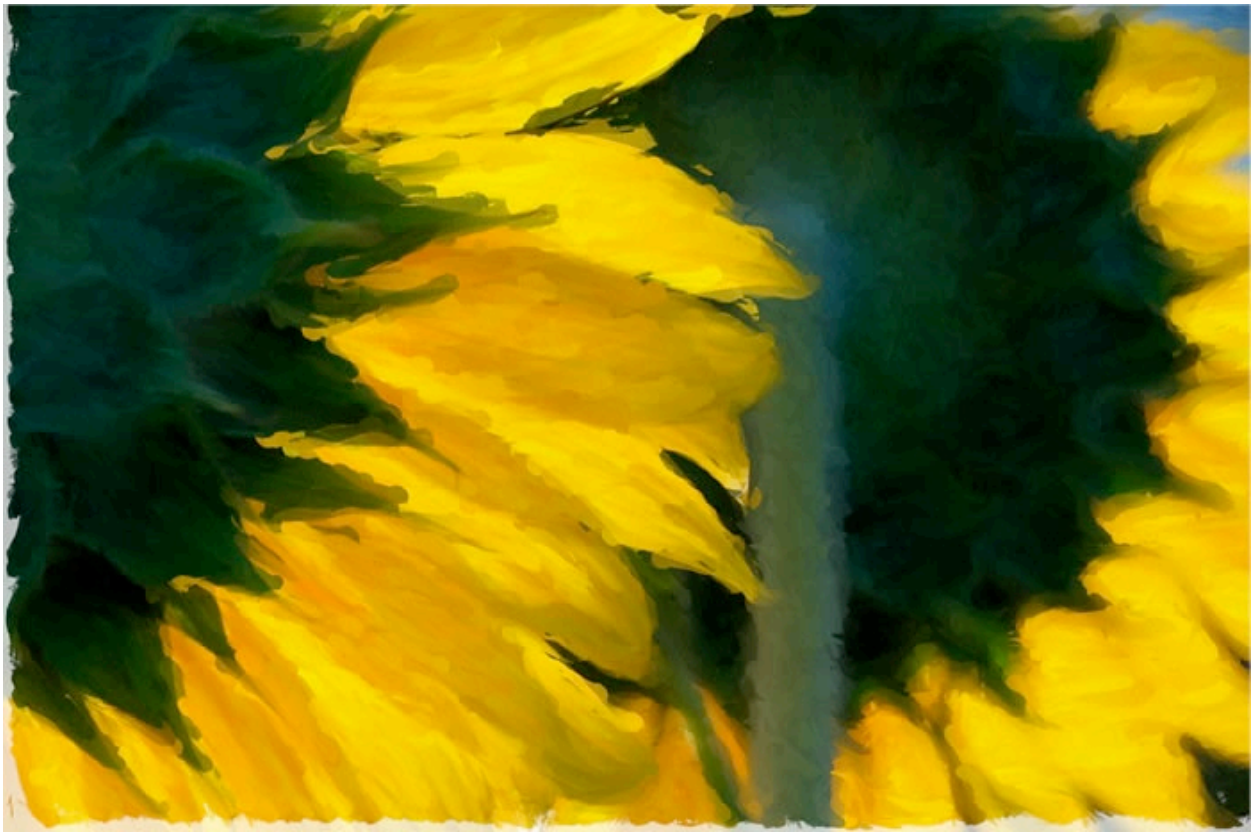
FOCUS on South Plains Agriculture

A newsletter from the Texas AgriLife Research and Extension Center at Lubbock



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http://lubbock.tamu.edu/focus

Weeds

Local Pigweed Resistant to Roundup

By Peter Dotray and Wayne Keeling

It is nearly impossible today to pick up a trade magazine or read a weed management article online without seeing some discussion on the development of herbicide -resistant weeds. To date, there are 365 resistant weed biotypes in over 460,000 fields worldwide. At least 21 weeds (13 in the US and an additional 8 worldwide) have been confirmed to be resistant to Roundup (http://www.weedscience.org/in.asp). Unfortunately, the Texas High Plains may no longer be immune to the Roundup-resistant weed problem. In recent years we have received phone calls about the possibility of weed resistance, but other issues such as herbicide rate, carrier volume, spray coverage, weed size, and overall harsh environmental conditions were noted as the likely cause. In 2011, the extreme heat, drought, low relative humidity, and relentless winds were likely major contributors to subpar product performance. We were alerted to a couple of fields in Terry County in early August where Palmar amaranth (a.k.a. pigweed or carelessweed) had survived multiple glyphosate applications at full labeled rates and even "spray to wet" backpack applications. Soil samples were collected from areas where weeds had recently been hoed, and these were potted in the greenhouse. Palmer amaranth plants that emerged from the field soil were sprayed with "field rates and excessive field rates" once they reached 2- to 3-inches in height and several survivors were observed. Preliminary greenhouse results indicated that glyphosate-resistant weeds were present in these fields. Additional greenhouse experiments are underway from these field sources and from additional fields that have been sampled where we suspect resistance issues.

One of the main reasons for the selection of herbicide-resistant weeds is the heavy and sometimes sole reliance on a single herbicide "mode of action" to control weeds over the course of the growing season and over several years. Growers on the Texas High Plains have done a good job using different modes-of-action, different weed management strategies to control weeds, and not relying on Roundup as the only means of weed control. Although the amount of cultivation has declined for understandable reasons, we still see plowing and cultivation as an effective strategy against the development of herbicide resistant weeds and simply breaking up weed cycles associated with High Plains crops. Interestingly, all of the fields we looked at this year where weed resistance is suspected were planted in cover crops under "minimum tillage". There are obvious benefits to minimum tillage, but these systems typically rely more heavily on herbicides (Roundup in this case).

We have spent a considerable amount of time talking about "prevention" strategies over the past several years. If we assume Roundup resistance is present in some of our fields in west Texas, how do "management" strategies differ from "prevention" strategies? We need to implement an aggressive weed resistance management strategy that includes the use of different herbicide "modes-of-action" over the course of the growing season. This includes the use of preplant

incorporated herbicides, preemergence herbicides at-planting, postemergence herbicides with residual weed activity, and herbicides applied layby. Ideally, the timing of additional herbicide inputs should overlap, so before one "plays out", the other is in place to control later-emerging weeds.

We see benefits of using other "mode-of-action" herbicides as an important part of successful weed management and as an effective weed-resistance strategy. One of the key herbicide timings with an alternative mode-of-action is the use of preplant herbicides. Effective preplant weed control will conserve soil moisture, allow planting operations to occur without the interference of weeds, and help to provide the critical early-season weed-free periods for the first six to eight weeks after crop emergence. One of the major challenges of using herbicides preplant is to ensure that herbicide activity in soil will not reduce crop germination and emergence. A second challenge is to select the proper herbicide(s) for the weeds that need to be controlled. Cultivation is an effective weed resistance tool as well.

What should growers be thinking about today, in late September? Producers should be proactive and closely monitoring fields, destroying suspicious weeds as soon as possible. This will limit the production of additional resistant seed and help prevent the problem from becoming more widespread next year. Producers also need to be aware that weed seeds can travel with equipment from one area of the field to another, and from field to field. If you have fields where you suspect resistant weeds may be present, do not transport equipment from a weedy field to a clean field without carefully cleaning the equipment. If you have custom harvester moving into one of your fields, make sure it has been cleaned first!

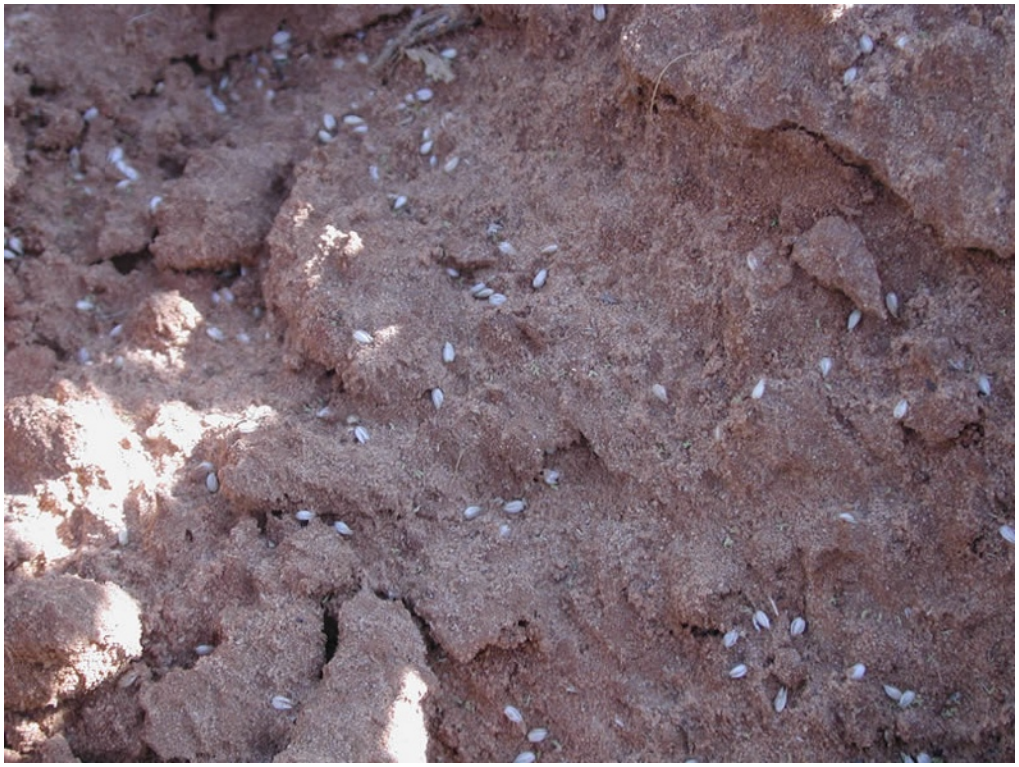
Roundup is still a very effective herbicide in our region, but weed resistance will certainly change our current weed management strategies. Start clean with tillage or preplant "knock down" herbicides. Use residual herbicides preplant, preemergence, and postemergence with alternative modes-of action. Control all weed escapes so seed are not produced and returned to the soil. Use good field hygiene practices to ensure weed are not transported from isolated spots in the field and from field to field.

photos follow on the next two pages

Mature Palmer amaranth that survived previous Roundup applications

Palmer amaranth that survived previous Roundup applications and hand hoeing

Healthy, potentially resistant Palmer amaranth alongside dead and injured plants



Female Palmer amaranth plants can produce up to 600,000 seeds that easily shatter to the ground

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Useful Web Links

Texas High Plains ET Network, Water Management Website, TAMU, Irrigation at Lubbock, IPM How-To Videos, Lubbock Center Homepage, Texas Agricultural Experiment Station Home , Texas Cooperative Extension Home, Plains Cotton Growers

County IPM Newsletters

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