



## Corn and Sorghum Update 2017

- Enlist Duo
- Acuron
- Acuron Flexi
- Diflexx Duo
- Resicore
- Kochiavore
- Kochia management – now
- Inzen sorghum – Zest WDG
- Huskie following PRE applied Lumax and Lexar

## Atrazine issues AGAIN!

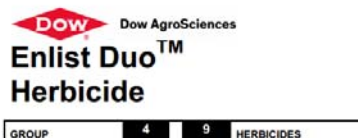
- Complete EPA review, Timeline 3 yrs!  
Outcomes?
  - Cancel registration, very unlikely
  - Change labeled rates and total annual rates, likely
  - Alter current uses, very possible
  - Add additional restrictions, very possible
- Off target movement
  - Atrazine is safe but finding atrazine in ground and surface water, increases the overall problem!
  - Need to be good stewards with atrazine use

## Best Management Practices for Atrazine

KSU publication MF-2182

- Incorporation reduces losses 67%
- Apply atrazine prior to April 15, reduce losses 50%
- Split applications, 2/3 rate in March and remainder after planting. Reduce losses by 33%
- Use to low atrazine rate PREmixes. Ie “Lite” formulations
- Use POST vs PRE applications of atrazine. Lower rates used POST. Can reduce losses by 67%
- Reduce PRE atrazine rates to 1 pound or less followed by POST 0.5 lb if needed. Combined applications improve control.
- Use other herbicides without atrazine. Can reduce losses by 100%
- Vegetative filter strips reduce flow rate and reduce losses by 50%
- Buffer zones. Avoid applications near water sources and environmentally sensitive areas.

Herbicide registered for corn and soybean, and cotton



Continue to wait for foreign trade approvals. China primarily.

## Enlist Duo Herbicide for Enlist Corn Hybrids

- Enlist Duo received full Federal Label in November of 2014. Still WAITING for foreign export approvals (China) of corn produced from Enlist hybrids.
- Contains 1.7 lbs glyphosate acid and 1.6 lbs of 2,4-D ae.
  - Colex-D technology: Dimethylamine salt of glyphosate and a choline salt of 2,4-D.
- Use 3.5 to 4.75 pts /acre to corn no larger than V8 or 30 inches tall.
- Make 1 to 2 post applications with a minimum of 12 days between applications.
- May be used PRE or POST, however, total application can not exceed 14.25 pints of Enlist Duo / acre / use season
- DO NOT aerially apply Enlist Duo

**Acuron** For corn (grain or silage), Syngenta

- Atrazine 1.0 + bicyclopyrone 0.06 + mesotrione 0.24 + S-metolachlor 2.14 lb/gallon
- Use rate 2.5 qt on soils < 3% OM and 3 qt on 3% OM or more with a maximum of 3 qt / year.
- Apply from 28 days prior to planting to 11 (prior to 12) inch tall corn.
- If applied POST to corn and weeds, used NIS at 0.25% v/v. COC can be used up to 1% v/v but will increase the risk of crop injury. DO NOT use MSO, AMS, or UAN.

**Acuron Flexi** For corn (grain, silage, seed, sweet, and yellow pop), Syngenta

- Bicyclopyrone 0.08 + mesotrione 0.32 + S-metolachlor 2.86 lb/gallon
- Use rate 2.0 qt on soils < 3% OM and 2.25 qt on soils with 3% OM or more with a maximum of 2.25 qt / year.
- Apply from 28 days prior to planting postemergence from emerged to 30 inches tall or up to the 8-leaf stage on field, silage, and seed corn only.
- If applied POST to corn and weeds, used NIS at 0.25% v/v. COC can be used up to 1% v/v but will increase the risk of crop injury. DO NOT use MSO, AMS, or UAN. Do not apply postemergence to sweet or pop corn!

**DiFlex Duo (Bayer Crop)** for all Corn and in fallow

- Diglycolamine salt of dicamba 1.86 lb ae/gal + Laudis 0.27 lb/gal+ Safener - This CSA safener has soil and foliar activity
- Use 24 to 49 fl oz/A may be applied preplant, preemergence to field, silage, seed, and pop corn up through V7 stage. With drop nozzles can be applied up to corn at the V10 stage or 36 inch tall.
- At MSO or COC at 1% v/v when applied alone or tankmixed with atrazine.
- AMS or UAN is recommended in the label.
- **NOTE the addition of AMS or UAN will increase the risk of dicamba volatility!**

**Weed management in Irrigated corn with DiFlex Duo, 2016, 1609cornTR, Thompson and Schlegel. ALL POST!**

Treatment	Rate	Yield	Palmer	kochia	VELE	LSSBur
	Prod. / acre	Bu/a	% control 7 wks after POST			
DiFlex Duo (DD) + atra +Destiny HC+AMS	24 fl oz+ 1 pt+ 1% v/v + 8.5 lb	192	96	100	99	35
DD+atra+Destiny HC+AMS	32 fl oz + 1pt+ 1% v/v+8.5 lb	195	96	100	99	39
DD+RPM+atra+Destiny HC+AMS	24+32 fl oz+ 1pt+ 1%v/v + 8.5 lb	203	91	98	100	86
DD+Liberty280+atra+Destiny HC+AMS	24+22 fl oz+ 1pt+ 1%v/v + 8.5 lb	198	96	100	100	41
Capreno+RPM+atra+Superb HC + AMS	3 fl oz + 32 oz +1pt +0.5% + 8.5 lb	211	96	99	100	90
Halex GT + atraz + NIS + AMS	3.6 pt+ 1 pt+ .25% + 8.5 lb	208	100	98	100	92
Armezon + atra +Status + NIS + AMS	0.57 oz + 1 pt+ 3 oz + .25% + 8.5 lb	198	94	90	100	51
Armezon + atra +Status + RPM+ NIS + AMS	0.57 oz + 1 pt+ 3 oz + 32 +.25% + 8.5 lb	204	95	96	100	96
Armezon + atra + RPM + Outlook + RPM+ NIS + AMS	0.57 oz + 1 pt + 32 + 14oz +.25% + 8.5 lb	209	98	97	99	94
LSD 0.05		16	4	3	1	14

**Resicore (Dow AgroSciences)** for all Corn

- Acetochlor (15) 2.8 lb/gal + mesotrione (27) 0.30 lb/gal + clopyralid (4) 0.19 lb ae/gal
  - Rates are 2.25 to 3.0 qt/a PRE to field, silage, seed, and popcorn 28 days before planting up to emergence
  - Used at 1.5 to 3.0 qts/acre to field, silage or seed corn early post up to corn 11 inches tall
- Add NIS at 0.25% v/v or COC up to 1% v/v to enhance postemergence activity. Do not use MSO or adjuvants containing nitrogen if corn has emerged. The exception is 1.5 qts of Resicore may be applied postemergence with glyphosate (on glyphosate resistant corn) or glufosinate (on Liberty Link corn) and AMS at 8.5 lb/100 gallon + NIS at 0.25% v/v.

**Weed management in corn with PRE herbicides, Ashland Bottoms, Manhattan KS, 2016, 1605corn, Thompson and Peterson**

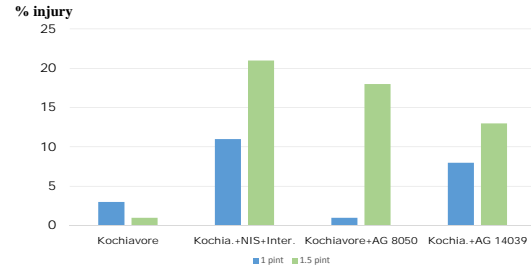
Treatment	Timing	Rate	Cost	Yield	Palmer	Vele	Mogy
		Prod. / acre	\$/a	Bu/a	% control, July 14, 70 DAA		
Acuron	Pre	2.5 qt	46.50	157	98	100	96
Acuron Flexi	Pre	2 qt	46.40	159	95	98	80
Zemax	Pre	2 qt		151	93	97	71
Resicore	Pre	2.5 qt	44.30	151	98	98	92
Resicore+atrazine	Pre	2.5 + 0.63 qt	46.50	168	94	100	96
SureStart II	Pre	1.25 qt	34.25	146	95	38	69
SureStart II +atrazine	Pre	1.25 +0.63 qt	36.45	148	98	35	76
Degree Xtra	Pre	3 qts	37.00	138	97	47	82
Corvus	Pre	5.6 fl oz	42.40	140	97	100	56
Corvus+atrazine	Pre	5.6 fl oz + 0.63 qt	44.60	148	96	100	64
Verdict	Pre	15 fl oz	28.40	158	96	81	88
Verdict+atrazine	Pre	15 fl oz + 0.63 qt	30.60	154	97	83	84
Untreated				22	-	-	-
LSD (0.05)				24	7	16	8

Pre's = May 5

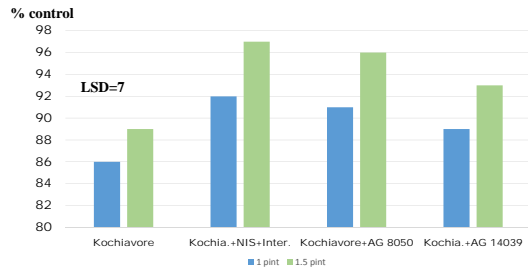
### Kochiavore, Winfield Solutions

- 2,4-D LV 1.67 ae lb, bromoxynil 1.67 lb, & Fluroxypyr 0.67 ae lb/gallon
- Broadleaf weed control including kochia.
- Use 1 to 1.5 pints in corn Preplant, minimum of 7 days ahead of planting, or post plant preemergence to nofill planted corn, or postemergence, v3 to v5. Postemergence to grain and forage sorghum v4 to the pre-boot stage. Kochiavore will cause crop injury. Can be applied up to 2.5 pints on fallow. Maximum is 3 pints/a for growing season.
- Do not feed or graze corn for 47 days following application or harvest grain for 90 days of application. Do not harvest grain within 70 days of application or allow meat or dairy animals to consume fodder, forage, or graze for 45 days following application to sorghum. Do not allow livestock to grazed fallow that has been treated with Kochiavore.

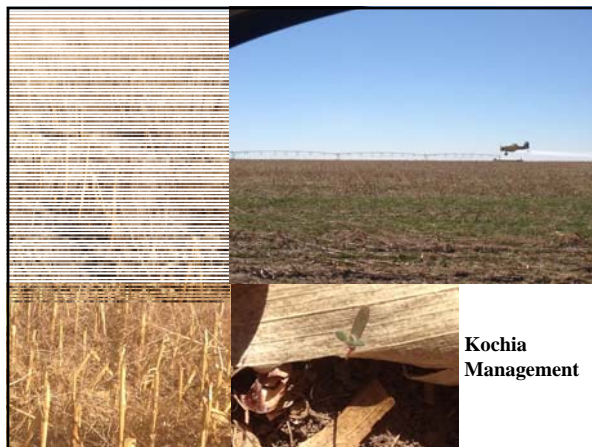
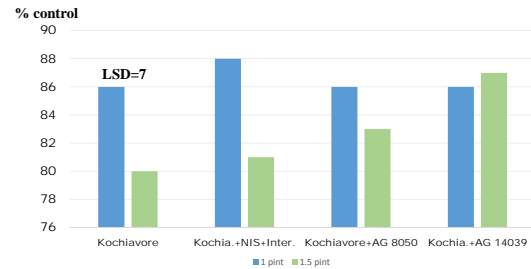
### Crop injury 4 weeks after post applications, Tribune KS. Thompson, Schlegel, and Peterson. 1613cornTR.



### Kochia control 4 weeks after post applications, Tribune KS. Thompson, Schlegel, and Peterson. 1613cornTR.

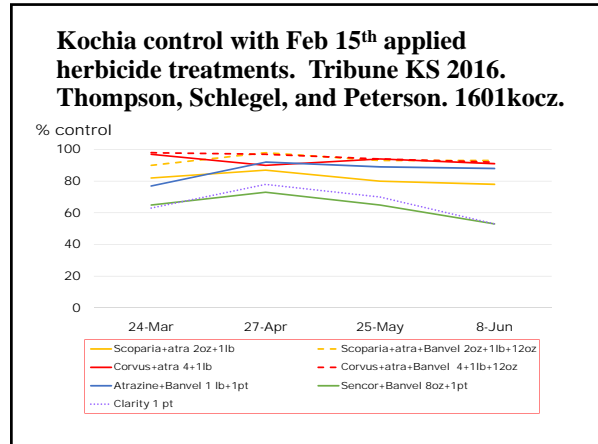
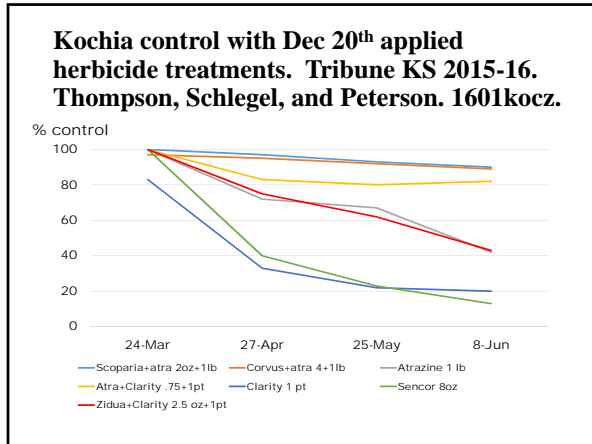


### Palmer amaranth control 4 weeks after post applications, Tribune KS. Thompson, Schlegel, and Peterson. 1613cornTR.



### Controlling kochia with PRE herbs.





### Inzen Z sorghum development

- ALS resistant sorghum lines were developed at KSU
- ALS resistant shattercane from SW Kansas was crossed with grain sorghum lines (Tuinstra and Al-Khatib)
- Several ALS resistant lines were distributed by K-State to all sorghum breeding programs
- Currently Pioneer and Advanta have agreements signed with DuPont (Owner of this new technology) and will produce & market hybrid Inzen Z sorghum

### Zest WDG (DuPont) for Inzen sorghum

- Nicosulfuron 75% WDG, 0.67 to 1.33 oz prod./a
- 0.25 to 0.5% v/v NIS or 1% v/v COC
- 2 qt/a UAN or 2 lb/a AMS
- Apply to sorghum 5 collar to flagleaf visible, 4 to 20 inch sorghum.
- Annual grass control varies with species and size of the grass at application.
- Start with an effective PRE applied herbicides.
  - Zest should be the second part of a two pass system.

### Maximum grass species height

WEEDS CONTROLLED IN INZEN™ GRAIN SORGHUM

Weeds controlled with 0.67ounces (0.032 pounds of nicosulfuron active ingredient) ZEST™ WDG herbicide.

Grasses	Maximum Height or Diameter
Barnyardgrass <sup>†</sup>	4"
Broadleaf signalgrass	2"
Crabgrass (large) <sup>†</sup>	2"
Foxtails (bristly, giant <sup>†</sup> , green <sup>†</sup> , yellow <sup>†</sup> )	4"
Ischaemum	6"
Panicum (Texas, browntop)	3"
tall	4"
Ryegrass (Italian, perennial) <sup>†</sup>	6"
Sandbar (field, longspine) <sup>†</sup>	3"
Wild oat <sup>†</sup>	4"
Wild proso millet	4"
Witchgrass	6"

<sup>†</sup> Naturally occurring resistant biotypes are known to occur. If weed escapes occur, treat with an herbicide having a mode of action other than Group 2 and/or use non-chemical methods to remove escapes, as practicable, with the goal of preventing further seed production.  
<sup>\*</sup> Refer to Specific Weed Instructions Section of this Label

### Zest WDG Restrictions

- Can be tankmixed with 2,4-D LV, dicamba, atrazine, Starane Ultra, and Ally XP, 1/20 oz.
- **DO NOT USE COC** when tankmixing 2,4-D or dicamba.
- **DO NOT tankmix with Huskie herbicide** as significant grass antagonism may result.
- Rotation back to sorghum is 18 months
  - **NOT CONTINUOUS SORGHUM!**

### Zest WDG Rotation Restrictions

The following rotational intervals should be observed when using ZEST™ WDG at a maximum of 1.33 ounces:

#### ZEST™ WDG ROTATIONAL CROP GUIDELINE - 1

No soil pH restrictions

Rotational Crop	Interval in Months
Corn (field, sweet)	Anytime
Corn (pop, sweet)*	10
Soybeans	0.5 (15 days)
Cereals, spring (barley, oats, rye, wheat)	8
Cereals, winter (barley, oats, rye, wheat)	4
Cotton	10
Dry Beans, Peas, Snap Beans	10
Alfalfa**	12
Red Clover**	12
Sorghum (All types including hybrids containing the INZEN™ trait)	18

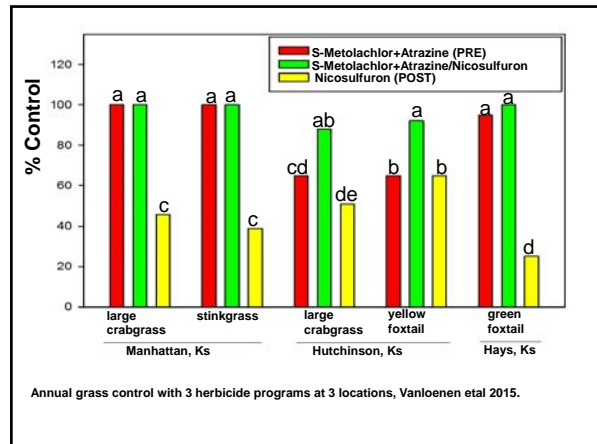
Other Crops See Rotational Crop Guidelines 2 and 3  
 \* Except for the sweet corn varieties "Merf", "Carnival", and "Sweet Success", for which the minimum time interval is 15 months.  
 \*\* Except for the state of Kansas east of Highway 75, for Minnesota east and south of the Red River Valley and for the states east of the line formed by the western borders of Iowa, Missouri, Arkansas, and Louisiana, where the minimum time interval is 10 months.

#### ZEST™ WDG ROTATIONAL CROP GUIDELINE - 2

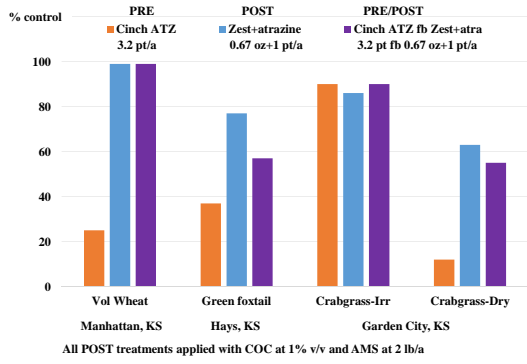
With soil pH < 7.5 restrictions

Crop	Rotational Interval in Months
Sunflowers	pH 7.5 11** pH > 7.5 18

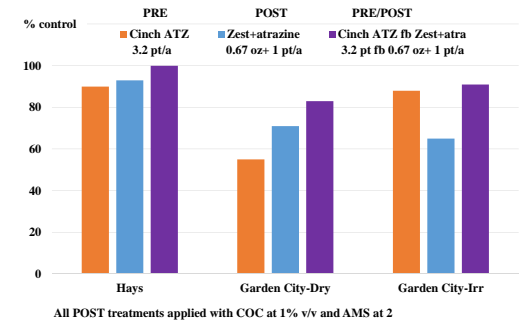
All other crops not listed in Rotational Guidelines 1 or 2 See Rotational Guideline 3  
 \* Except in Texas and Oklahoma east of Highway 281, where the rotational interval is 10 months, regardless of pH.  
 \*\* Precipitation following application must exceed 14" prior to planting sunflowers.



### Vol. wheat, foxtail and crabgrass control with single and two pass herbicide programs. Vanloenen, Thompson, Stahlman, and Currie, 2016.



### Palmer amaranth control with single and two pass herbicide programs. Stahlman et al. and Currie et al. 2016



Yield potential of test cross hybrids resistant to ALS inhibitor herbicides as compared to commercial checks, 2015. Tesfaye Tesso and his group, Agronomy Department, K-State.

Entry	bu/acre	Yield as % of the top check
PR14/15-119 x PR14/15-199	132	101
PR14/15-143 x PR14/15-241	122	93
PR14/15-103 x PR14/15-175	134	103
PR14/15-149 x PR14/15-190	128	98
PR14/15-105 x PR14/15-181	134	103
PR14/15-119 x PR14/15-199	131	100
PR14/15-121 x PR14/15-190	122	93
PR14/15-121 x PR14/15-197	126	97
PR14/15-157 x PR14/15-217	119	91
Pioneer 84G62	130	-
Dekalb 54 00	129	-

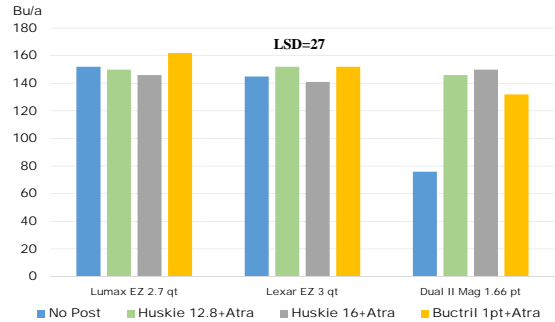




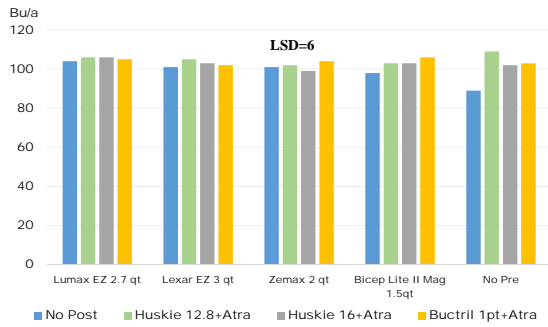
### Statement from the Huskie label

- Unacceptable crop response may occur if Huskie Herbicide is applied to acreage that has been previously treated with an application of any product containing mesotrione (products such as Lumax or Lexar).

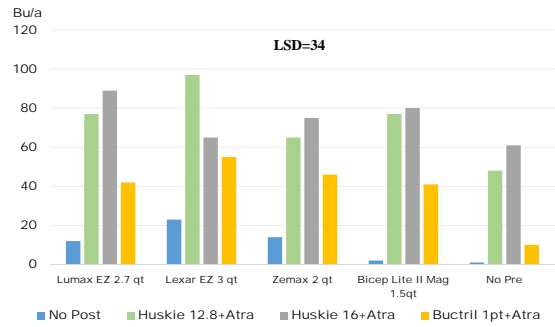
Effect of Huskie on sorghum previous treated with PRE applied mesotrione products, Ashland Bottoms 2015. Menzer, Thompson, Jugulam, and Peterson.



Effect of Huskie on sorghum previous treated with PRE applied mesotrione products, SWREC Tribune. Menzer, Thompson, Schlegel and Peterson 2016.



Effect of Huskie on sorghum previous treated with PRE applied mesotrione products, Ashland bottoms, Manhattan. Menzer, Thompson, Jugulam, and Peterson 2016.



SRP1132 2017 Chemical Weed Control for Field Crops

www.bookstore.ksre.ksu.edu/pubs/chemweedguide.pdf

**SEARCH:**  
 "2017 Chemical Weed control for Field Crops"  
 or  
 "KSU SRP1132"

Briefly discuss features that will help you choose your herbicide program.

Over 95% of questions asked, can be answered from this guide.

However, this isn't a substitute for the herbicide label.

# Questions?

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