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Palmer Amaranth is Still on the Move in Missouri

by Kevin Bradley

Palmer amaranth is a member of the pigweed family that is native to the southwest United States, but has slowly migrated into the Midwestern U.S. over the past decade or so. In the bootheel of Missouri, like western Tennessee, Arkansas, and a host of other southern states, Palmer amaranth has been the predominant pigweed species for several decades. It has only been in the past several years that we have begun finding Palmer amaranth in more northern geographies of Missouri outside of the bootheel. Over the years I have made an effort to track the spread of Palmer amaranth in these areas, and this information is shown in figure 1.

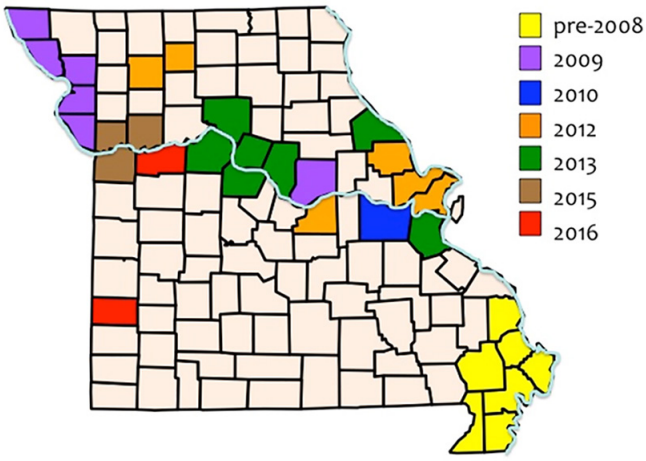

Figure 1. Distribution of Palmer amaranth from 2008-2016 in Missouri

I can't say for sure that these are the only counties where Palmer amaranth occurs in Missouri, but I can say for sure that these are the counties where I know it is present because I have identified it in that location myself. Each year it seems I add a few more counties to the list (figure 2), which is a big problem because Palmer amaranth is a much more competitive and aggressive species than waterhemp (our most common pigweed species throughout the rest of the state); one we don't want to have to contend with in the future. If you think you have Palmer amaranth in a county that is not colored in on this map, I'd be glad to receive a sample and/or photos so that we can keep this information as up to date as possible.

Palmer amaranth is fairly easy to distinguish from waterhemp and the other pigweeds once it gets past the seedling stage of growth (figure 3). Both waterhemp and palmer amaranth are hairless and have no hairs on their leaves or stems. However, palmer amaranth has much wider and distinctively diamond-shaped leaves when compared to waterhemp. Also, the leaves of palmer amaranth occur on petioles that are usually as long or longer then the leaves themselves. The leaves of Palmer amaranth have a poinsettia-like leaf arrangement when viewed from above and an occasional V-shaped variegation or watermark on the upper surface of the leaf. Mature palmer amaranth can often grow to more than seven feet in height. But perhaps the most distinguishing characteristic is the seedhead; Palmer amaranth will have seedheads very different from those of waterhemp (figure 4). The female seedheads have large spiny bracts that extend beyond all other flower parts and will be prickly to the touch unlike waterhemp. For more information on the identification of Palmer amaranth, see this publication: http://weedscience.missouri.edu/publications/50737_FINAL_FactSheet_PalmerAmaranth_poster_v2.pdf.

(continued on pg. 2)

In This Issue

Many farmers ask me how this weed has found its way into other areas of the state in recent years. There are a lot of possibilities, and I won't try to tackle them all here but I will mention a few of the ways that we know Palmer amaranth has spread in Missouri. First, Palmer amaranth has been introduced into fields through the purchase of used equipment (usually combines) and/or through custom harvesting crews that have come from other regions where Palmer amaranth is more prevalent.

Second, we have seen at least one case in Missouri where Palmer amaranth was introduced into an area as a result of contaminated hay that was purchased from Arkansas where Palmer amaranth is the predominant weed species in just about every cropping system, and can occur in hay fields as well. Similarly, Palmer amaranth can be introduced in an area through the purchase of contaminated animal feeds like cottonseed meal. While I haven't personally encountered this situation in Missouri, my colleagues in other states with bigger dairy industries like Indiana, Michigan, and Wisconsin have tracked the introduction of Palmer amaranth into their states in this manner.

Third, we know that waterfowl can transport and distribute viable Palmer amaranth seed over fairly long distances, and that Palmer amaranth can be introduced into fields in this manner. In fact, the initial distribution of Palmer amaranth along the river bottoms in Missouri (figure 1) led us to this hypothesis, and after several years of research we have found this method of dispersal to be a very real possibility. For more information on waterfowl and Palmer amaranth distribution, you can view a slideshow of our research results here: http://weedscience.missouri.edu/extension/pdf/waterfowl%20and%20weed%20seed.pdf.

Fourth, Palmer amaranth can be introduced into an area through contaminated seed. While I have not encountered this situation in Missouri yet, it is important to note that Iowa, Illinois, and Ohio have recently documented new infestations of Palmer amaranth in newly seeded CRP "Pollinator Habitat" fields and suspect that the problem is contaminated seed sources of native seed mixes. For more information about these cases you can visit the following links: http://bulletin.ipm.illinois.edu/?p=3700, http://agcrops.osu.edu/newsletter/corn-newsletter/status-palmer-amaranth-ohio, and http://crops.extension.iastate.edu/cropnews/2016/08/new-palmer-amaranth-findings-iowa.

In short, any seed, feed, or equipment coming onto your farm should be thoroughly examined for the presence or even the possibility of Palmer amaranth seed. This is not a species that Midwest farmers will want to contend with in the future. If you find newly introduced Palmer amaranth plants in your fields, rogue them out immediately so that the population does not establish itself and become a much bigger problem for you in the future.

Figure 2. Palmer amaranth infestation discovered in a double-crop soybean field in Barton County in 2016.

Figure 3. Palmer amaranth (left) and waterhemp (right) growing in the same field in central Missouri.

Figure 4. Waterhemp (left) and Palmer amaranth (right) seedheads are distinct and one of the most reliable ways to make an accurate identification.

Weather Data for the Week Ending August 28, 2016

Station	County	Weekly Temperature (°F)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	Aug 1 - 28	Departure from long term avg.	Accumulated Since Apr 1	Departure from long term avg.
Corning	Atchison	84	65	91	62	72	-3	4.94	+1.50	3095	+354
St. Joseph	Buchanan	83	65	87	61	73	-2	5.71	+1.82	2985	+259
Brunswick	Carroll	85	66	91	56	75	0	3.89	-0.19	3128	+362
Albany	Gentry	81	62	87	54	71	-4	7.40	+4.02	2708	+23
Auxvasse	Audrain	86	66	91	57	75	0	9.67	+6.32	2962	+163
Vandalia	Audrain	86	65	90	53	75	-1	4.53	+0.90	2956	+200
Columbia-Bradford Research and Extension Center	Boone	84	66	89	56	74	-2	5.52	+1.64	2906	+37
Columbia-Capen Park	Boone	88	65	95	53	75	-2	2.62	-1.22	2991	+23
Columbia-Jefferson Farm and Gardens	Boone	86	67	91	58	76	0	4.30	+0.42	3056	+179
Columbia-Sanborn Field	Boone	86	68	92	58	77	0	3.21	-0.68	3204	+231
Columbia-South Farms	Boone	85	67	90	59	76	0	4.37	+0.45	3015	+143
Williamsburg	Callaway	85	65	91	54	74	-1	8.15	+4.47	2858	+112
Novelty	Knox	82	64	88	55	73	-2	7.68	+4.48	2767	+63
Mosow Mills	Lincoln	85	66	90	54	76	0	5.88	+2.74	3027	+157
Linneus	Linn	82	65	89	57	73	-2	5.06	+1.53	2835	+169
Monroe City	Monroe	84	64	89	53	74	-1	5.39	+2.00	2924	+160
Versailles	Morgan	87	68	93	59	77	+1	4.43	+0.96	3164	+224
Green Ridge	Pettis	87	66	93	57	76	+2	6.23	+3.17	3040	+270
Unionville	Putnam	81	64	87	56	72	-1	9.67	+4.94	2677	+179
Lamar	Barton	88	66	92	56	77	-1	1.75	-1.15	3190	+131
Butler	Bates	87	67	90	59	76	-2	4.84	+1.21	3127	+20
Cook Station	Crawford	88	65	91	51	76	-1	4.13	+0.85	2955	+11
Round Spring	Shannon	87	65	91	55	75	0	6.13	+3.02	2900	+80
Mountain Grove	Wright	86	66	90	53	75	-1	4.24	+1.63	2860	+74
Delta	Cape Girardeau	90	67	94	58	77	-1	11.35	+8.62	3190	-51
Cardwell	Dunklin	90	69	94	61	79	0	6.43	+4.44	3518	+10
Clarkton	Dunklin	91	69	95	60	78	-1	6.04	+4.04	3471	+16
Glennonville	Dunklin	90	70	93	61	79	0	4.88	+2.84	3467	+27
Charleston	Mississippi	90	69	94	60	79	+1	7.31	+5.05	3455	+185
Hayward	Pemiscot	89	69	92	60	78	-1	5.40	+3.33	3398	-59
Portageville	Pemiscot	90	70	94	62	79	0	4.35	+2.33	3605	+123
Steele	Pemiscot	91	69	95	60	79	0	2.58	+0.37	3554	+67

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

Weather Data provided by Pat Guinan | GuinanP@missouri.edu | (573) 882-5908

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