KMAland Magazine 2017

PRSRT STD
ECR-WSH
U.S. Postage Paid
Permit NO. 56
Red Oak, IA 51566

LOCAL-RURAL POSTAL PATRON

KMA LAND
960 AM & 99.1 FM

Thank you for taking a look at the 2017 KMA Ag Mag, as usual it is full of useful information that will connect you with experts in all fields of agriculture.

I have, for the most part, fond memories of growing up as a kid in the 70s. From an amazing variety of music to Evel Knievel to a great decade of sports excellence to Farrah Fawcett, the list goes on and on as to the awesomeness of the decade.

One thing I don't particularly remember with much fondness is being smack-dab in the crosshairs of the time pendulum when it came to the termination of weeds, aka, walking beans. Don't get me wrong, it was great exercise, I got to bond with my family and friends while wielding the precision weed-killing instrument known as the bean hook, but it was also extremely challenging when at times the button weeds and cockle burrs were thick as prairie and the sunflowers stems seemed as thick as sequoia trunks. I remember wearing trash bags in the early mornings when the soybeans were up to our waist and there was seemingly 10 gallons of dew on each plant but to no avail, we were always soaking wet 10 yards into the row.

With all this being said would I change a thing about my childhood and teenage years, including the walking beans part? No way. I knew I was doing something good for my dad and brothers and I also remember the satisfaction of peering at a bean field that days before was a mess with weeds transformed into a field that was clean as a whistle.

But things certainly changed for the better for everyone involved. I remember when my brothers started using the Rope Wick and I was amazed when weeds could be killed from the driver's seat of the tractor simply by brushing the unwanted plants growing above the soybeans with chemical, killing the weeds but leaving the soybeans unscathed. It wasn't an exact science in terms of the occasional bouncing tractor and wick, but it sure was cool to see the results.

DEAN ADKINS
KMA AG SERVICES DIRECTOR

What I noticed at the time that this was the beginning of the end of multiple crews scattered across the farm landscape walking beans in the summertime. For the most part, technology was phasing out the bean walker. And, as you know, it was just the beginning.

Along came glyphosate, which could be applied directly to bean fields and other crops, wiping out the dreaded weeds while not negatively affecting the desired plants, leaving no competition for the desired crops to grow and thrive. It seemingly transitioned in no time from summers where you saw weeds in bean fields to summers where there wasn't a weed in sight, anywhere, it was jaw-dropping amazing.

But was this sustainable? Could farmers keep on doing it this way, in this blissful state, forever? Of course the answer was, no. There was a warning for eventual weed resistance even at the time, with refuge acres emphasized to provide a balance between weed termination and resistance that could be sustained for as long as possible.

In time, however, the new herbicide-resistant villains began to appear on the horizon. Horse Weed or Mares tail, Giant Ragweed, Common Water hemp and the latest version of Darth Vader, the dreaded Palmer Amaranth arrived on the scene and refused to die while other weeds continued to wither.

Producers grew to understand that other newly-introduced chemicals, applied both pre and post-emergence, would need to be used in conjunction with glyphosate to provide some balance to head those nasty weeds off at the pass.

In the pages ahead of this year's Ag Mag, you'll hear from the experts in the field who are using the latest in technology to combat unwanted plants, with the understanding that even though knowledge is power, it will still, just like back in the 70s, ultimately be up to the producer and landowner to perform the do-diligence needed to control and ultimately, attempt to wipe out the next generation of yield zappers known as weeds.

KMA LAND
960 AM & 99.1 FM

KMALAND MAGAZINE 2017

We hope you enjoy this years edition and find it informative - let us know! Drop us a note or come to the studios at 209 North Elm, Shenandoah, IA 51601 or e-mail me at shansen@KMAland.com.

~Sandy Hansen

Sales Manager ..... Sandy Hansen
Station Manager ..... Don Hansen
Ag Services Director ..... Dean Adkins
Sports Director ..... Derek Martin
News Department ..... Chuck Morris | Mike Peterson | Ryan Matheny | Brent Barnett
Sports Department ..... Derek Martin | Bryan Clark
On Air Personalities ..... Tim Wayne
Account Executives ..... Jean Debban | Sandy Hansen | Kelly Johnson
..... Shari Lindburg | Spencer Williams
Creative Services ..... Spencer Williams
Traffic & Billing ..... Diane Wilson
Reception ..... Sandy Bierbaum
Engineering ..... Mark Brockmeyer

Herbicide resistant weeds in Kansas

Curtis Thompson, January 2017
Professor, Extension and Research, Weed Science, Agronomy Dept, Kansas State University

Kansas has approximately 22.4 million acres of prime agricultural land which is subject to weed management strategies in crop production. Primary crops grown in Kansas are Wheat, Corn, Soybeans and sorghum with additional acres planted to alfalfa/forage, cotton, and sunflower. As a result, herbicide diversity can be somewhat limited. Rotations of Wheat/sorghum/fallow, wheat/corn/fallow, continuous wheat, continuous corn, corn/soybeans are the most common rotations used in Kansas. Few farmers have more diverse rotations than just discussed.

Kansas has a long history of herbicide resistant weeds and problems with certain weed species that seem to be more prone to developing resistance. One of the more troublesome weeds in the western half of Kansas is kochia. Kochia was reported as resistant to atrazine in 1976 in Kansas and to the newly developed ALS inhibitors, chlorsulfuron in 1987. ALS resistance in kochia became wide spread very fast because ALS inhibitors were commonly used on wheat, in wheat stubble, and in corn and soybeans. Kochia resistant to glyphosate was first discovered in 2007 at two independent locations in Kansas. It quickly spread far and wide where kochia is a problem in crop production. More recently, 2013, kochia was discovered resistant to dicamba. This population was also resistant to glyphosate, ALS inhibitors, and triazines. Discussions with growers suggest that dicamba resistance is on the increase. Kochia remains a challenge to manage. Starting early before kochia germinate in late February or Early March with soil active herbicides that control germinating kochia is most valuable.

BIG FOUR

Kochia

Palmer amaranth

Waterhemp

Horseweed/ marestail

Palmer amaranth, a challenging pigweed, has been a problem in Kansas for many years and is becoming an increasing problem across many of our crop producing states. Palmer amaranth was first reported resistant to the soybean herbicide Pursuit in 1993 in Kansas. With ALS inhibitors used in corn, wheat, and sorghum, ALS resistant Palmer amaranth because wide spread quite quickly. Having male and female plants, resistance was spread by pollen and through

Continued to page 6

Continued from page 5

seed contaminated farm equipment. Palmer amaranth was found resistant to triazines in 1995. Palmer amaranth was found to be resistant to Postemergence applied HPPD inhibitors, products like Callisto, Laudis, Armezon, Impact, Balance Flexx, Corvus and others in 2009 in Kansas. This population was also found to be resistant to triazines and the ALS inhibitors. Glyphosate resistant Palmer amaranth was first documented in Kansas in 2011. It continues to spread and becoming a problem across the entire state. To date, we have not discovered PPO resistant Palmer amaranth as others have in some other states. Palmer amaranth, because of the multiple resistance, rapid growth rate, and densities has become one of the greatest threats to crop production in Kansas. Utilizing effective preemergence herbicides in conjunction with timely postemergence herbicide programs that also contain herbicides having soil residual control, applied to small Palmer amaranth (2 inches) will be the most effective way to manage this weed.

Waterhemp, also a pigweed, found mostly in the eastern third of the state was first found resistant to ALS inhibitors in 1995. In that same year, resistance to atrazine was discovered in waterhemp. Because waterhemp predominates in Kansas soybean growing areas, resistance to Post applied PPO inhibitors was found in 2001. PPO inhibitors include Blazer (many others with this active), Cobra, and FlexStar. This population was also resistant to the ALS inhibitors. ALS currently is wide spread where ever waterhemp exists. Glyphosate resistant waterhemp was discovered in Kansas in 2006. It too has become wide spread where waterhemp grows. To date, we have not found HPPD resistant waterhemp as they have in some other states.

Horseweed/marestail resistant to glyphosate was found in Kansas during 2005. This became wide spread and a serious problem for many soybean and cotton growers as it couldn't be managed postemergence in crop. Marestail resistant to ALS inhibitors was found in Kansas in 2011. In Kansas, the best time to begin controlling Marestail is the month of November. Using dicamba or 2,4-D in combination with a residual herbicide, depends on crop to be planted in the spring, is usually the best way to manage this weed. Early spring applications of dicamba tank mixed with other herbicides can be effect. Leaving marestail untreated until just before planting soybean or cotton will usually be a disaster.

We have discussed the "Big Four" resistant weed species in Kansas, however, several other species have been found to be resistant to a number of different herbicide since 1995. In continuous wheat rotations, frequent use of ALS inhibiting herbicides have led to resistant to ALS herbicides in the following species: bushy wallflower, 2005, Flixweed 2006, true cheat and Japanese brome, 2007, and henbit, 2014.

Additional weeds developing resistance to soybean herbicides include common sunflower, 1996 to Pursuit, Common cocklebur, 1997 to Pursuit and Classic and giant ragweed, 2006 and common ragweed, 2007 resistant to glyphosate. These weeds have not become a serious problem in Kansas. The ALS resistant sunflower was the source of ALS resistance used in Clearfield sunflowers. This was done through traditional breeding and is not GMO.

An additional weed species resistant to ALS corn herbicides was shattercane. ALS resistant shattercane was becoming wide spread in irrigated continuous corn fields in SW Kansas during the 90's. The development of glyphosate resistant corn, soybeans, and cotton, eliminated the shattercane problem, however, shattercane that continues to persist on field edges, maybe ALS resistant. ALS resistant shattercane from SW Kansas is the source of ALS resistance bred into Inzen sorghum hybrids. This was done through traditional breeding and is not a GMO.

Redroot pigweed resistant to triazines was discovered in 1995 in Kansas. Again this resistant weed has not become a problem for growers.

Future of herbicide resistant weeds will become even more complex in Kansas. Populations with resistance to multiple modes of action have been found and is likely to continue. Increased use of auxins and HPPD inhibitors in the new Soybean technologies will increase the likelihood of additional resistance development. Strategies for management will be PRE followed by POST herbicide programs and in some cases using POST herbicide programs that contain active ingredients which extent soil residual activity to control especially the difficulty pigweeds. Crop rotation and rotation of effective herbicide sites of action are also a key component to success.

CHANGING with the TIMES

By Aaron Saeugling
State University Field Argonomist

AS with all things relating to production agriculture weed control also evolves over time. We have all observed difficult weed challenges in our farming careers and I foresee those challenges in the near future. If we look back on herbicide history from the days of mechanical control for weeds to the wide spread utilization of herbicide we observe some changes in our weed control practices. Most recent memory includes use of glyphosate based weed control systems were extremely effective and economical to implement. While glyphosate is still going to be widely utilized here in SW Iowa it is no longer a simple system. We now have waterhemp, horseweed, and giant ragweed resistant to several herbicides we commonly utilize in corn and soybean herbicide programs.

I see weed control as one of the bigger challenges in the next ten years for farmers in SW Iowa. The major reason for this is the fact the physical work of scouting for weeds is time consuming and as farm size grows the time spent walking fields and identifying specific weed populations within a field is limited. SO I often get asked by farmers what is the best herbicide program. Well that my friends, that is not a one size fits all approach. This worked in the past! We in agribusiness and Extension now have to develop specific plans for farmers due to the fact we have more resistant weeds, tillage practices, and application timing issues. For starters I tell farmers to begin to develop a record system on each field and the weed challenges within that field. One useful resource is the 2017 Herbicide Weed Control Guide for Iowa Corn and Soybean Production (WC0094) this can be found in your local county extension office or on line from the Iowa State University Extension and Outreach Extension store.

SO key factors farmers need to implement for good weed management in SW Iowa include the following;

- Burndown herbicide applications where we utilized proper rates on small weeds can increase our effectiveness.
- Early season scouting of previously sprayed fields seven to ten days after application evaluate effectiveness, this allows time to re-spray if needed.
- Residual herbicide applications applied close to crop emergence. This allows for crop canopy to help with weed control.
- Narrow row soybean systems.
- Timely early post application for both corn and soybeans.
- Late season weed control evaluation.

While I see most fields in SW Iowa with adequate weed control I do believe weed control will be more complicated and expensive in the near future.

Tobey Jack's

Tobey Jack's Mineola Steak House

408 Main Street • Mineola, IA 51554
(712) 526-2078

HOURS of OPERATION

Serving lunch:
Monday – Friday 11:00 am -2:00 pm
Saturday & Sunday 11:00 am - 4:00 pm

Serving dinner:
Monday – Friday 5:00 pm - 10:00 pm
Saturday 4:00 pm -10:00 pm
Sunday 4:00 pm – 8:00 pm

We Cater any Party Big or Small

NEW WEEDS don't come around everyday

Bob Hartzler
Iowa State University
Extension Weed
Specialist/Professor
of Agronomy

Weed infestations continually respond to changes in production practices. The shifts are usually due to an increased prevalence of a weed previously found at low levels, but occasionally a new weed species invades the area. In over 30 years at Iowa State University I have witnessed two 'new' weed species become major problems. A third weed has recently invaded into the state, and could become a formidable foe down the road for Iowa growers.

My first new weed was woolly cupgrass. Woolly cupgrass is native to the same region in China as the foxtails, and was first identified in Iowa in 1957. In the mid-80's woolly cupgrass began to spread rapidly in Iowa, and was a serious problem for corn producers. At that time there were no effective post-emergence herbicides for grass control in corn. The large seed size of woolly cupgrass limited the effectiveness of available pre-emergence herbicides. Many fields in the state were

Woolly Cupgrass

Waterhemp

Palmer Amaranth

Continued to page 15

Continued from page 14

planted to continuous soybean to allow the woolly cupgrass infestation to be reduced to a level where corn could be grown again. Many people felt woolly cupgrass was destined to replace foxtail as Iowa's dominant grass weed. However, the introduction of new herbicides provided better options for managing the weed in corn. Woolly cupgrass is still present, but is rarely a driver weed for Iowa growers.

My second newcomer was waterhemp. Unlike many of our weed problems, waterhemp is native to Iowa, but was rarely found in crop fields until the 1990's. The exact reason why waterhemp suddenly moved from non-crop areas into crop fields still mystifies weed scientists. Waterhemp first emerged as a problem in southern Iowa where Extrazine (atrazine + cyanazine) dominated the corn market, but it quickly spread across the entire state. Waterhemp has many traits that contribute to its weediness, including prolific seed production, prolonged emergence pattern, persistent seed, and the ability to rapidly evolve resistance to herbicides. Although most people think of herbicide resistance as the source of waterhemp's 'superpowers', it is the combination of the biological factors that make waterhemp Iowa's number one weed problem.

Waterhemp is native to Iowa, but was rarely found in crop fields until the 1990's.

Palmer amaranth is my third new weed. It is the first agronomic weed I have actually witnessed the initial invasion - I am hopeful I won't see it conquer our state. Palmer is a close relative of waterhemp, but is native to the Southwest United States. Palmer amaranth's initial migration was to the east, and it has been one of the Southeast's major weed problems for at least 30 years. In the past decade it began moving northward, and is found in Iowa, Minnnesota, Wisconsin and other Cornbelt states.

Palmer amaranth was first identified in Iowa in Harrison County in 2013. Later in 2013 Palmer amaranth was found in four additional counties - Page, Fremont, Muscatine, and Lee. It is believed these infestations were due to seed hitchhiking on equipment or in supplies used in traditional farming operations.

Palmer amaranth can cause a 41% greater soybean yield loss than waterhemp.

At the start of 2016 Palmer amaranth was known to infest five Iowa counties, but by the end of 2016 the weed had been found in 49 counties. I was surprised by both the large increase in Palmer amaranth infestations in Iowa and the primary means of introduction. Palmer amaranth was introduced into at least 36 counties due to planting of native plant seed mixes contaminated with Palmer amaranth seed. The large increase in government programs for conservation plantings (Iowa had more than 64,000 acres enrolled in pollinator habitat) overwhelmed local producers of native seeds, and seeds of several native species were imported from states with widespread Palmer amaranth infestations.

Palmer amaranth is similar to waterhemp in many ways, but the most important difference is that Palmer amaranth is much more competitive than waterhemp. Research has shown that Palmer amaranth can cause a 41% greater soybean yield loss than waterhemp at similar densities. The competitive nature of Palmer amaranth will require growers to spend more money to achieve a higher level of control than commonly obtained with waterhemp. If growers fail to achieve a high level of control their yields will suffer. This is the reason why the invasion of Palmer amaranth in the state should be taken seriously.

WINNING THE WEED WAR on Your Acres

Growers are faced with making more choices than ever when it comes to weed control programs. New herbicides and traits are entering the market rapidly. The question being asked is, what is the best trait / herbicide combination to use? I think to answer that question we need to review a little history lesson. I grew up in the late 1970's and early 1980's. I mention that to help everyone remember our weed control strategies back then. Corn was simple. Pre plant tillage, followed by planting and an application of a grass herbicide and atrazine. This was typically followed by an application of 2,4-D or Dicamba and a lay by cultivation. A very good program approach. We used multiple modes of herbicides (alachlor, atrazine, and 2,4-D), mechanical control (pre plant tillage and row cultivation), and it was my favorite because it worked well and my parents never got me out of bed at day break to walk corn! Soybeans were a different deal!! Growers normally started with multiple tillage trips across the field incorporating a herbicide like Treflan and sometimes a triazine like Sencor or Lexone. It gave you a pretty good start to the season. This would normally be followed by Basagran, cultivation, and walking with bean hooks several times. A good program again. It used mechanical weed control (pre plant tillage, row cultivation, and hoeing), it also involved multiple modes of herbicides (Treflan, Sencor, and Basagran). Back in those days choices were limited, but with intensive management the programs were very effective.

As we moved forward through the years more choices became available. In the late 80's STS technology became available and the use of Pursuit herbicide became widespread. Those choices rapidly moved to Glyphosate when Roundup Ready soybeans were introduced in the late 1990's. Moving to this system gave growers a cost effective, easy to use highly effective weed control system. At this point growers were trending towards less tillage and less residual herbicides on soybeans. With that being said, farmers began using less herbicide modes of action and very little or no tillage. Over the next several years more issues began to develop with weed control and possible weed resistance.

As we look toward the future many new trait options and herbicide programs are going to be available. All of those programs will offer the promise of being the best program. The bottom line will continue to be a program approach. As we discussed historically, multiple modes of herbicides and tillage can greatly increase the effectiveness of weed control programs. This will help achieve the weed control that farmers are looking for and help protect the technology and keep it viable for the future.

John Long
Commercial Agronomist
Southwest Iowa Mycogen Seeds

Carlson Seed

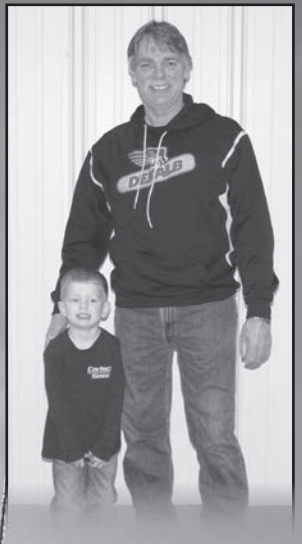
Growing One Seed at a Time

ASGROW

DEKALB

CARLSON SEED OFFERS:

- All types of seed - including small seed sales *(Asgrow • DeKalb)*
- Chemical Programs • Full Line of BANJO Fittings
- Precision Planting• Climate Corp.



CARLSON & SON, INC:

Buys - Sells - Hauls Your Grain, Rock, Fertilizer, Equipment, Seed, Rock and Anything Else You Need Hauled!

1978 310th Street Blanchard, Iowa

712-583-3589

We've Been Fighting Resistant Weeds for Sixty Years?!

Clarke McGrath
Agronomist and
On Farm Research
Director
Iowa Soybean
Research Center

I recently learned that as we head into crop year 2017, we are "celebrating" a dubious anniversary; in 1957 growers and researchers ran across the first known herbicide-resistant weeds. While they aren't weeds that we fight here- they were a spreading dayflower found in Hawaiian sugarcane and a wild carrot variety found in Ontario, Canada- both showed resistance to the same herbicide group. Records show that some of these weeds were able to survive up to five times the normal dose of synthetic auxin herbicides.

I shared this random bit of trivia with some fellow growers and agronomists one recent evening over some cold beverages, sort of hoping that using the words "synthetic auxin" would be so impressive that they'd buy the next round. "No kidding?!" one of them said, and a couple others expressed similar thoughts. I had them, no need to get my money out... then he went on to say "if flowers and carrots could do it 60 years ago, I wonder why it took so long to get soybeans that are resistant to synthetic auxins!" We all laughed… and I bought. More on synthetic auxins and soybeans later.

In the sixty years since those first herbicide resistant weeds were found, scientists have documented around 250 more weeds around the world with resistance to one or more of 23 out of the 26 herbicide modes of action. According to information from the EPA, in the US we have at least 155 weeds resistant to one or more herbicide modes of action. Other estimates say acres with resistant weeds have more than doubled in the U.S. since 2009; some put us over the 70 million-acre mark. Economists say herbicide-resistant weeds cost U.S. farmers $2 billion annually, a number that keeps climbing as they spread across more acres.

Ok, so that is a look at the "big picture", but what about closer to home? According to weedscience.org, Iowa is home to 17 different species of herbicide tolerant weeds, with the most troublesome probably being waterhemp, giant ragweed and marestail. With palmer amaranth documented in at least 49 counties across Iowa now, at some point in time we may be adding that to the list.

Waterhemp… that is a weed that came out of nowhere to create a lot of headaches, was seemingly beaten into submission during the glory days of glyphosate, and then has come back with a vengeance. I recently had the chance to talk to Lynn Gronborg, who

Continued to page 19

Continued from page 18

farms near Avoca, about our experiences with weed management. As a valued customer during my decade in retail, we put together a lot of weed management plans. "Cocklebur and sunflowers were probably the weeds that gave us the most trouble when we were still doing some tillage" Gronborg said when I asked about his experiences with weed management and dealing with weed resistance. "Transitioning to minimum till and no-till systems in the late 80's and early 90's, along with using products like Pursuit, Classic and Concert, we didn't see as many sunflowers and cocklebur; our beans were pretty clean." "With the shift to no-till a lot of us used Extrazine on the corn since it was a good no-till burndown and had pretty good residual. The first few years of this, we didn't always have to come back in to spray post broadleaves, our pre-emerge programs worked pretty well".

I had a pretty good idea what was coming next, since I was a rookie agronomist at Avoca in the early 90's. "You had been the agronomist for a season or two, and we started to see more pressure from small seeded weeds, mostly pigweed, but a little more trouble with grass in the corn too. So "we" decided to bump the Extrazine rate up for the next year". We had a laugh over that, since I'm pretty sure it was my bright idea to use a higher rate after consulting with the chem rep. Across the Midwest, similar conversations were happening during those years, and we bumped product rates up, or shifted products around, but everyone knows how the story goes. "We increased rates of the corn pre's, still had to come back over the top to clean up more and more pigweed and we started having to add things like Cobra and Blazer to our post programs in the beans" Lynn recalls.

It wasn't every acre, but we had a lot of them- we were running into our first real challenges with weed resistance. Waterhemp was perfectly adapted to our growing number of no-till acres, and at the same time it quickly evolved resistance to a couple of our big guns, group 2 and group 5 herbicides.

To make a long story short, we adapted tactics and while weed management costs did go up for a lot of growers in the early to mid 90's and fields weren't typically perfectly clean at seasons end, we could hold our own against waterhemp in most cases. But especially in beans, we were far from satisfied. Enter Roundup Ready Soybeans; we had never seen anything that close to a "silver bullet", and some say we may never see anything like the success of that system again. Chemical costs crashed, fields were nearly spotless, and the introduction of RR Corn just sweetened the deal; I've heard this called the "Golden Age" of weed control. It's hard to argue; the so called "tailgate cocktail" exotic tank mixes a lot of us retail agronomists had concocted to knock back weeds were a thing of the past, or so we thought.

As it turns out, history repeated itself and after nearly eradicating waterhemp (and about every other weed in sight) with glyphosate, Mother Nature managed to mount a comeback. Fast forward to today; we have an increasing number of glyphosate resistant weeds, and maybe more concerning are the species resistant to multiple herbicide groups- with waterhemp at the top of the list.

A "go-to" set of herbicides we have used to fight glyphosate resistant waterhemp in soybeans has been the group 14 PPO inhibitor products like Aim, Cadet, Cobra, Flexstar, Sharpen, Ultra Blazer, Valor and others. A couple of years ago, the University of Illinois Plant Clinic started screening waterhemp for herbicide resistance to glyphosate and PPO inhibitors as reports of escapes from both herbicide groups were and increasing problem in Illinois. The clinic received samples from 10 states across the Midwest in 2016; in the 378 samples from Illinois, 48% were resistant to both glyphosate and PPO inhibitors. Out of the 87 samples sent from Iowa, resistance to both herbicides was detected in 75% of them.

OK, so our look back on weed management and resistance lays out a pretty good case for the concept that weeds can overcome about anything we throw at them. We may not be able to return to the simplicity and ease of weed control during glyphosates "Golden Age", but let's take a look at how we can get close- and hopefully head off more resistance challenges.

We have to think about weed management in terms of a proactive and integrated approach. ISU's Dr. Bob Hartzler often reminds us that we have to have "zero tolerance" for resistant weeds, and this is probably a pretty good mindset for plain old hard to control weeds too.

Borrowing from Dr. Hartzler, his fellow weed scientists and our own experiences, here are some tactics to manage our current resistant weeds and hopefully slow the evo-

Continued to page 20

Continued from page 19

lution of new ones;

- Know what weeds you are facing; field histories and scouting are valuable tools
- Start clean with effective tillage or burndowns
- Stay clean with full rates of effective residual herbicides
- Use multiple, effective herbicide modes of action
- Rotate herbicide-tolerant traits
- Rotate crops if possible
- Proactively manage post emerge apps, i.e. small weeds, favorable growing conditions, quality additives
- Recognize and manage weed escapes- with zero tolerance for resistant or challenging weeds
- Clean equipment as well as you reasonably can to prevent movement of seed from resistant weeds

I had the chance to talk with many other growers and agronomists while I was putting this article together, including Brian Sieren with 1st Choice Commodities. Sieren started his farming career as an employee of an operation based in Pottawattamie County for several seasons prior to having the opportunity to transition into a family farm in Crawford County that he now operates. With his experience and perspective from time with multiple farming operations, he concurs with much of the list of management practices above.

"My first few years of farming, there were still areas were two trips of Roundup worked, but resistance ended that for the most part not long afterwards. We saw that starting with a good pre herbicide helps keep weed pressure from getting started, and timely post emerge applications are critical. Of course the weather doesn't always cooperate for perfect timing and once in a while a post application turns into more of a rescue treatment. When it comes to that, it feels like I'm spinning my wheels, the weed control just isn't good enough." Sieren and others I talked to agreed; a strong pre program is a good start, and with post emerge applications they'd rather be closer to spraying "too early" than too late.

They might not all be on the "zero tolerance" bandwagon, but many I talked to were headed in that direction. "I try to keep weeds out of the ditches, waterways, headlands, terraces and other non-crop areas" said Sieren, who added "and as neighbors we do a good job of working together to spot and spray or mow weeds in our border areas between our fields. Now with palmer amaranth in our area, we'll all really be on the lookout for that."

After leading off with the 60 year anniversary of resistant weeds, I mentioned we'd get back to synthetic auxins and soybeans. The launch of soybeans that are tolerant of synthetic auxins (dicamba on Xtend beans and 2,4-D on Enlist beans) expands our options when it comes to management practices like using multiple herbicide modes of action and rotating herbicide tolerant traits. We may also have access to HPPD tolerant beans as well. Adding these to our herbicide tolerant soybean lineup that already includes a very effective Liberty Link soybean system will be a big help against some pretty tough weeds, especially glyphosate and PPO resistant waterhemp. I don't think they'll be the "silver bullet" that glyphosate was in the mid to late 90's, but if we handle them right, they'll be excellent tools. Handling them right includes sticking tight to the stipulations in the seed technology agreements and the herbicide labels; I doubt there has ever been a product launch under as much scrutiny as synthetic auxin beans. The unfortunate and preventable series of events surrounding dicamba resistant crops that happened in some southern states last summer probably ensured that.

And this brings it all full circle, where I try to tie weed management, weed resistance management and herbicide resistant trait preservation together. I mentioned earlier that we have weeds with resistance to one or more of 23 of the 26 herbicide modes of action; did I mention that we haven't had a new mode of action come to market in about 30 years? A look at the herbicide pipeline doesn't give us a lot of optimism that we'll be getting any new modes of action anytime soon. So… our new tools to fight weeds will likely continue to consist of developing (and then eventually stacking) resistance traits to current products and inserting them into our corn and soybean genetics. But we will need to follow the rules and implement as many management practices as we possibly can, or we'll fight an increasing number of resistant weeds. Maybe knowing that 60 years ago "flowers and carrots" became resistant to the same family of herbicides that are the cornerstone of new technology being launched this year will help keep us at the top of our game.

Have a safe and successful 2017!

HERBICIDE RESISTANT WEEDS Concern Northwest Missouri Growers

Area growers have been working hard to prevent the spread of resistant weeds into their fields. Their focus has been on glyphosate resistant tall waterhemp and marestail. Despite all the work to prevent the movement of resistant weeds, more area fields are having herbicide resistance problems.

Growers have been using multiple herbicide modes of action. They have been rotating herbicides. However, growers are finding waterhemp in northwest Missouri fields with multiple modes of herbicide resistance. Multiple modes of herbicide resistant weeds are becoming the norm rather than an isolated incident.

Surveys conducted by Dr. Kevin Bradley, University of Missouri State Weed Scientist, indicate four and five way herbicide resistant waterhemp fields are in Nodaway and Atchison counties in Missouri.

Many factors contributed to the increase in herbicide resistant weeds in northwest Missouri. Initially, one overriding factor was using only a total glyphosate system without any other herbicide. In addition, growers wanted to receive the most weed control for dollars spent, which meant delaying applications until weeds were large but within label specifications to make only one application.

This has now all changed. Growers are using different herbicides with multiple modes of action and using pre-emergence herbicides. They are also following labeled weed heights when making post emergence herbicide applications. However, we are seeing fields with waterhemp escapes. It is important to control these so we prevent seed production. Also, be sure to use pre-emergence herbicides when using any post-emergence control herbicides.

Increased herbicide costs have growers' attention this year. Crop budgets in many situations are showing negative returns. However, it is advisable not to reduce your budgeted herbicide dollars but look for other areas of the budget to reduce costs. Cutting herbicide costs can result in poor weed control and increase weed seed production from herbicide resistant weeds.

To save dollars, growers may find savings using bundled seed and herbicide products. Check with your local seed representatives about any cost saving using seed and herbicides from same manufacturer. In addition, saving may be found using generic herbicides and early prepay programs.

Marestail is an increasing problem weed in many area no-till fields. The plant typically germinated in fall and bolts in spring. However, now the growth habit has changed so many plants emerge in spring. This weed is difficult to control once it moves from rosette to growing a stem. Within the marestail population, there are glyphosate resistant plants. Before planting soybeans, be sure the seedbed is weed free.

Although not glyphosate resistant, we are also finding a new weed, Palmer amaranth, in the Missouri River Bottom. This weed has shown herbicide resistance in other states and our primary objective should be seed prevention. This weed is extremely competitive. Do not allow this plant to get started in your fields.

Wayne Flanary
University of Missouri
Extension
Northwest Regional
Agronomist

LISTENLIVE 960 AM 99.1 FM Sign Up Log In

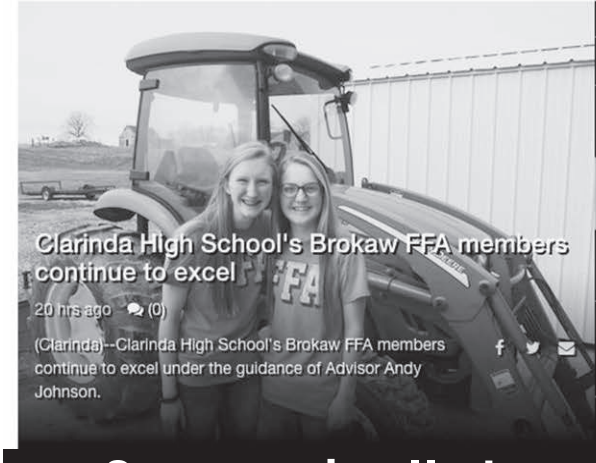
KMA LAND 960 AM & 99.1 FM

KMA is where YOU are.

KMA AM 960 & KMA FM 99.1, KMAland.com, Video, Facebook, Twitter, Instagram...

41° Clear Search...

News | Sports | AG | Funerals | Auction Block | KMA E-Shop | KMA Programs | Community | Cancellations | Weather | ListenLive



HEADLINES

- Williams: "think before you burn"
- "Stand your ground" bill advances in House committee
- Clarinda High School's Brokaw FFA members continue to excel
- Atchison County offers storm spotting class
- Shenandoah incinerator usage down, citywide clean up set for April

Skywatchers I Current KMA Weather I Weatherology Radar I Weather Reports I On Track Forecast

Sign Up For Newsletters

Our team is all about making a positive difference in the lives of people in KMAland!!!

Palmer Amaranth Infestion NEW TO IOWA

Matt Witt
Iowa State University
Field Agronomist

During the summer and fall of 2016, Palmer Amaranth was discovered in approximately 43 Iowa counties with the majority of those in newly established Conservation Plantings. These new weed infestations, that has the potential to cause significant problems if not properly managed, has troubled many Iowa farmers. Management of these infestations is at the forefront of many farmers' minds as the spring season approaches.

This is especially true in West Central Iowa where there have been multiple fields discovered with Palmer Amaranth Infestations. These infestations have ranged from a few plants per acre to over 50 plants per acre with field sizes ranging from an acre to 240 acres per field. With this large variety of infestation rates and field size the management of these fields is a challenge. The first step in management is understanding Conservation Planting contracts that farmers have with the USDA. Communication with local offices and staff is critical to ensure that the management steps taken by farmers will not put them in violation of their contracts. Once the rules have been established of what farmers can do then the work of what to do should begin.

Management of Palmer Amaranth in Conservation Plantings requires scouting of fields to be effective. Understanding high risk areas such as plantings that occurred in 2016, livestock operations that import feed and bedding from the southern United States where Palmer Amaranth is prevalent, commercial grain handling facilities and bordering fields of all of these areas. Focusing attention and scouting on these areas will allow you to be the most efficient with Palmer Amaranth. If Palmer Amaranth is discovered, however, there are a few ways to handle the situation but there is no full proof method for eradication.

Mowing of conservation fields is a good management tool in early seasons for 2017. Regular mowing throughout the year to keep infested fields low will help in management. The mowing will not eliminate all plants and be a catch all but it will help to keep plants from producing large volumes of seed in the fall. Regular scouting, spot spraying if allowed and hand rouging may be required in fields to control plants that escape.

Some farmers in west central and across Iowa have made commitments to the extra work necessary to help control this weed from getting into regular production systems. However more help is needed from farmers and communities to become educated on identification and management of Palmer Amaranth. Communication with local Extension personnel, commercial agronomists and professionals and other members of local communities is critical to make sure Palmer Amaranth is properly managed.

A Summary of MU Weed Science Extension and Research Projects Directed Towards the Management of Resistant Weeds

Knowing When to Spray: Monitoring Temperature Inversions and Wind Speed Profiles

The group 4 synthetic auxin herbicides are commonly associated with drift and injury to non-target plants, such as tomatoes, grapes, and soybean. The impending introduction of dicamba and 2,4-D-resistant traits into the soybean and cotton markets is likely to cause increased usage of synthetic auxin herbicides. The focus of this ongoing research is to monitor factors associated with the risk of synthetic auxin herbicide drift in Missouri by analyzing historical wind speed data and investigating the frequencies and intensities of surface temperature inversions.

High wind speeds can lead to physical drift of herbicide particles in which the chemical never reaches the intended plants. The Environmental Protection Agency (EPA) considers herbicide applications made during wind speeds exceeding 10 mph as high risk for off-target herbicide movement. To identify times throughout the growing season that wind speeds are most likely to surpass the 10 mph threshold, the average hourly wind speeds for every March to August day from the years 2000 to 2015 were retrieved from the Missouri Historical Agricultural Weather Database for 5 regions within the state. For each region, the hourly wind speeds for all March days within the 15 years were averaged together and graphed to profile the wind speeds throughout a typical March day. Similarly, hourly wind speed graphs were generated to represent typical April, May, June, July and August days for each of the 5 regions. In 3 out of the 5 regions analyzed, average wind speeds during mid-day hours of March, April, and May exceeded 10 mph.

Surface temperature inversions occur when air nearest the earth's surface is cooler than the air above it; they create a stable atmosphere that is conducive for herbicide volatilization. To monitor surface temperature inversions, weather stations at 3 regions within Missouri were fitted with temperature sensors at 18, 66, and 120 inches above the soil surface in January of 2015. Temperatures were recorded every 3 seconds, and those temperatures were averaged to generate a 5-minute temperature reading at each height. The 5-minute temperatures were compared to identify inversions in which the 18-inch temperature was coolest and

Continued to page 32

Continued from page 31

the 120-inch temperature was warmest. Preliminary results from March to July of 2015 indicated that inversions occurred at all 3 locations in each of the 5 months. The intensity of most inversions was 1 to 3° C different between the 18 and 120″ heights. This ongoing research will be useful to equip herbicide applicators with information to help steward the new weed control technologies. More information on good stewardship with synthetic auxin herbicides can be found in the "Good Stewardship and Herbicide Tolerant Crops" video at: weedscience.missouri.edu/video.cfm

Survey of Missouri Pesticide Applicator Practices, Knowledge, and Perceptions

The introduction of the synthetic auxin herbicide-tolerant soybean and cotton traits to market has led to an increase in the concerns over the ability of synthetic auxin herbicides like 2,4-D and dicamba to move away from intended targets and onto non-target plants. To understand current herbicide applicator practices and applicator knowledge and awareness of the new synthetic auxin technologies, a direct-mail survey was sent to Missouri pesticide applicators in the winter of 2016. Completed surveys were returned by 2335 applicators, representing 10.5% of the state's registered pesticide applicators. Respondents were grouped into either commercial or private pesticide applicators based on their license. The survey identified areas where further education and awareness are needed. Neither the commercial nor private pesticide applicators were likely to read herbicide labels each time prior to mixing and spraying. With regards to physical drift of herbicides, survey results indicate that both commercial and private pesticide applicators have an understanding of how wind can contribute to off-target herbicide movement. When asked about checking wind speeds prior to making herbicide applications, over 95% of commercial and private pesticide applicators indicated that they check wind speeds prior to making herbicide applications >50% of the time. Furthermore, when asked which of three factors, drift volatility or tank contamination, is most likely to result in off-target herbicide movement, both groups selected drift as the most likely. The survey results also reflect a need for continued education with regards to the ability of herbicides to volatilize as well as knowledge of the new dicamba- and 2,4-D-resistant traits. Differences in understanding and practices between commercial and private pesticide applicators can also be observed within the results. Overall, findings from this survey highlight specific areas or gaps in the knowledge and practices of Missouri pesticide applicators with regards to synthetic auxin herbicides and traits; many of which can be addressed with focused education and training efforts. More information on good stewardship with synthetic auxin herbicides can be found in the "Good Stewardship and Herbicide Tolerant Crops" video at: weedscience.missouri.edu/video.cfm

Influence of Tillage Systems on Pigweed Emergence in Soybean

A field study was conducted in 2014 and 2015 in Arkansas, Illinois, Indiana, Ohio, Tennessee, Wisconsin, and Missouri to determine the effects of tillage system and herbicide program on season-long emergence of Palmer amaranth and waterhemp in soybean. The deep tillage (moldboard plow) system resulted in a 62, 67, and 73% reduction in pigweed emergence when compared to the conventional, minimum, and no-tillage systems, respectively. The residual herbicide program also resulted in an 87% reduction in pigweed species emergence compared to the POST-only program. The deep tillage system, combined with the residual program, resulted in a 97% reduction in pigweed species emergence when compared to the minimum tillage system combined with the POST-only program, which had the highest emergence. Soil cores taken prior to planting and herbicide application revealed that only 28%

Continued to page 33

Continued from page 32

of the pigweed seed in the deep tillage system was placed within the top 5-cm of the soil profile compared to 79, 81, and 77% in the conventional, minimum, and no-tillage systems. Overall, the use of deep tillage with a residual herbicide program provided the greatest reduction in pigweed species emergence, thus providing a useful tool in managing herbicide-resistant pigweed species where appropriate. More detailed information on "The Influence of Tillage Methods on Pigweed Emergence" can be found at: weedscience.missouri.edu/extension/slideshows.cfm

Influence of Cover Crops on the Emergence of Waterhemp and other Weeds in Soybean

Field experiments were conducted in 2013, 2014, and 2015 in Columbia and Moberly, Missouri to determine the effects of cover crops on winter and summer annual weed emergence in soybean. Cereal rye and cereal rye plus hairy vetch reduced winter annual weed emergence by 72 and 68%, but were not comparable to the fall herbicide treatment which reduced winter annual weed emergence by 99%. Early season waterhemp emergence was similar among treatments of cereal rye, cereal rye plus hairy vetch, and the spring PRE residual herbicide program. In contrast, cereal rye, cereal rye + hairy vetch, winter wheat, winter oat, crimson clover, Austrian winter pea, hairy vetch, and tillage radish reduced late season waterhemp emergence between 21 and 40%, but were not comparable to the spring PRE residual herbicide program, which reduced late season waterhemp emergence by 97%. Overall, results from this experiment indicate that certain cover crops are able to suppress winter and summer annual weed emergence, but soil applied residual herbicides provide more consistent control. More detailed information on "Cover Crop Effects on Winter and Summer Annual Weed Emergence" can be found at: weedscience.missouri.edu/extension/slideshows.cfm

Effectively Terminating Cover Crops

Two field experiments were conducted in 2013, 2014 and 2015 to determine the most effective herbicide program for the termination of winter wheat, cereal rye, crimson clover, Austrian winter pea, Italian ryegrass, and hairy vetch. The most consistent control of broadleaf cover crops occurred following treatment with glyphosate + 2,4-D, dicamba, or saflufenacil (Sharpen). In general, glyphosate-containing herbicide treatments provided the most consistent control of grass species compared to paraquat (Gramoxone) and glufosinate (Liberty). Across all timings, glyphosate + clethodim (Select) provided at least 98% control of Italian ryegrass while glyphosate alone provided between 87 and 94% control of cereal rye and winter wheat. Biomass reduction was greater following earlier applications, but certain treatments still provided adequate control at mid or late application timings. Thus, growers seeking to maximize cover crop residue can delay termination without sacrificing effective control. More detailed information on "Burning Down Cover Crops Effectively" can be found at: weedscience.missouri.edu/extension/slideshows.cfm

Next Day Air: Waterfowl and Weed Seed Distribution

Migratory waterfowl have often been implicated in the movement of troublesome agronomic weed species. Previous research has shown that migratory waterfowl have the ability to transport invasive wetland weed species. However, little to no research has been conducted to investigate the long-distance dispersal of agronomic weed species such as Palmer amaranth and waterhemp. Thus, two objectives were set forth for this research project. The first was to determine what weed species are being transported

Continued to page 34

Continued from page 33

throughout Missouri by ducks and snow geese. Beginning in the fall of 2014, 238 ducks and 111 snow geese were collected from Missouri waterfowl hunters. These birds were dissected to remove weed seed from each bird's esophagus, gizzard and intestines. Recovered seeds from each section were then planted by individual organ section in the greenhouse. Emerged seedlings were identified by species, counted, and removed from the flats every 2 weeks for 3 months. Almost 14,400 weeds representing over 50 distinct species emerged from the digestive tract contents of the hunter-harvested ducks. The three species representing the largest portion of the emerged weeds were barnyardgrass, pigweed species, and smartweed species at 5494, 4311, and 3454, plants respectively. Waterhemp made up the second largest recovered species within the esophagus, gizzard and intestines at 38, 11, and 19%, respectively. From the hunter-harvested snow geese, 87 plants emerged representing 12 species. The three plants most commonly recovered from all dissected organs were corn, smartweed species and pigweed species at 45, 30, and 9% respectively. Palmer amaranth was one of the pigweed species recovered from the snow goose intestines. These results indicate that waterfowl, particularly ducks, are consuming many agronomic weeds, including waterhemp and Palmer amaranth, and transporting them throughout Missouri with the potential to disperse these seeds over long distances.

The second objective of this study was to determine the recovery rate and viability of 13 agronomic weed species after passage through a duck's digestive system. A feeding study was conducted on live mallards in the summer of 2015 and repeated in the fall of 2015. Adult mallards were precision fed 1-gram meals of a known quantity of seed from 1 of 13 different agronomically important weed species. The ducks were placed into individual cages immediately after feeding where each duck's fecal samples were collected every 4 hours up to 48 hours after feeding. Data from the feeding study also supported the potential for long-distance dispersal of weed seed through waterfowl consumption. Intact seed was recovered from 11 of the 13 weed species fed. Waterhemp and Palmer amaranth seed recovery was 19 and 12%, respectively, within the 48-hour monitoring period. These results illustrate the potential for waterfowl to provide long-distance dispersal of agronomic weed species. More detailed information on "Waterfowl and Weed Seeds" can be found at: weedscience.missouri.edu/extension/slideshows.cfm

Multiple-resistant Waterhemp Control in Liberty Link Soybean

Field experiments were conducted in 2012 and 2013 to determine the effects of row spacing, seeding rate, and herbicide programs on multiple-resistant waterhemp control and yield in Liberty Link soybean. Results indicate that a program that contains a good pre-emergence, residual herbicide followed by a post-emergence application of Liberty plus another residual herbicide (i.e., an overlapping residual herbicide program) provides greater control of resistant waterhemp compared to the two-pass POST herbicide program of Liberty alone. In 2012, the overlapping residual program resulted in a 99% waterhemp density reduction and 2.3 Bu/A increase in yield compared to the 72% density reduction by the two-pass POST program. Waterhemp control and density reduction was always greatest with 7.5- and 15- compared to 30-inch rows.

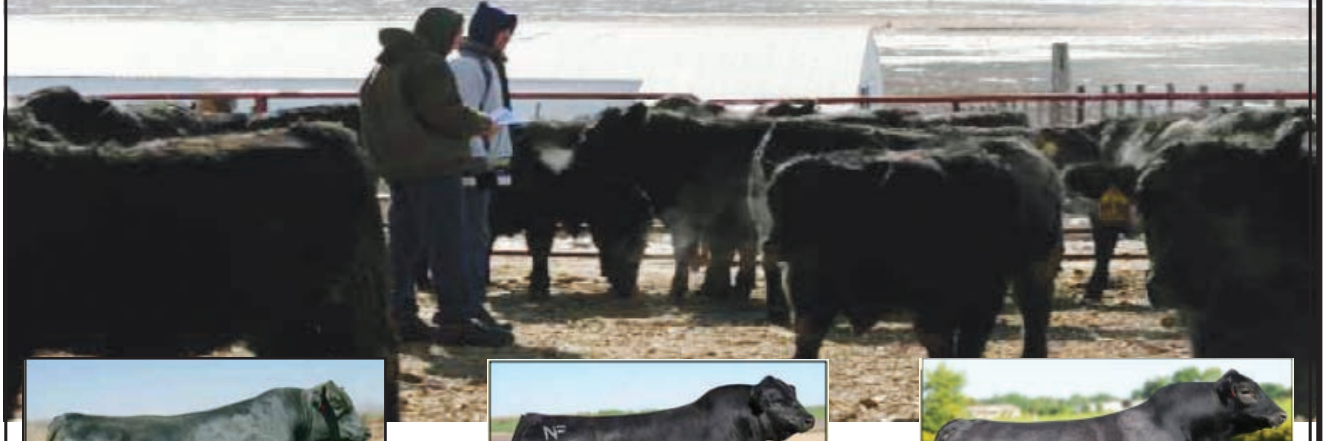
Soybean seeding rate did not affect waterhemp control or density in either year. Overall, results from these experiments indicate that the use of an effective overlapping residual herbicide program, narrow-row spacing, and seeding rates of 100,000 to 140,000 seeds/A or greater provides the greatest waterhemp control, density reduction, and soybean yield when multiple resistant waterhemp is present.

Nichols Farms

63 Years of Superior Beef Genetics

"Large or small, old or new – Nichols customers are our friends, and can expect the same level of performance and service from our seedstock and our team. And you will have the benefit of being a part of the Nichols family."

Come and take a look at some of the best bulls in the beef industry. – dave nichols



2188 Clay Avenue
Bridgewater, Iowa 50837
***office* 641-369-2829**
***Fax* 641-369-2932**
***Dave's home* 712-762-3810**
***Ross Havens cell* 641-745-5241**
www.nicholsfarms.biz

TFS TOTAL FARM SOLUTIONS

TFS AGRONOMY LLC

Your Local Syngenta Seed Advisor

- Corn and Soybean Seed
- Small Grass Seed
- Fall Rye Seed
- Seed Care Treatment
- Crop Protection Products & Custom Application
- Dry Fertilizer & Custom Application
- Bulk Soybeans & Delivery
- Crop Scouting
- GPS Services
- Dual Placement
- Data Record Keeping
- And much more!

Eric and Cala Hough
Aaron and Laurie Sick

GoldenHarvest Corn

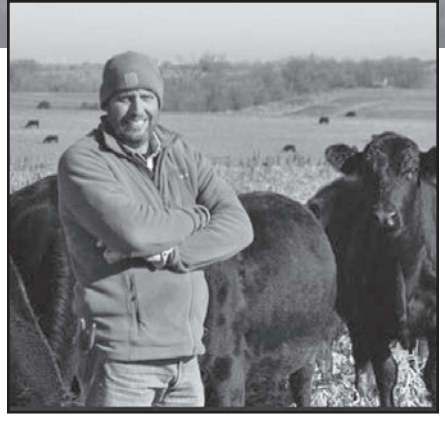
NK Soybeans

Eric 712-310-8289 Aaron 402-659-8970

West side of Carson • 712-484-3488 www.totalfarmsolutions.com

Systems Thinking on Pinhook Farm

SHARING THE STORY OF TRANSITION TO APPLYING NEW WAY OF APPROACHING ISSUES



Seth Watkins
Page County farmer

Our food system is complex. How I farm and what I raise doesn't just affect me. My decisions affect human health, our environment, our political system and ultimately the very stability of our planet. As the forces of a growing population are placed on agriculture, it is critical that we understand the relationships between all aspects of our food system. Taking a 'systems thinking' approach to problem solving will be a valuable tool in helping us make our farms, our state and ultimately our planet a happy place to live.

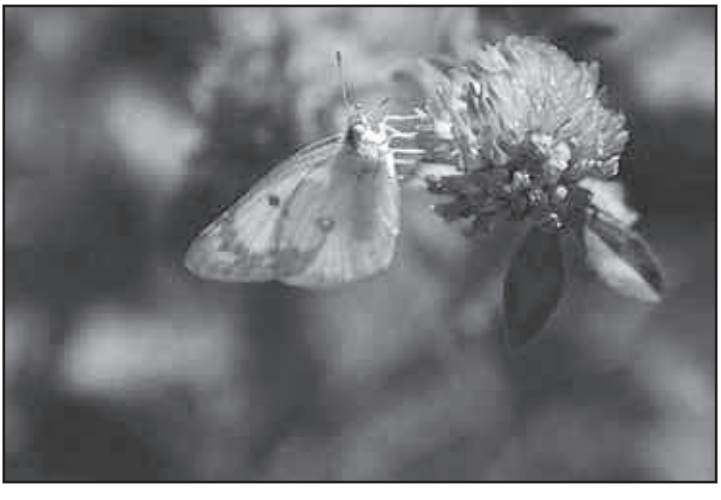
Systems thinking is not an easy subject, and thinking about what we're actually doing is not always pleasant. Most of us are linear thinkers. We have been taught to see an obvious and direct relationship between cause and effect. For example, a linear thinking solution to low yield would be to use more fertilizer. A systems thinking approach teaches us that that the relationship between a problem and its cause can be in-

Continued to page 41

Continued from page 40

direct and not always obvious. A systems thinking approach to low yield would be to ask, "Why is my soil not more productive?" This approach would offer solutions that involve understanding complex properties and processes such as soil type and structure, organic matter, carbon to nitrogen ratios and conservation practices. Asking "why" instead of "how" makes us really think about what we are doing and is the thinking that can lead to long-term sustainable solutions that minimize unintended consequences.

I am grateful to share my story of how I transitioned to applying systems thinking to problem solving on my farm. But I want to disclose that learning about systems thinking is a lifelong endeavor, and I am an amateur at best. The best systems thinking model I know of was developed by Jay Forrester at the MIT Sloan School of Management. I know Forrester has to be a good guy because he grew up on a cattle ranch in the Sand Hills of Nebraska, and he often credits his ranch background with his ability to see interrelationships in complex systems. My favorite short description of systems thinking comes from one of Forrester's students, Mike Goodman: "Systems thinking is all about trying to figure out why something is happening, not what to do about it. It's a system that's 90% diagnosis and 10% treatment, rather than the 10:90 ratio used in quick fix responses."2 Do not misconstrue this for touchy feely "lets think about this" to avoid working nonsense. This means really looking at what we're doing, then implementing and executing the changes needed to make our operations resilient, profitable and sustainable. I was not aware of the term systems thinking when I started to implement its principles on my farm. Prior to March 1998 I ran my operation in a linear manner. I calved my cows in February and March because that's what I was told to do. I asked my veterinarian, feed representative, extension personnel and implement companies how to solve problems. They responded to my demands with new vaccines, antibiotics, feed products, university data and bigger more durable equipment to handle the February/March weather in Iowa. Not only did my industry resources find solutions to my problems, they gave me free hats, pocketknives and even the occasional free steak dinner (complete with a white linin tablecloth and two forks at each place setting). They told me this was because Seth Watkins Image republished by permission of the Kansas City Star



Continued to page 42

Continued from page 41

GETTING INTO SOIL & WATER PAGE 9 I was feeding the world, and that made me special. I was also taught that some people were concerned about aspects of our food system, but that I should not concern myself because today's consumer didn't understand the complexities of modern agriculture and how critical it was for me to produce. Furthermore, because my work of feeding the world was so important, they even stopped calling me a farmer. I was now recognized as a producer. In industry's eyes, my sole purpose was to produce, and certainly not to be concerned with how my product was used once it left my farm. I've got 9 billion people to feed—how could I possibly question the judgment of industry? Especially when their representatives drive new pickups, wear clean clothes, have college degrees and give me free things?

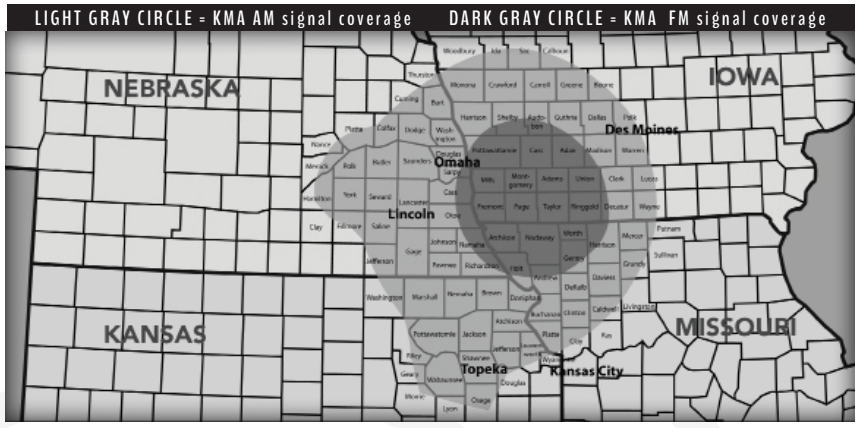
All the solutions seemed acceptable, except for one thing: seeing a shivering baby calf trying to nurse a muddy udder on a cold March day. This never felt right to me. On March 11, 1998 a severe blizzard stuck. I made it through, but it was something I never wanted the cows, calves, or myself to experience again. Instead of asking how I should deal with the problems caused by the blizzard, I asked: Why was I working against Mother Nature instead of with her? As I contemplated that question I decided to trust my gut; baby calves aren't supposed to be born in cold rotten weather. Calves are supposed to be born on warm spring days with lush green pastures. From that point forward, I decided my focus would no longer be on production. My focus would be on having clean water, healthy soil and happy cows.

The following summer I executed a significant change to my system. I didn't turn the bulls out till July 4th, meaning our first calves would arrive in mid April. Systems thinker Barry Dunn describes my actions this way, "Only a few high leverage interventions are needed for a large system change."3 With this intervention, something unexpected started to happen. My production increased, my costs decreased and my profits went up. Making a happy cow is actually a wonderful system. It requires clean water, which means restraining the cows from ponds and riparian areas. The clean water delivers higher weaning weights and better herd health. The restricted areas become habitats for birds and other wildlife. The birds like to eat the flies that bother the cows. Next, happy cows like diverse forage. They don't like one kind of grass—they like forbs, clovers and multiple species of grass. Clover and forbs don't like broadleaf herbicides, but at $40 an acre for broadleaf control, neither do I. Guess what else? The clover dilutes my fescue grass and provides better performance for the cows eating it. In addition, since clover is a legume it has reduced my reliance on commercial nitrogen. It also has played a nice role in the antler growth on our southwest Iowa whitetail deer.

What have I done? I've transitioned from a linear cause and effect system that was sustained by cheap crude oil and industry rhetoric to a system that is starting to follow nature's lead. It is a system that is starting to go beyond sustainable to a system that is actually regenerative. Ultimately, I think the greatest part of systems thinking is that it has given me a renewed sense of purpose. It has helped me remember that I'm not a "producer." I'm a farmer. My job isn't to produce. My job is to care for the land. When I do this properly, the land takes care of us all.

References 1 Laszlo, E. (ed. 1972). The relevance of general systems theory: Papers Presented to Ludwig von Bertalanffy on His Seventieth Birthday. Braziller. New York, New York. 2 A Systems Approach to Beef Improvement Barry H. Dunn, SDSU & Jennifer J. Johnson, Texas A&M – Kingsville. 3 Beef Magazine "Its all about relationships" Joe Roybal, Barry D

KMA LAND
960 AM & 99.1 FM



We Can Connect YOU with Our Listeners

- Age 35+ overall audience.
- 58% of the population of our geographic coverage area is age 35+ U.S. *Census Bureau*
- Age 45+ core audience
- Higher than average disposable income.
- The over age 50 population has tremendous buying power.
- Fastest growing population in the U.S.
- Someone reaches age 50 every seven seconds in the U.S. *Census Bureau*

Why KMAland Listens

- News and information that is about KMAland and its people, places, events, happenings
- Relevant, entertaining dependable delivery of that information
- TWO stations with the power of our heritage AM station PLUS a 100,000 watt FM Signal
- Extensive farm programming.
- Sports leader. Kansas City Royals, college football and basketball and extensive high school coverage of football, basketball, wrestling, track.
- Elephant Shop call-in buy, sell , trade show

Listener Research

The 2014 Ag Media Research (AMR) report ranks KMA AM-FM at the #1 choice of rural listeners with an overall 80.9 cume rating in our nine county Iowa primary coverage area. A full-time Ag Service Director delivers more than 25 hours of ag programming each week.

www.KMAland.com

Don't forget the power of our other audience through our website. DOUBLE the impact of your advertising efforts with an affordable digital ad that makes it easy to link to your FULL business story.

Information on our website is updated multiple times each and every day. This contributes to why we average over 172,774 unique visitors per month (up 22% over 2015), you can't afford to leave this connection with KMAland out your advertising plans.

WEED WARS FOR AN Organic Farmer

Ron Rosmann
Harlan, Iowa

"Weed Wars" for an organic farmer are an on-going phenomena and it seems to be a war that never ends. We certainly have that in common with the bulk of farmers who use herbicides as well. However, we use "different tools in the tool box" than they do, of course.

For a variety of reasons, we stopped using pesticides of all kinds in 1983. It was the early 80's and we were in the middle of the developing farm crisis years like most other farmers. I did not like handling chemicals as I always seemed to get some on my hands no matter how hard I tried to prevent it. It was nearly impossible to unplug nozzles without taking your gloves off. We also knew it could save money. I learned the skills of mechanical cultivation while growing up so could appreciate its value for weed control. On our farm of 400 acres at the time, I never abandoned the time-honored practices of diversified crops and livestock. I still grew oats, hay, and pasture unlike other farmers who abandoned that crop rotation back in the 70's when corn and soybeans came to the forefront. We had a farrow-to-finish hog operation and a stock cow herd. Our family (my wife Maria and I, and two of our three sons-David and Daniel) now farm 700 acres, all USDA certified organic. We maintain a cow herd of 100+ Red Angus cows and a farrow-to-finish hog operation of 65 sows. All our livestock is certified organic and we have our own meat label known as "Rosmann Family Farms." Some of the beef and pork is also sold to the organic cooperative "Organic Valley," based in Wisconsin.

What I know about weed control has come through trial and error, from other farmers, and through the organization Practical Farmers of Iowa. I had the privilege of being a founding board member. Our founding group of farmers, maybe 100 or so in Iowa, (we now have 3500+ members!) all shared in the goal of reducing pesticides and fertilizer without sacrificing yields and profit. We began doing randomized, replicated trials with the help of Iowa State University on how to accomplish that. At the time, many farmers were interested in ridge-tillage and the banding of herbicides and fertilizers. This proved to be a very effective way of reducing both herbicides and fertilizers without sacrificing any yield.

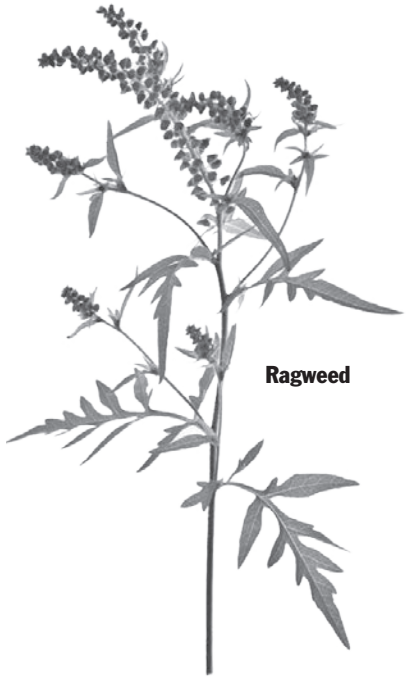
Continued to page 46

Continued from page 45

A few of us began to experiment with ridge-till and no-herbicides. I did four different trials over the years comparing ridge-tillage with no herbicides to conventional tillage with disking and no herbicides. This was done with soybeans in the years of 1988, 1989, 1997 and 2007. The results were essentially the same every year. There were always five to seven times more broadleaf weeds in the disked strips then in the ridge-till strips. All broadleaf weeds were hand counted. Grasses were not counted. Grasses were all but eliminated in the ridge-till strips. This was due to not stirring the ground up and not compacting the soil as the disking did. This made a believer out of me that ridge-till was probably the best tillage system for me to control weeds in our organic operation.

Jump forward to 2017. We still use ridge-till as our preferred tillage system for organics. Over time and with our changing weather, we are facing new challenges in our weed wars. Giant ragweed has become our toughest weed to control. It seems some of this has to do with the cold, wet springs we have had for many years now. The ragweed gets an early start and is hard to take out with the wide sweep and disk coulters on our planter. We have modified the planter quite a bit but still some are able to sneak by. Some also can get by the Buffalo cultivator. We do two cultivations with our Buffalo cultivators and two rotary hoeing passes in soybeans. We usually only do one rotary hoeing in corn and two cultivations. The late wet springs have made it a challenge to get through all of our corn twice with cultivation. We usually have 350-370 acres of corn and soybeans. With good organic prices for corn and soybeans, we have begun to have our worst fields walked by a crew of workers so that we can begin to reduce the weed seed bank. We will stop doing that when and if we are successful. (It is worth noting that some conventional farmers are beginning to have their soybeans walked for weeds.) Some are using mechanical cultivation as well as a tool to deal with resistance and the higher costs of increased herbicide applications.

Giant ragweed is becoming a much tougher weed to control when using herbicides as well. It is becoming enough of a problem that the University of Minnesota and the Iowa State University Leopold Center for Sustainable Agriculture are doing research on how to deal with this weed. Some of this problem has to do with developing resistance to chemicals. It seems to be one of those emerging "super weeds". On our farm, we are changing our crop rotation scheme in our difficult fields. We have been experimenting with two years of small grains, followed by at least two-three years of hay to reduce weed seed viability. Research is showing that giant ragweed seed only remain viable for about 5-6 years and lose viability at a fairly high rate every year. If we can have zero ragweed going to seed for at least four to five years, then we will start winning that war, we think. We have already noticed some positive results. This is where we have planted a fall crop of winter rye after soybeans and then harvested the rye for seed or feed the next year. That is followed by a planting of millet to be cut for hay. The third cover crop is that of oil seed radish and turnips or some other cover crop for grazing. The following spring means planting that field to small grains such as oats or succotash (oats, wheat, barley and field pea combination for swine rations). This is followed by at least two years of alfalfa/red clover hay and orchard grass. There are many different cover crops that one could use to fight this war.



Ragweed

I now view weeds differently compared to my first ten years of farming after graduating from ISU with a degree in Biology. I used to want to have perfectly clean fields, too. Now I just want to have effective weed control that does not decrease yields and profit. Fields without one single weed seems to me to be an unrealistic goal. This is especially true when you consider a plant's ability to mutate and adapt for self-survival. I also question this goal because of water and soil quality issues as well as having increasing pesticide residues in the food that we eat. I believe a return to banding of pesticides and fertilizers would go a long way in coming to grips with this "weed war".

BUILD YOUR OWN TRACTOR PACKAGE

1025R Tractor
$179.00
Per Month!

$45.00 per Month!

H120 - Loader

$32.00 per Month!

647 - Rear Tiller

$38.00 per Month!

60D - Mower Deck

$13.00 per Month!

BB2048 - Box Scraper

$7.00 per Month!

RB2060L - Rear Blade

Front Blade $19.75 per Month!

54 - Front Blade

0% FOR 72 MONTHS

$0 Down

*SOME RESTRICTIONS MAY APPLY.

Other Attachment Options:

Canopy - $7 per month
Imatch Quick Hitch - $5 per month
Rear Hydraulic Kit - $13 per month
Aux Rear Work Light - $1 per month

JOHN DEERE | AGRIVISION EQUIPMENT GROUP

Clarinda	Creston	Hamburg	Lenox	Leon	Macedonia	Massena	Pacific Junction	Red Oak	Winterset
(712) 542-2106	(641) 782-7032	(712) 382-1862	(641) 333-2288	(641) 446-4512	(712) 486-2441	(712) 779-2228	(712) 622-8217	(712) 623-4858	(515) 462-3115