Integrated Pest & Crop Management

Weed of the Month: Bush honeysuckle—an ornamental gone wrong

by Mandy Bish and Kevin Bradley

Figure 1: Bush honeysuckle growing in the understory of a forested area.

Figure 2: The leaves attach to the stem opposite of each other and are usually dark grown on the upper surface.

Bush honeysuckle, also referred to as Amur honeysuckle (*Lonicera maackii*), was introduced into the U.S. as an ornamental for city landscapes in 1897. The plant was promoted for soil stabilization and reclamation programs in the 1960's. Bush honeysuckle is a relative to the native and non-invasive honeysuckles of the U.S.; however, its ability to easily establish and grow in many environments such as lake and stream banks, floodplains, meadows, prairies, and forests (Figure 1) warrants concern. Bush honeysuckle is rapidly spreading through forests in the northern U.S.[1] where it is displacing native annuals and perennial herbs and disrupting species diversity[1]. This invasive plant can be found from the east coast to Texas, Kansas, Nebraska, and North Dakota and has been introduced in Oregon; it is listed as a noxious weed in Connecticut, Massachusetts, and Vermont[2]. The plant's invasive ability may in part be due to allelopathic effects on surrounding plants, a rapid growth rate relative to desirable plants, and the ability to tolerate moderate shade and outcompete neighboring plants for the available sunlight. Recent work by researchers in Ohio has shown that bush honeysuckle can also outcompete neighboring plants for water with its fine root system. The scientists found that the majority of bush honeysuckle's roots are located within the top 5 inches of the soil[1].

Bush honeysuckle seedlings emerge in the spring; the cotyledons are ovate to oblong and have an indentation at the apex. This deciduous shrub grows upright and can reach heights over 6 feet. The plants' stems and branches are usually hollow, which is a characteristic that can help distinguish bush honeysuckle from the native, non-invasive honeysuckles, which have solid stems. Leaves are attached opposite to each other along the branch and can grow up to 3 and 1/2 inches long and 1 and 1/2 inches wide. Each leaf blade tapers to an elongated tip (Figure 2). The upper leaf surface is usually dark green and has none to few hairs; the lower leaf surface is a lighter green and has hairs along the leaf veins.

Continued on page 2 ▶

In This Issue

Unlike the native honeysuckles, which produce yellow flowers, bush honeysuckle produces white flowers from May into June. These flowers are fragrant and turn to a creamy yellow color as they age. Bush honeysuckle flowers occur in pairs at the junction of the stem where the leaves branch out. Flowers are approximately ¾ to 1 inch long and have 2 lips (Figure 3). The five petals of each flower are fused together to form the honeysuckle tube. In early fall, bush honeysuckle plants begin producing distinct, bright red berries that are approximately ¼ inch in diameter and contain 2 to 3 seeds each (Figure 4). Birds and white-tailed deer have been shown to eat the berries and aid in the spread of the weed[3]. In mid to late fall, the plant's leaves will turn yellow (Figure 5) and then drop off, leaving bare shrubs that can provide effective camouflage for deer during November.

Identification of bush honeysuckle seedlings and hand pulling the young plants in early spring can be effective in preventing or minimizing infestations of the weedy shrub. Controlled burning in the spring can kill seedlings and the new growth of established plants. However, bush honeysuckle can readily resprout, therefore one burning will not control mature plants. Research indicates that mowing is only marginally effective at reducing infestations given the plant's ability to sprout from the crowns following the cutting.

Two of the most effective chemical options for bush honeysuckle control are triclopyr (Remedy Ultra, Pasture Guard) and glyphosate (Roundup, Touchdown). University of Missouri research has shown that foliar applications of these herbicides are generally more effective than either cut-stump or basal bark applications. For foliar sprays, apply a 2 percent solution of the active ingredient in water with a nonionic surfactant in early spring or in the fall prior to the leaves changing color. It is important to note that glyphosate is a non-selective herbicide and will kill or injure non-target plants, such as legumes and grasses, which it contacts. Applications may be easiest in the fall, when surrounding non-target plants have already gone to dormancy and while the bush honeysuckle leaves are still green. For a cut-stump application, apply a 20 percent glyphosate solution with a sprayer or brush, thoroughly coating the freshly cut stump. Always check the herbicide label for instructions and confirmation of herbicide use rates.

Figure 3: Bush honeysuckle produces pairs of white flowers where the leaves branch off the stem.

Figure 4: The distinct, red berries are produced in the fall and attract birds and other animals.

Figure 5: Bush honeysuckle leaves turn yellow in mid- to late-fall, then drop as winter approaches.

To read more about bush honeysuckle or check out other common Missouri weeds, visit our Web site: weedid.missouri.edu

For more information on the control of weeds in forages, pastures, and noncrop areas, order a copy of the latest version of IPM1031: http://extension.missouri.edu/p/ipm1031

To see a 2010 county-by-county map of bush honeysuckle presence in the state visit: http://plantsci.missouri.edu/deltaweeds/pdf/mdc/Bush_Honeysuckle.pdf

[1] *Pfeiffer SS and DL Gorchov (2015) The American Midland Naturalist 173(1): 38-46.*

[2] *USDA-NRCS Plants Database: plants.usda.gov*

[3] *Castellano SM and DL Gorchov (2013) Natural Areas Journal 33(1): 78-80.*

[4] *Smith K and A Smith (2010) Controlling Non-Native Invasive Plants in Ohio Forests: Bush Honeysuckle: http://ohioline.osu.edu/for-fact/pdf/0068.pdf*

Are you ready for the weeds?

Prevented plant acreage from this season will most likely mean high weed pressure in 2016.

by Mandy Bish and Kevin Bradley

Benjamin Franklin once said, "By failing to prepare, you are preparing to fail." I think that statement is appropriate for where we are with weed management right now in Missouri—if we don't plan accordingly, the problems experienced this year could lead to even greater problems next year. This year more than 1.5 million acres of cropland were never planted as a result of the continually wet conditions experienced from April through July. Most of this acreage was left fallow without any sort of weed management program and these fields grew up into a weedy mess. These weeds have matured and produced viable seed that, in most cases, have already been deposited back into the soil seedbank. The primary weed I have seen in most of these fields is waterhemp, which produces about 300,000 to 500,000 seed per plant. I have also seen plenty of fields infested with marestail (a.k.a. horseweed, Conyza canadensis), ragweed species, and grasses like giant foxtail and fall panicum—all of which are also capable of high seed production. In short, the number of weed seed sitting in the soil seedbank waiting to germinate and wreak havoc next year may be unlike anything we've ever experienced before. And as Mr. Franklin put it, we must have a plan or we might suffer the consequences.

Marestail/horseweed was especially difficult to control this past spring in Missouri soybean fields. Fall herbicide applications are one component of an effective strategy to manage this weed.

So where do you start? How can you be ready to tackle the potential problems that exist in your fields right now? In this article, I suggest a stepwise approach for selecting your soybean herbicide program for the 2016 season. But remember that herbicides shouldn't be the only component of your weed management program – we have to think beyond herbicides for weed management, and this includes cultural control methods like narrow row spacings, optimum planting populations, crop rotation, cover crops, and tillage where appropriate. These cultural control practices need to be combined with an effective herbicide program to achieve the best weed control possible.

First, consider whether your management system and predominant weed species would benefit from a fall herbicide application. Fall herbicide applications aren't the answer to all our weed problems but they are an effective tool for winter annual weeds and especially for marestail. If marestail is one of your "driver weeds", a fall herbicide application can save you from having much bigger problems next spring. Some of the more effective fall residual herbicides for the control of marestail in soybean include Autumn Super and any of the chlorimuron-containing products like Canopy, Canopy EX, Cloak, Cloak EX, Valor XLT, Authority XL, and others. These herbicides should be combined with a base program of glyphosate plus 2,4-D and/or dicamba to control any seedlings and rosettes present at the time of application. Another option is to leave the residual out of the fall application and wait to apply a full rate of a residual herbicide in the spring. Both approaches can be effective and there are many of factors (especially herbicide cost) to consider.

Second, plan to start weed-free next season with an effective tillage operation or burndown herbicide application. We cannot afford to plant into weeds that have not been adequately controlled or that are already emerged at the time of planting. This will put you behind the eight ball before you even begin, and it's likely you will never catch up. Another reason to start weed-free is that there are too many resistant weed species that will not be controlled in-crop if they have emerged by the time of planting. We now have multiple herbicide resistances within numerous populations of marestail, giant ragweed, and especially waterhemp. This essentially means that there are little to no post-emergence herbicide options for the control of these weeds in Roundup Ready soybean.

Third, make sure to apply a full use rate of a pre-emergence, residual herbicide that targets your most problematic weed species. For most Missouri producers, this means you need an

Continued on page 4 ▶

effective herbicide for waterhemp. For waterhemp, some of the most effective pre-emergence residual herbicides include the group 14 herbicides such as those that contain flumioxazin and sulfentrazone (Authority products, Envive, Fierce products, Sonic, Valor products, etc.) and the group 15 herbicides such as those that contain metolachlor (Dual II Magnum, in Boundary, in Prefix, etc.), dimethenamid (Outlook, OpTill PRO), pyroxasulfone (Zidua, in Fierce, etc.), and acetochlor (Warrant, in Warrant Ultra). Trifluralin (Treflan, group 3) and metribuzin (Sencor, Tricor, etc., group 5) can also provide good waterhemp control. A key point here is that you should apply a full use rate of whichever product you have chosen. Unfortunately, some pre-emergence herbicides still have a section on their label that contains information about reduced rates for use in Roundup Ready soybean systems. Usually this reduced rate is half that of the full use rate listed in a different section of the label. This makes no sense to me and is likely going to drive us towards more resistance problems in the future. If you have glyphosate-resistant waterhemp in your fields and know that glyphosate isn't going to control this weed no matter what rate you use, what's the rationale for applying a lower rate of a pre-emergence residual product that actually does control waterhemp? The bottom line is this – you need to make sure you do the best job you can up front with pre-emergence herbicides, if for no other reason than our inability to successfully control waterhemp post-emergence across in the majority of fields throughout the state.

Fourth, scout fields regularly after emergence and make timely applications of post-emergence herbicides to weed escapes. Simply put, there was a time when many farmers forgot about the importance of weed size because glyphosate controlled the weeds no matter the size. Now glyphosate does not control most of our driver weeds (waterhemp, marestail, giant ragweed, etc.) and I think everyone is in the process of "re-learning" that lesson. Group 14 (or PPO) herbicides like Cobra, Flexstar, Marvel, Phoenix, Ultra Blazer, and others just simply will not provide adequate control of waterhemp that is greater than 4 inches in height at the time of application. The same is true of glufosinate (Liberty, group 10) in Liberty Link soybean. If you apply one of these herbicides to waterhemp that is greater than 4 inches in height and aren't happy with the outcome, it isn't necessarily because the weed is resistant; the products aren't labeled for waterhemp that size in the first place. Another thing to think about when it comes to post-emergence applications of the group 14 herbicides and also Liberty is that coverage is critical, and that the spray application parameters that may be ideal for glyphosate aren't usually the best for these contact herbicides. So higher gallonage per acre and nozzles that provide good coverage will be critical.

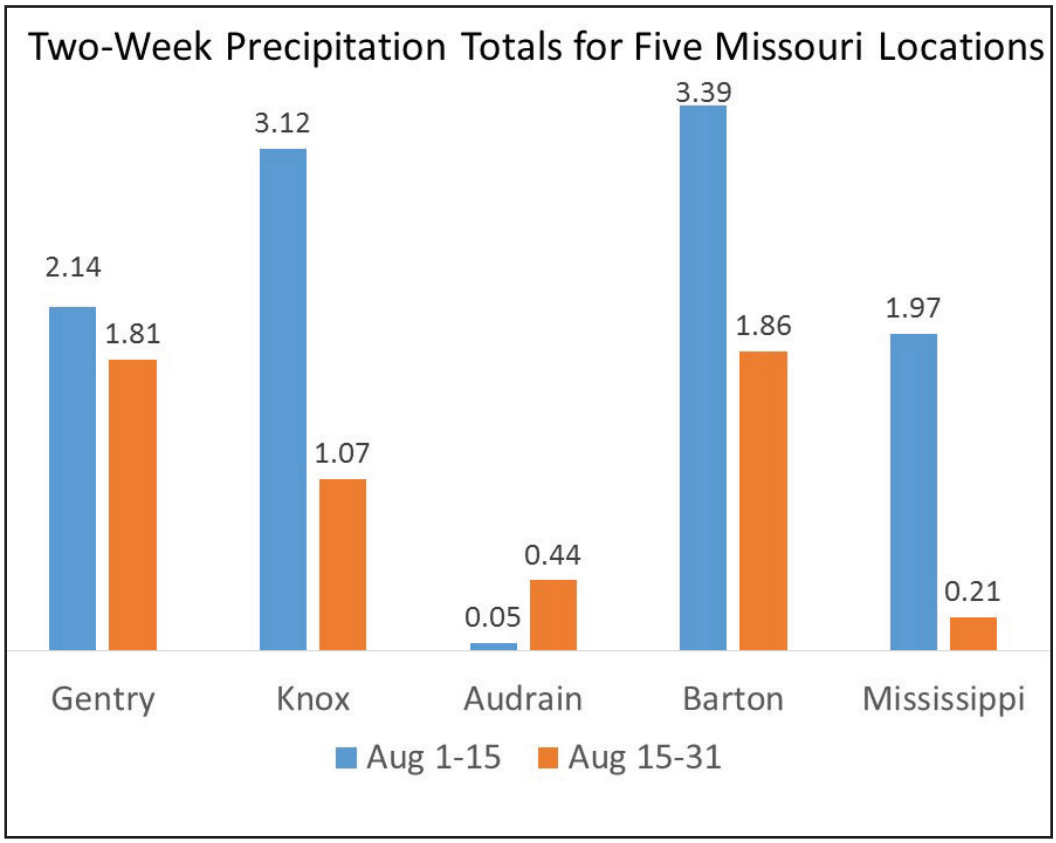
Fallow fields like this were a common site across Missouri in 2015 due to the unusually wet conditions experienced throughout the season. Many of the weeds in these fields produced viable seed that were deposited back into the soil for farmers to contend with next season.

Fifth, "layered" or "overlapping residual" herbicide programs are insurance against late-season flushes of certain and have proven to be an effective strategy for the management of waterhemp. If you aren't familiar with this type of weed management strategy, it involves a pre-emergence residual herbicide before planting, followed by an in-crop application of another residual herbicide (Anthem, Cinch, Dual II Magnum, Outlook, Prefix, Warrant, Zidua, etc.), usually made at the same time as a glyphosate application in Roundup Ready soybean, or Liberty application in LibertyLink soybean. This herbicide strategy won't work on every weed species, but it does provide effective residual control of waterhemp and a variety of other small-seeded broadleaf weeds and grasses. More Missouri growers have adopted this herbicide program in recent years as a result of its effectiveness on waterhemp.

As mentioned previously, the most important thing is for you to have a plan. If you follow the 5 steps above, I believe you will be able to offset many of the consequences of this past season. For more information on this topic or other weed-related issues facing Missouri producers, visit us on the web at www.weedscience.missouri.edu or follow us on Facebook and Twitter at Mizzou Weed Science.

Dry Weather in August May Decrease Yield Potential of Missouri Crops

by Bill Wiebold



Wet spring weather is the gift that keeps on giving. Wet weather during and after planting increases the possibilities of soil compaction and root diseases. These lead to smaller and less healthy root systems on corn and soybean plants. Smaller root systems means that plants are more vulnerable to dry weather during grain-fill. A scenario that is most detrimental to grain-crop yield is a wet spring followed by dry weather during grain filling. Weather conditions that include bright sun, warm temperatures, low relative humidity, and wind increases water demand by plants. If roots are small or unhealthy they cannot supply enough water and plants become stressed. Stress during grain filling reduces yield.

Normally, July weather affects corn yield and early to mid-August weather affects soybean yield. But, with delayed planting in 2015 the most influential periods have shifted two to four weeks later than normal. So, precipitation amounts throughout August will influence corn and soybean yields this year.

The following graph presents precipitation amounts for August in five counties distributed among corn and soybean production areas of Missouri. For good to excellent grain yields, about 1.2 inches of rain are required each week during grain-fill. Only two location received more than 2.4 inches in early August. None of these five locations received adequate precipitation in the last half of August. Northeast Missouri, including Audrain County, has been especially dry. This region is more vulnerable to drought stress because soils in a large portion of the region contain a clay-pan that restricts water drainage in spring and reduces root depth throughout the growing season.

We had hoped that the unusually wet spring this year would be followed by above average precipitation in August. Unfortunately, that is not the scenario that has occurred in much of Missouri in 2015. Delayed planting reduces yield potential, but the amount of lost yield can be greatly reduced if Mother Nature cooperates. However, less than average August rainfall occurred in parts of Missouri. Drought stress symptoms on plants are common in Missouri fields, especially where soil holds less plant available water because soil texture (too much clay or sand) of compaction. Rain that falls this week will help, but yield potential has probably decreased because of dry August weather.

Weather Data for the Week Ending September 29, 2015

Station	County	Weekly Temperature (ºF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	September 1-29	Departure from long term avg.	Accumulated Since Apr 1	Departure from long term avg.
Corning	Atchison	82	61	87	51	71	+10	4.04	+0.89	3558	+267
St. Joseph	Buchanan	80	60	84	55	70	+8	1.86	-2.16	3474	+197
Brunswick	Carroll	83	58	87	55	70	+9	0.73	-2.52	3724	+406
Albany	Gentry	80	58	84	49	68	+8	3.90	+0.66	3251	+36
Auxvasse	Audrain	83	58	87	54	69	+7	0.88	-2.95	3551	+183
Vandalia	Audrain	82	58	86	53	69	+7	0.43	-3.27	3529	+208
Columbia-Bradford Research and Extension Center	Boone	81	59	84	57	68	+6	0.83	-2.91	3503	+47
Columbia-Capen Park	Boone	86	56	89	51	68	+5	0.82	-2.88	3523	-50
Columbia-Jefferson Farm and Gardens	Boone	83	60	86	57	70	+8	1.12	-2.54	3626	+159
Columbia-Sanborn Field	Boone	82	61	85	58	71	+8	0.60	-3.16	3797	+217
Columbia-South Farms	Boone	82	60	84	57	70	+8	1.09	-2.66	3582	+121
Williamsburg	Callaway	85	56	87	50	68	+6	0.75	-3.42	3542	+231
Novelty	Knox	80	56	84	53	67	+6	1.38	-2.18	3305	+57
Mosow Mills	Lincoln	82	57	86	52	68	+6	2.55	-1.01	*	*
Linneus	Linn	81	59	87	56	69	+8	1.30	-2.07	3399	+196
Monroe City	Monroe	81	56	85	53	68	+8	1.58	-2.15	3456	+153
Versailles	Morgan	84	59	87	54	70	+7	1.40	-2.61	3758	+219
Green Ridge	Pettis	84	59	86	53	70	+8	1.12	-3.35	3598	+259
Unionville	Putnam	77	58	83	51	67	+7	4.50	+0.30	*	*
Lamar	Barton	83	58	85	54	70	+7	1.45	-3.41	3774	+80
Butler	Bates	82	60	85	58	70	+6	6.68	+1.99	*	*
Cook Station	Crawford	81	54	85	47	66	+4	0.35	-3.80	3499	-28
Round Spring	Shannon	80	56	84	50	65	+3	0.80	-3.04	3432	+39
Mountain Grove	Wright	80	57	83	50	67	+5	1.29	-3.15	3398	+30
Delta	Cape Girardeau	80	58	86	50	68	+3	1.29	-2.03	3757	-141
Cardwell	Dunklin	83	59	91	53	70	+3	0.92	-2.04	4125	-96
Clarkton	Dunklin	83	59	89	53	70	+3	0.39	-2.81	4106	-56
Glennonville	Dunklin	82	59	88	53	70	+4	0.73	-2.40	4144	+10
Charleston	Mississippi	82	61	87	55	71	+6	1.26	-1.88	4095	+157
Hayward	Pemiscot	80	60	86	53	69	+2	0.75	-2.59	4268	+108
Portageville	Pemiscot	82	62	88	56	71	+4	0.39	-2.89	4325	+135
Steele	Pemiscot	82	60	89	50	70	+3	0.37	-2.72	4204	+7

‡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

Insect Pest & Crop Management newsletter is published by the MU IPM Program of the Division of Plant Sciences Extension. Current and back issues are available on the Web at **http://ipm.missouri.edu/ipcm/**. Mention of any trademark, proprietary product or vendor is not intended as an endorsement by University of Missouri Extension; other products or vendors may also be suitable.

Editor: Amy Hess (hessa@missouri.edu)