

# **ZOZI** SEDGUDE

# CORN

#### Let's leave status quo in the dust.

It's time to tune out all the bluster and focus on what works. CROPLAN® by WinField United gives you the right tools to make the best agronomic decisions for your corn crop. CROPLAN® seed uses the latest data to recommend what hybrids to choose and where to place them to get optimal bang for your buck. And we're one of the only seed brands in the industry to offer zinc as a standard treatment on all commercial hybrids to promote early-season growth and root development. We'll work with you to determine how much, when and where to apply nutrients and crop protection products to generate the most yield and profit potential. Our expertise leads. And it yields.

#### **KEY TAKEAWAYS**

- 1 Be familiar with hybrid response to continuous corn (RTCC) and soil type.
- Optimize yield potential by understanding hybrid response to population (RTP).
- 3 Use hybrid response-to-nitrogen (RTN) scores to maximize your nitrogen management plan.
- 4 Understand hybrid ROI potential with fungicide applications by knowing the response-to-fungicide (RTF) score.
- Use quality data from WinField United to make informed decisions.

#### RESPONSE-TO SCORES DELIVER RESULTS YOU CAN HARVEST<sup>1</sup>

Nine years of nationwide Answer Plot<sup>®</sup> data show that there is a **+97.6-bushel-per-acre average response** over the four different response-to scores (response to continuous corn, response to population, response to nitrogen, response to fungicide). By using response-to scores to choose hybrids that fit specific management conditions, there are potentially 97.6 bushels per acre at stake, with a range of 43 to 203.9 bushels per acre across the four input decisions.

Response to (	Cont. Corn	Response to Population
14.4 B	U/A	8.5 BU/A
Range: 5.8 to	36.7 bu/A	Range: 0.84 to 21.9 bu/A
Response to	Nitrogen	Response to Fungicide
66.7 B	U/A	14.3 BU/A
Range: 30.8 to	104.9 bu/A	Range: 5.6 to 40.4 bu/A

#### **MAKE CONTINUOUS CORN COUNT<sup>2</sup>**

All hybrids have strengths and weaknesses that must be considered when determining how they will respond under different cropping systems and on various soil types.

 Matching hybrids to your cropping system will allow you to achieve optimal yield potential. Good management of residue, insects and disease in addition to vigilant scouting are all critical to sustaining an optimal corn-on-corn system.  For good emergence, plant corn at uniform depths and position stronger-emerging hybrids on continuous-corn fields with heavy residue.

RTCC Average Response – 14.4 bu/A

#### TARGET POPULATIONS<sup>2</sup>

Planting each hybrid at the right population is key to optimizing its performance potential. A high RTP score identifies a hybrid that shows a potential yield gain with increased populations. A low RTP score indicates a hybrid that does not deliver high yield potential with increased populations.

#### RTP Yield Response Variance – 11.7 bu/A



#### LET NITROGEN NOURISH<sup>2</sup>

Be sure to consider the RTN scores of the hybrids you choose. Select hybrids with high RTN scores if you are planning to apply additional or late-season nitrogen, and hybrids with moderate or low scores in limited nitrogen environments. Perform appropriate tissue testing to determine optimal application timing for nitrogen, which may help minimize the financial and environmental costs of applying too much.



#### LEVERAGE FUNGICIDES FOR PLANT HEALTH<sup>2</sup>

Fungicides are another tool to help you optimize the yield potential of your corn crop. RTF scores help you understand where fungicides may increase yield potential and protect ROI potential.



#### **TURN DATA INTO INSIGHTS**

Trusted WinField United advisors help you connect various data sources, analyzing and interpreting different data sets to make personalized recommendations for your farm to achieve more yield and profit potential.



Answer Plot<sup>®</sup> Locations Exceptional Data Accuracy (low LSDs)

 Response ranges show the importance of how hybrids respond to each management practice to help ensure the highest yield potential. 2019 nationwide Answer Plot<sup>®</sup> data. Because of factors outside of WinField United's control, such as weather, product application and any other factors, results to be obtained, including but not limited to yields, financial performance or profits, cannot be predicted or guaranteed by WinField United.
 2019 Answer Plot<sup>®</sup> trial data.
 1998–2019 Answer Plot<sup>®</sup> trial data.

# CORN

#### **CROPLAN®** TRAIT LETTERING FOR CORN HYBRIDS

Descriptive hybrid numbering and trait lettering systems are used for CROPLAN  $^{\scriptscriptstyle (\! 8)}$  corn hybrids.

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KEY	HYBRID	TRAIT	LOGO
SS	SmartStax <sup>®</sup> ; GENSS	YieldGard VT Rootworm, Herculex <sup>®</sup> RW, YieldGard VT PRO <sup>®</sup> Corn Borer and Herculex <sup>®</sup> protection, Roundup Ready <sup>®</sup> 2 Technology and LibertyLink <sup>®</sup>	SmartStax
SS/RIB	SmartStax <sup>®</sup> RIB Complete <sup>®</sup> Corn Blend; GENSS	5% RIB, YieldGard VT Rootworm, Herculex <sup>®</sup> RW, YieldGard VT PRO <sup>®</sup> Corn Borer and Herculex <sup>®</sup> protection, Roundup Ready <sup>®</sup> 2 Technology and LibertyLink <sup>®</sup>	
VT2P	VT Double PRO <sup>®</sup> ; GENVT2P	YieldGard VT PRO <sup>®</sup> Corn Borer protection, Roundup Ready <sup>®</sup> 2 Technology	<b>√T</b> Doublep <u>R0</u> °
VT2P/RIB	VT Double PRO <sup>®</sup> RIB Complete <sup>®</sup> Corn Blend; GENVT2P	5% RIB, YieldGard VT PRO <sup>®</sup> Corn Borer protection, Roundup Ready <sup>®</sup> 2 Technology	
RR	Roundup Ready <sup>®</sup> Corn 2; RR2	Roundup Ready <sup>®</sup> Corn 2	Roundup Ready: CORN
DGVT2P	DroughtGard <sup>®</sup> VT Double PRO <sup>®</sup> Corn Blend	DroughtGard <sup>®</sup> YieldGard VT PRO <sup>®</sup> Corn Borer protection, Roundup Ready <sup>®</sup> 2 Technology	DroughtGard HTBRIDS VTDoublegenor
DGVT2P/RIB	DroughtGard <sup>®</sup> VT Double PRO <sup>®</sup> RIB Complete <sup>®</sup> Corn Blend	5% RIB, DroughtGard <sup>®</sup> YieldGard VT PRO <sup>®</sup> Corn Borer protection, Roundup Ready <sup>®</sup> 2 Technology	DroughtGard HIBRIDS VTDoubleg.ppg
AS3000GT	Agrisure <sup>®</sup> 3000GT	$Agrisure^{\circledast}$ Corn Borer and Rootworm protection, Glyphosate Tolerant and LibertyLink^{\circledast}	Agrisure LIBERTY 3000GT LINK W
AS3011A	Agrisure Artesian® 3011A	Agrisure Artesian $^{\circledast}$ and Agrisure $^{\circledast}$ Corn Borer, Rootworm, Glyphosate Tolerant and LibertyLink $^{\circledast}$	
AS3111	Agrisure Viptera® 3111	Agrisure $^{\circledast}$ Corn Borer, Rootworm and Broad Lepidopteran protection, Glyphosate Tolerant and LibertyLink $^{\circledast}$	
GT	Agrisure <sup>®</sup> GT	Agrisure® Glyphosate Tolerant	AgrisureGT
AS3122-EZ	Agrisure <sup>®</sup> 3122 E-Z Refuge <sup>®</sup>	Agrisure <sup>®</sup> E-Z Refuge <sup>®</sup> , Agrisure <sup>®</sup> Glyphosate Tolerant, Agrisure <sup>®</sup> Corn Borer and LibertyLink <sup>®</sup> , Agrisure <sup>®</sup> Rootworm Protection and Herculex <sup>®</sup> XTRA <i>Insect Protection</i>	Agrisure 3122 E 2 Refor
AS3220-EZ	Agrisure Viptera <sup>®</sup> 3220 E-Z Refuge <sup>®</sup>	Agrisure Viptera <sup>®</sup> , E-Z Refuge <sup>®</sup> , Corn Borer, Glyphosate Tolerant and Herculex <sup>®</sup> I <i>Insect Protection</i>	Agrisure Viptera szot-Zwinge
AS3220A-EZ	Agrisure Viptera <sup>®</sup> 3220A E-Z Refuge <sup>®</sup>	Agrisure Artesian <sup>®</sup> , Agrisure <sup>®</sup> Corn Borer, Broad Lepidopteran protection, Glyphosate Tolerant and Herculex <sup>®</sup> I <i>Insect Protection</i>	





RTF

1

2

RTF

1

3 = Acceptable 4 = Manage

1 = Excellent

2 = Strong

5 = Not Recommended

from the genetics supplier and may change as additional data is gathered.

generated from Answer Plot® trials and/or

CROPLAN® corn silage hybrids that consistently perform for high-quality and high-tonnage in Answer Plot<sup>®</sup> trials.





Product descriptions and ratings are generated from Answer Plot<sup>e</sup> trials and/or from the genetics supplier and may change as additional data is gathered.

CROPLAN® corn silage hybrids that (interest consistently perform for high-quality and high-tonnage in Answer Plot® trials.



Agrisure Artesian<sup>®</sup> trait with excellent yield potential; handles variability and multiple soil types

- Medium-tall plant with strong stalks Low response to population for success at lower plant densities
- Acceptable Goss's wilt tolerance; slower drydown due to girthy cob and tight husk

#### **Characteristics**

HIGH

MODERATE

NO.

Seedling Vigor Drought Tolerance Root Strength Staygreen Stalk Quality Dry Down Test Weight





#### **Characteristics**

Seedling Vigor Drought Tolerance Root Strength Staygreen Stalk Quality Dry Down Test Weight

Not Re	comm	endeo	d Ex	cellent
				1
				1
			2	
		3		
		3		
			2	
			2	

#### CP2845SS/RIB [VT2P/RIB]\* Relative Maturity: 89 Days SmartStax **Response Scores** HIGH MODERATE LOW BTE RTP **BTN** High-yield-potential product for most soil types and environments Earlier flowering date and fast drydown High response to nitrogen; population optimizes yield potential · Manage placement for Goss's wilt **Characteristics** Not Recommended Excellent Seedling Vigor Drought Tolerance Root Strength Staygreen 3 Stalk Quality Drv Down Test Weight

#### KEY

Scale

1 = Excellent

4 = Manage 5 = Not Recommended

2 = Strong 3 = Acceptable

_	NEW	-	_	-			ቅ
CP2288VT2P/RIB*	CP2180VT2P/RIB*	CP2123VT2P/RIB*	CP184RR	CP1756VT2P/RIB*	RM: 77-89	SRAND ULINE ALE ALE ALE ALE ALE ALE ALE ALE ALE AL	
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		NEW					NEW			NEW				
CP2965VT2P/RIB*	CP2845SS/RIB*	CP2851VT2P/RIB*	CP2790VT2P/RIB*	CP2692AS3011A	CP2587VT2P/RIB*	CP2417VT2P/RIB*	CP2315VT2P/RIB*	CP2330VT2P/RIB*	CP2288VT2P/RIB*	CP2180VT2P/RIB*	CP2123VT2P/RIB*	CP184RR	CP1756VT2P/RIB*	CIN: 11-03
89	89	88	87	98	85	85	83	83	82	81	81	80	77	
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RED	RED	RED	RED	Red	RED	RED	RED	RED	RED	RED	RED	PINK	RED	
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Medium	Early	Medium	Early	Medium	Medium	Medium	Early	Medium	Medium	Medium-Early	Early	Early	Early	
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N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	



CROPLAN





Product Name	
Attributes	
Placement	
Product Name	_
Attributes	
Placement	
Product Name	-
Attributes	
Placement	
Product Name	-
Attributes	
Placement	



# SOYBEAN

# There's no good reason risk has to increase with yield.

We won't promise you the world. We will promise you an honest and insightful approach to maximizing your soybean yield potential. At WinField United, we use proven technologies to match the right soybean genetics and traits to your field's conditions. Plus, our CROPLAN® seed varieties are selected for disease tolerance that helps protect the soybean plant throughout all stages of growth. We know this is the best way to help you achieve optimal return on your seed and crop inputs.

#### 1 of 2

#### **KEY TAKEAWAYS**

- 1 Use appropriate trait technology to achieve effective weed control.
- 2 Introduce stability to your fields with CROPLAN® WinPak® soybean varieties.
- 3 Ensure optimal plant health at the start of the season with Warden<sup>®</sup> CX seed treatment.
- 4 Use the R7<sup>®</sup> Tool to help choose the right soybean varieties for your specific fields.
- **5** Select varieties for disease tolerance and manage them throughout the season.

#### MANAGE WEEDS WITH TRAIT TECHNOLOGY

CROPLAN® soybean seed offers the newest genetics with multiple herbicide trait options developed to effectively manage your weedresistance issues.



#### SOYBEAN HERBICIDE TOLERANCE AND WEED CONTROL

Weed control in soybeans starts with seed selection. With several herbicide-tolerant traits now available and more on the way with full commercial approval, the number of tools in the toolbox is increasing. But as you face hard-to-control weeds, creating a plan for season-long weed management is critical. The chart outlines the soybean herbicidetolerant varieties available today. These traits offer some great postemergence options.

	Glyphosate	Glufosinate	2,4-D Choline	Dicamba	HPPD Isoxaflutole
LIBERTYLINK®		Х			
LIBERTYLINK <sup>®</sup> GT27™	Х	Х			Х
ROUNDUP READY 2 YIELD®	Х				
<b>ROUNDUP READY 2 XTEND®</b>	Х			Х	
ENLIST E3®	Х	Х	х		

#### **REDUCE RISK WITH WINPAK<sup>®</sup> SOYBEAN VARIETIES**

WinPak<sup>®</sup> soybean varieties from CROPLAN<sup>®</sup> seed are a unique combination of two varieties that provide an exceptional level of stability throughout the field. Designed to address field variability, WinPak<sup>®</sup> varieties have excellent yield potential on productive acres along with the ability to handle the stress of performing on more challenging acres.

#### EXAMPLE OF HOW A WINPAK® VARIETY CAN BE FORMULATED

	VARIETY A EXAMPLE	VARIETY B EXAMPLE
PLACEMENT	Average to below-average yield environments.	Best-suited to productive acres.
DISEASE PACKAGE	Strong soybean white mold and iron deficiency chlorosis (IDC) tolerance.	Excellent phytophthora root rot and frogeye field tolerance.
AGRONOMICS	<ul><li>Narrow canopy type</li><li>Tall height</li><li>Excellent standability</li></ul>	<ul><li>Bushy canopy type</li><li>Medium height</li><li>Average standability</li></ul>
STRESS TOLERANCE	Excellent stress tolerance.	Strong stress tolerance.

▶ WinPak<sup>®</sup> varieties are designed to mitigate risk across the whole field by offering more stability on variable acres, delivering high yield potential on productive acres and maintaining consistency on more challenging acres. They also provide an enhanced disease and agronomic package for the whole farm.





#### PROTECT YIELD POTENTIAL WITH WARDEN® CX SEED TREATMENT

Guard high-value soybean seed from early-season disease and insect threats with Warden<sup>®</sup> CX seed treatment. In 2018, testing by an independent seed lab and the University of Minnesota Plant Disease Clinic indicated a positive response to soybean seed treated with Warden<sup>®</sup> CX seed treatment compared to an untreated control group. Compared to untreated seed, Warden<sup>®</sup> CX treated seed improved the warm germination test by 4.5% and the cold germination test by 27.6%.

#### AVERAGE GERMINATION IMPROVEMENT: WARDEN® CX VS. UNTREATED



#### **OPTIMAL CONDITIONS FOR DISEASE INFECTION**

FUNGUS	DISEASE	TEMPERATURE (F) Range/optimum	MOISTURE
Pythium	Damping-off	50°-68°/<59°	Saturated
Rhizoctonia	Damping-off	60°-86°/80°	30%-60% water
Phytophthora	Damping-off	59°-86°/77°-80°	Saturated; weekly periodic rain
Fusarium	SDS and root rot	50°-86°/59°	Wet to saturated

#### MANAGE IN-SEASON

Select your disease package based on field conditions.

- Knowing where yield potential is falling behind alerts you to disease and other potential threats, allowing you to make inseason adjustments.
- Satellite imagery highlights field variability and indicates where appropriate crop inputs might help optimize yield potential.
- Use R7<sup>®</sup> Tool satellite imagery to monitor plant health.





#### **CROPLAN®** TRAIT LETTERING FOR SOYBEAN VARIETIES

Descriptive variety numbering and trait lettering systems are used for  $\mathsf{CROPLAN}^\circledast$  soybean varieties.



KEY	VARIETY	TRAIT HERBICIDE TOLERANCE	LOGO
L	LibertyLink®	Liberty <sup>®</sup> tolerant	
LG	LibertyLink <sup>®</sup> GT27™	$Liberty^{\texttt{B}}$ and glyphosate tolerant	
RR	Roundup Ready 2 Yield®	Roundup <sup>®</sup> tolerant	Roundup 2 YIELD
X	Roundup Ready 2 Xtend®	Roundup® and dicamba tolerant	ROUNDUP READY 2 SOYBEANS
E	Enlist E3®	Glyphosate, glufosinate and 2,4-D choline tolerant	Enlist E3 Sojcenn
S	STS®	Sulfonylurea tolerant	N/A



SOUNDUP READY 2			
Characteristics	s		
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended    N/A   N/A   N/A	Excellent
Height	м	Canopy Type	Int
Stress Tolerance	N/A	Emergence	2
Standability	1		

CROPLAN	P0071	OX	
Gro	oup: <b>0.07 Da</b>	ys	
	WinPa	ak'	
Characteristic	s		
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended	Excellent
Height	М	Canopy Type	-
Stress Tolerance	N/A	Emergence	2
Standability	2		

WinPak<sup>®</sup> variety consisting of CP00777X and CP00711X

- Higher-yielding replacement for CP00700X
- Strong IDC tolerance with excellent standability

Grou		J L	
dibb	p. <b>0.07 D</b> a	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
eelistE)			
Characteristics			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended N/A Solution S	Excellen
Height	М	Canopy Type	Int
Stress Tolerance	2	Emergence	1
Standability	3		

- Early Enlist E3<sup>®</sup> soybean for Group 00 market Position north of Highway 2
- Strong SWM tolerance; acceptable IDC and PRR tolerance
- Best-suited for narrow rows



CROPLAN CP	<b>0092</b> p: 0.09 Da	<b>GX</b> ys	
ROUNDUP READY 2			
Characteristics			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended N/A 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Excellent 2 2
Height	м	Canopy Type	Int
Stress Tolerance	3	Emergence	1
Standability	3		
<ul> <li>Strong yield pot</li> <li>Broadly adaptive</li> </ul>	ential for e bean m	productive soils	

- Strong IDC and BSR tolerance
- Not recommended in SCN-prone areas

Gro	up: 0.2 Days		
	WinPal	¢	
Characteristic	S		
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis	N	N/A 3 N/A 3 N/A 3 N/A 3	Excellent
Height	м	Canopy Type	-
Stress Tolerance	2	Emergence	2
Standability	3		

- yield environments Acceptable IDC tolerance; solid disease package
- Acceptable SWM tolerance

KEY Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage

5 = Not Recommended



This symbol indicates that there has been a new component added to the WinPak® variety in 2020.

Characteristics			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended	Excellen
Height	М	Canopy Type	In
Stress Tolerance	1	Emergence	3
Standability	1		

Grou	ip: <b>0.3 Da</b> y	/S	
Endist(2)			
Characteristics	;		
PRR Tolerance SDS Tolerance SWM Tolerance 3SR Tolerance ron Chlorosis		Not Recommended N/A 5 3 3 3	Excellent
Height	М	Canopy Type	Int
Stress Tolerance	2	Emergence	1
Standability	2		

- trials
- Acceptable IDC tolerance
- Strong stress tolerance
   Manage for SWM areas

Grou	ip: <b>0.3 D</b> a	ays	
Characteristics			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended 3 N/A 4	Excellent
Height	м	Canopy Type	-
Stress Tolerance	1	Emergence	1
Standability	3		
<ul> <li>Also available in</li> <li>Intermediate place</li> <li>expression for h</li> <li>Excellent IDC to</li> <li>Acceptable PRF</li> </ul>	n WinPa ant type nigh-yiel plerance R field to	Ik <sup>®</sup> variety CP0200X with strong lateral ld environments s, similar to CP0426X plerance with Rpstc (	gene



Characteristics			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended E	Excellent
Height	м	Canopy Type	-
Stress Tolerance	1	Emergence	1
Standability	1		

Manage placement on acres with BSR history

<b>Characteristics</b>			
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		N/A 3 3 2 2	xceilent
Height	М	Canopy Type	-
Stress Tolerance	2	Emergence	1
Standability	2		

#### KEY

Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

This symbol indicates that there has been a new component added to the WinPak® variety in 2020.

	WinPa	k'	
Characteristic	6		
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended  N/A  4  2  2  2  2  2  2  2  2  2  2  2  2	Excellent
Height	м	Canopy Type	-
Stress Tolerance	2	Emergence	2
Standability	2		
<ul> <li>WinPak<sup>®</sup> variet CP0878X</li> </ul>	y consistin	g of CP0678X and	

CROPLAN	P0721	E	
Gro	up: <b>0.7 Day</b>	S	
eliste)			
Characteristic	S		
PRR Tolerance		Not Recommended	Excellen
SDS Tolerance		N/A	
SWM Tolerance		5	
ron Chlorosis		2	
Height	MT	Canopy Type	-
Stress Tolerance	1	Emergence	1
Standability	2		

......

excellent stress tolerance

Strong IDC tolerance
 Excellent PRR package

• Not recommended for BSR areas

CROPLAN C	<b>PO819</b> up: <b>0.8 Day</b>	<b>X</b> s	
Characteristics	6		
PRR Tolerance SDS Tolerance SWM Tolerance BSR Tolerance Iron Chlorosis		Not Recommended	Excellent
Height	м	Canopy Type	-
Stress Tolerance	2	Emergence	1

Also available in WinPak\* variety CP0970X
Excellent PRR field tolerance and strong stress tolerance across variable acres
Strong performance on IDC-prone acres
Manage placement on acres with significant SWM history

#### KEY

Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended

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This symbol indicates that there has been a new component added to the WinPak® variety in 2020.

KEY Scale 1 = Excell 2 = Strong 3 = Accept 4 = Manag 5 = Not Re									NEW	NEW								NEW	NEW		_	REALIN	<i>~</i>
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has been a new component added to the WinPak® variety for 2021.

Product descriptions and ratings are generated from Answer Plot<sup>®</sup> trials and/or from the genetics supplier and may change as additional data is gathered.

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additional data is gathered. supplier and may change as

\*WinPak® seed components only. Not for sale individually.

CROPLAN

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SOYBEAN



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# ALFALFA

#### 1 of 2

#### **KEY TAKEAWAYS**

- 1 Choose varieties with the traits that fit your fields and management.
- **2** Use coated seed to help you improve stand establishment and seed efficiency.
- **3** Manage in-season by Reading the Stand and harvesting and storing properly.

#### VARIETY SELECTION

#### FALL DORMANCY (FD) And Winterhardiness (WH)

- A higher FD number equals higher yield potential. A lower WH number equals more cold tolerance and stand persistence.
- Independent of breeding efforts, lower FD (more dormant) provides a significant increase in fiber digestibility potential.

#### PEST RESISTANCE

#### Anthracnose Disease

- A severe stem and crown disease that causes defoliation. Multiple races, including a new race 5, can be present in late season.
- Varieties are now available with multi-race high resistance.
- It occurs most often under warm, moist conditions.
- It causes yield loss of up to 25%.
- Susceptible plants have large, sunken ovalto diamond-shaped lesions.
- Lesions can enlarge to girdle or kill plant. Girdled stems can exhibit a shepherd's hook.
- Aphanomyces Root Rot Disease
- Causes seedling stunting, reduced nodulation and poor root development.
- Race 1 is widely identified in the U.S.
- Race 2 is in more isolated areas of the Midwest, East and pockets of the Pacific Northwest.
- New race 2/3 is a more severe pathogen found in the same areas as race 2.

#### Going the extra mile isn't extra to us.

Our dedication goes way beyond a handshake or a pat on the back. We're fully committed to you and the success of your alfalfa crop from day one.

That means we'll work closely with you to help you select the best genetics for your field – pairing new traits with the latest technologies to give you your very best chance to produce higher-quality feed and optimize tonnage.

Meeting your expectations? Heck, we're more interested in beating them.

- Varieties are now available with multi-race high resistance.
- Commonly found in saturated, poorly drained and/or compacted soils.
- ► Potato Leafhopper (PLH)
- Small, light-green insect that feeds on alfalfa plants, causing leaf tips to display a V-shaped yellowing.
- Varieties with glandular hairs provide natural nonpreference feeding for PLH.
- Commonly found in the Plains, Midwest and East; most severe in new seedings and summer regrowth that causes yield reduction.
- Nematodes
- Microscopic roundworms (several identified species) that live in the soil, surface irrigation water, alfalfa roots and crown tissue.
- Can reduce yield and stand life and cause secondary infections from other diseases. Control them by planting a high-resistance alfalfa variety.
- Commonly found throughout most of the West and Plains.
- ► High-Salinity Soils
- There are three methods to determine tolerance: the petri dish germination test, the forage greenhouse test and the field test. Salt-breeding nurseries provide varieties with more predictable performance for on-farm potential.
- Soils vary. Saline: high soluble salts. Sodic: high sodium ion content. Alkaline: soil pH that is higher than optimum (pH>8.0).
- Commonly found in the western half of the U.S.
- Aphids
- Can be a problem in dry periods; controlled by other predators in cool and/or wet periods.
- The blue aphid is the most damaging in the Southern Plains to the Southwest.

#### **IN-SEASON MANAGEMENT**

#### NEW SEEDING AND STAND ESTABLISHMENT

- Plant into a firm seedbed to control seed depth; seed-to-soil contact is crucial.
- Planting rates do not need to be adjusted for coated seed since bulk density is higher.
- The planting rate for alfalfa varies from region to region, but generally 18 to 20 lbs. per acre is recommended with a goal of about 25 plants per square foot at the end of the seeding year.

#### **ESTABLISHED STANDS: READING THE STAND**

- Each spring, determine potential winter damage or winterkill.
- Follow the Reading the Stand program to evaluate the alfalfa stand density and crown health of each field to determine current and future yield potential.

#### WEED CONTROL

 Control weeds early for a high-producing pure alfalfa stand. Roundup Ready<sup>®</sup>
 Alfalfa provides farmers with more flexible management strategies.

#### **INSECT AND DISEASE CONTROL**

- Control insects such as aphids (spotted, blue, pea, cowpea), alfalfa weevils and leafhoppers.
- Manage foliar leaf diseases and anthracnose.
- Choose alfalfa varieties with built-in resistance and use a spray application to control as necessary.

#### NUTRIENT MANAGEMENT

- Alfalfa requires a neutral soil pH (6.8 to 7.2) for high production. Take soil and plant tissue tests to monitor macronutrients and micronutrients.
- A healthy alfalfa plant will have a luxury supply of potassium, boron, sulfur and phosphorus.

#### HARVEST MANAGEMENT

- Minimize leaf loss and added ash (dirt) content from overhandling during raking and merging.
- Wheel traffic can increase soil compaction and crown damage, leading to reduced crop regrowth and yield loss.



# ALFALFA

### 2 of 2

#### **COATED SEED**

#### IMPROVE SEEDLING EFFICIENCY WITH COATED SEED

- Provides an ideal microenvironment with better imbibition (water uptake) and germination.
- Facilitates and enhances the addition of seed treatments/inoculants, which are applied by weight, not per seed; therefore, higher rates are applied on coated seed.
- Keeps treatments/inoculants close to or bound to the seed for more complete coverage.
- Increases vigor under disease pressure.
- Purdue reported an average 30% increase in seedling success for coated seed.<sup>1</sup>

#### SEED COATING

- ► GroZone<sup>®</sup> plus Advanced Coating<sup>®</sup> Zn 34%
- · Rhizobium bacteria to fix nitrogen.
- Micronutrient package to provide zinc and manganese.
- Ascend<sup>®</sup> PGR to promote early seedling growth.
- Apron XL<sup>®</sup> fungicide to help protect seedlings from root diseases such as phytophthora during establishment.
- Stamina<sup>®</sup> fungicide to provide additional protection to multiple races of aphanomyces root rot disease.
- Provides an average 30% increase in resistance to aphanomyces root rot as compared to standard treated commercial 9% coat.<sup>2</sup>
- ► Apex<sup>™</sup> Green
- OMRI Listed<sup>®</sup> for organic use.
- Includes natural micronutrients and nitrogen-fixing rhizobia in an organic hydration coating that maximizes water absorption.

#### TRAITS

#### HARVXTRA® ALFALFA<sup>3</sup>

HarvXtra<sup>®</sup> Alfalfa with Roundup Ready<sup>®</sup> Technology is one of the most advanced alfalfa traits currently available, providing extra flexibility when it comes to cutting without sacrificing forage quality or yield potential.

- Gives you a more flexible cutting window to help manage your operation, putting you in control of your cutting schedule.
- Delivers a higher RFQ<sup>3</sup> and NDFd<sup>3</sup> than conventional varieties cut on the same day.
- Achieve up to 20% higher yield at harvest<sup>4</sup> by lengthening your cutting window up to 10 days.

#### **ROUNDUP READY® ALFALFA**

- · Offers application flexibility for greater weed-control options.
- · Helps deliver a higher percentage of pure alfalfa for more high-quality hay and haylage.
- · Delivers exceptional weed control and crop safety.

#### **CONVENTIONAL ALFALFA**

- Conventional alfalfa breeding techniques have provided strong advancements in yield production, stand persistence, and insect and disease resistance.
- For more than three decades, alfalfa breeders have used conventional alfalfa breeding techniques (non-GE) to select for improved fiber digestibility (e.g., LegenDairy and RR Presteez lines).
  - These varieties show an incremental improvement in fiber digestibility when compared to nonselected varieties.
- May be approved for organic hay production when used with OMRI Listed<sup>®</sup> Apex<sup>™</sup> Green coated seed option.

#### FLEXIBILITY OF HARVXTRA<sup>®</sup> HAS NEVER BEEN MORE IMPORTANT

With unpredictable weather patterns, you need the ability to alter your cutting plans quickly. HarvXtra<sup>®</sup> Alfalfa lets you maximize your growing season by providing the flexibility to space out cuttings so that each harvest optimizes ROI and yield potential.

#### HARVXTRA® CUTTING SCHEDULE



1. Alfalfa and Red Clover Stand Establishment Forage Management Day at Feldun-Purdue Agricultural Center, August 9, 2018. Seeding Date: May 2, 2018. Varieties: Magnum 7 for alfalfa and Durango for red clover, uncoated alfalfa seed, coated alfalfa seed, 2/3 rate uncoated, 2/3 rate coated, 4 reps with plots 2.5 by 20 feet. Counted on June 29, 2018. 2. Data from FGI trials in West Salem, Wis., 2018.

3. Data from FGI trials comparing HarvXtra<sup>®</sup> Alfalfa with Roundup Ready<sup>®</sup> Technology 2017 FD4 commercial varieties to FD4 commercial checks. Trials were seeded in 2013 and harvested in 2014, 2015 and 2016 in Boone, Iowa; Mt. Joy, Pa; Nampa, Idaho; Touchet, Wash.; and West Salem, Wis. Yield increase is directly correlated to the ability to delay harvest.

4. Data from an FGI trial in West Salem, Wis., comparing three cuttings at 35-day intervals to four cuttings at 28-day intervals, with the three-cut system yielding 26% more over the life of the stand. Trials were seeded in 2013 and harvested in 2014, 2015 and 2016. Yield increase is directly correlated to the ability to delay harvest.





KEY

Scale

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2 = Strong 3 = Acceptable

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**CROPLAN** RR Saltiva Regions: Central North West Dormancy: 4.8 Winterhardiness: 2.5 Roundup **Characteristics** Excellent Excellent Not Recommended Yield Index 1 Persistence Index 2 Feed Quality 3 Disease Resistance 3 Nematode Resistance 1 First commercial variety selected from our salt breeding nurseries • Excellent pest-resistance package; high resistance to stem nematode and multispecies aphid resistance · Exceptional performance in tough soils with high saline conditions; great for 5-cut intensive hay or haylage harvest systems

**CROPLAN** RR Vamoose

Dormancy: 3.9

Roundup

**Characteristics** 

Persistence Index

Disease Resistance

Nematode Resistance

may be necessary

a 3- to 4-cut system

Yield Index

Feed Quality

Winterhardiness: 1.8

Regions: Central|East|North

Performs well in the Upper Midwest and East where high resistance to potato leafhopper (PLH)

• PLH resistance provides improved yield potential,

Outstanding agronomics; PLH resistance offers reduced-spray or no-spray options; best-suited in

high-quality feed and stand persistence

Not Recommended Excellent

1

3

3

4

3

High-forage yield potential, fast regrowth and good winterhardiness; ideally suited for a 4- to 5-cut haylage or aggressive hay management

Scale 1 = Excellent 2 = Strong 3 = Acceptable

4 = Manage 5 = Not Recommended

KEY

Winterhardiness: 1.5

Exceptional wet soil disease package, similar to

the conventional Rebound line with the added benefit of the Roundup Ready\* trait

High resistance to multirace aphanomyces root rot disease (races 1, 2/3), ideal for the Midwest, East and West, where aphanomyces root rot disease can be a problem

Provides high yield and excellent forage quality potential under a 4- to 5-cut haylage or aggressive

Not Recommended

3

2

2

Excellent

Roundup

**Characteristics** 

Persistence Index

Disease Resistance

Nematode Resistance

hay management system

Yield Index

Feed Quality

Product descriptions and ratings are generated from Answer Plot® trials and/or -from the genetics supplier and may change as additional data is gathered.

Feed quality ratings for HarvXtra® Alfalfa are represented on a separate scale than Roundup Ready® and conventional alfalfa varieties and are signified with an "H." Because there is a significant improvement in forage quality, HarvXtra® Alfalfa products can only be compared to other HarvXtra® Alfalfa products.

Winterhardiness: 2

Not Recommended

3

Exceptional ability to perform well across multiple

Features a good disease-resistance package for

geographies and growing conditions

3

3

Roundup

**Characteristics** 

Persistence Index

Disease Resistance

Nematode Resistance

soils east to west

Yield Index

Feed Quality

system



Excellent option for mixed grass and alfalfa

· Great winterhardiness and stand persistence for

- producers in Northern growing regions; moves well east to west
- · Ideally suited for 3- to 4-cut baled hay or haylage harvest system. Great choice for producers who prefer mixed alfalfa-grass stands

Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

Scale

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5 = Not Recommended

KEY

Feed quality ratings for HaryXtra® Alfalfa are represented on a separate scale than Roundup Ready® and conventional alfalfa varieties and are signified with an "H." Because there is a significant improvement in forage quality, HarvXtra® Alfalfa products can only be compared to other HarvXtra® Alfalfa products.



KEY

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 3 = Acceptable
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Product descriptions and ratings are generated from Answer Plot<sup>®</sup> trials and/or from the genetics supplier and may change as additional data is gathered. Feed quality ratings for HarvKtra® Alfalfa are represented on a separate scale than Roundup Ready® and conventional alfalfa varieties and are signified with an "H." Because there is a significant improvement in forage quality, HarvKtra® Alfalfa products.



Excellent



KEY

Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage

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Feed quality ratings for HarvXtra® Alfalfa are represented on a separate scale than Roundup Ready® and conventional alfalfa varieties and are signified with an "H." Because there is a significant improvement in forage quality. HaryXtra® Alfalfa products can only be compared to other HarvXtra® Alfalfa products.

€ ALFALFA

# **ALFALFA VARIETY PLACEMENT<sup>1</sup>**

The map can be used to determine which alfalfa varieties are recommended for your area's climate challenges. Also, use the chart below to place the recommended variety to help cutting trequency. manage common diseases and pests in your area, and to match quality to your desired

- ROUNDUP READY<sup>®</sup> VARIETIES
- CONVENTIONAL VARIETIES
   VARIETIES WITH ADDITIONAL INSECT AND DISEASE RESISTANCE
- HARVXTRA<sup>®</sup> ALFALFA VARIETIES

# PRODUCT DORMANCY MAP<sup>2</sup>

various regions of the United States. Fall dormancy and winterhardiness are important considerations in alfalfa seed selection. This map shows  $CROPLAN^{\otimes}$  seed varieties that match fall dormancy and winterhardiness zones in

WINTERHARDY FD2/3 WINTERHARDY FD3/4



results to be obtained, including but not limited to yields, cannot be predicted or guaranteed by WinField United. described above is your decision. Because of factors outside of our control, such as weather and product application, 1. This chart is provided as an illustration only. Planting decisions are complex and any implementation of the placement

2. Fall dormancy (FD) and winterhardiness (WH): Higher FD number = higher yield potential; lower WH number = more cold tolerant and stand persistent.

CROPLAN 

€ ALFALFA



# FALL DORMANCY: 2.0-5.0

					NEW														NEW
Nimbus	Gunner	Rebound AA	Rebound 6XT	TrailBlazer XHH	LegenDairy AA	LegenDairy XHD	MP 1000 Brand	Maxi Graze®	RR Tonnica	RR Saltiva	RR Stratica	RR AphaTron 2XT	RR Vamoose	RR Presteez	Graze N Hay 3.10RR	HVX MegaTron	HVX Driver	HVX HarvaTron	HVX Tundra II
Conventional	Conventional	Conventional	Conventional	Conventional	Conventional	Conventional	Conventional	Conventional	Roundup Ready	Roundup Ready	Roundup Ready	Roundup Ready	Roundup Ready	Roundup Ready	Roundup Ready	HarvXtra	HarvXtra	HarvXtra	HarvXtra
5.0	4.9	4.4	4.3	4.0	3.4	3.2	3.0	2.0	5.0	4.8	4.3	4.0	3.9	3.2	2.9	4.2	4.0	3.9	$\overset{\omega}{\cdot}_{\omega}$
2.2	1.2	1.7	1.5	3.0	1.1	1.2	3.0	2.0	2.0	2.5	2.0	1.5	1.8	1.2	1.8	1.7	2.0	2.1	1.2
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# KEY

2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended Scale 1 = Excellent

# Feed Quality Index

be compared to other HarvXtra® Alfalfa products. improvement in forage quality, HarvXtra® Alfalfa products can only varieties and are signified with an "H." Because there is a significant separate scale than Roundup Ready® and conventional alfalfa Feed quality ratings for HarvXtra® Alfalfa are represented on a

# 2 Salt Tolerance

**F** = Variety tolerance for forage growth under high saline **G** = Variety tolerance for germination under high saline conditions as a potted plant in the greenhouse conditions in a petri dish

## **Resistance Ratings** LR = Low Resistance (6–14%) MR = Moderate Resistance (15–30%) $\mathbf{R} = \text{Resistance} (31-51\%)$ S = Susceptible (0-5%)

**HR** = High Resistance (>50%)

or from the genetics supplier and may change as additional data is gathered. Product descriptions and ratings are generated from Answer Plot® trials and/

Note: Field tests are currently being used to select and validate true salt-tolerant varieties. Many soils that are high in salinity also have other problematic conditions. Therefore, germination and forage salttolerant ratings may not predict field performance



# £ ALFALFA



# FALL DORMANCY: 6.0-9.0

						NEW
Sun Quest®	Sun Titan	Artesian Sun 6.3	RR Desert Rose	RR 6 Shot Plus	HVX 840RR Brand	HVX 620RR Brand
Conventional	Conventional	Conventional	Roundup Ready	Roundup Ready	HarvXtra	HarvXtra
9.0	8.4	6.0	8.5	6.0	7.9	6.0
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# Feed Quality Index

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Product Name	
Attributes	
Placement	
Product Name	
Attributes	
Placement	
Product Name	
Attributes	
Placement	
Product Name	
Attributes	
Placement	



# CORN SILAGE

#### Shortcuts. You don't take them; neither do we.

You have questions about how to improve corn silage yield. Together, we'll find the answers. We partner with you to select our Data Proven (high quality x high tonnage) silage products, diagnose pest problems and figure out your exact plant nutrition needs throughout the growing season. We understand the importance of having the right levels of quality nutrients in your silage. This is good news for you. It's even better news for your corn silage crop.

#### **KEY TAKEAWAYS**

- 1 Select hybrids based on forage quality and tonnage needs.
- 2 Properly harvest and store your crop.

#### SELECT HYBRIDS FOR QUALITY AND TONNAGE

This scatter graph illustrates yield as tonnage per acre on the horizontal axis and milk per ton as quality on the vertical axis. The lines through the center represent the trial average.

Each year, replicated corn silage trials are planted at Answer Plot<sup>®</sup> locations nationwide. After harvest, data is compiled and summarized over multiple years and locations to provide a performance snapshot.

Considering both nutrient requirements and agronomic factors during hybrid selection is an important risk-management tool for corn silage products. CROPLAN® corn silage hybrids that consistently perform in this highquality and high-tonnage quadrant are marked with the Data Proven logo.



Your nutritionist can determine the parameters for nutrient needs, and your WinField United representative can use Answer Plot<sup>®</sup> data in the R7<sup>®</sup> Tool to help position each hybrid for optimal performance based on multiple variables.

#### **SEE HOW SEED MEASURES UP**

The CHT function of the R7<sup>®</sup> Tool uses Answer Plot<sup>®</sup> program data to compare CROPLAN<sup>®</sup> seed products, as well as seed from other major companies, to see how they are projected to perform in fields like yours. CHT charts show how various hybrids are projected to perform at high and low plant populations when compared to the following categories:\*

- Yield
- Milk per acre
- NDFD
- Starch

\*Other categories are available.

#### SILAGEFIRST<sup>®</sup> SEED LINE DELIVERS

The SilageFirst<sup>®</sup> seed line of products from CROPLAN<sup>®</sup> seed is specifically designed for high-producing dairy and beef cattle. There are three types of SilageFirst<sup>®</sup> hybrids.

#### LEAFY HYBRIDS

• Leafy stalks are thicker and more digestible, with larger ears to produce more energy.

#### **FLOURY-LEAFY HYBRIDS**

- At feedout, floury-leafy products effectively bridge the gap between the previous year's corn silage pile and the current year's feed.
- Leafy and floury-leafy hybrids may not contain a high level of total starch, but have a softer kernel texture that is easily broken during the chopping, storage and chewing process. This allows starch to be readily digested for more available energy.

#### **HIGH-ENERGY/HIGH-TONNAGE HYBRIDS**

- These hybrids have more flexibility in harvest and feedout as grain or high-energy/high-tonnage silage when used in combination with leafy and floury-leafy hybrids.
- These are appropriate for feeding after the 120+ day post-ensiling period, when they reach
  optimum starch and fiber digestibility.







Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

1 = Excellent

2 = Strong 3 = Acceptable

4 = Manage 5 = Not Recommended

CROPLAN® corn silage hybrids that consistently perform for high-quality and high-tonnage in Answer Plot<sup>®</sup> trials



CROPLAN CP3300SRR Relative Maturity: 93 Days Ready (mg) **Tonnage vs NDFD** Tonnage HIGH MODERATE LOW LOW MODERATE HIGH NDFD Floury x leafy silage-only hybrid with very high tonnage White cob hybrid with large semi-flexed ears that can handle lower populations Highly responsive to nitrogen and fungicide applications **Characteristics** Not Recommended Excellent Seedling Vigor 1 Drought Tolerance Root Strength Tonnage Potential Milk/Acre Starch

CP2845SS/RIB

(mp)

Relative Maturity: 89 Days

MODERATE

Not Recommended

NDFD

· High yield potential across all soil types and

Manage placement for Goss's wilt

HIGH

1

[VT2P/RIB]\*

SmartStax

Tonnage

HIGH

MODERATE

LOW

**Tonnage vs NDFD** 

LOW

environments

**Characteristics** 

Drought Tolerance

Tonnage Potential

Seedling Vigor

Root Strength

Milk/Acre

Starch

										NEW											
	CP4079SS/RIB*	CP4203SS/RIB*	CP4242SS/RIB*	CP4199SS/RIB*	CP4188VT2P/RIB*	CP4100SVT2P/RIB*	CP4099SS/RIB*	CP3899VT2P/RIB*	CP3795VT2P/RIB*	CP3735SS/RIB	CP3611SS/RIB*	CP3575SS/RIB*	CP3499VT2P/RIB*	CP3399SS/RIB*	CP3300SRR	CP3240AS3220A-EZ*	CP2965VT2P/RIB*	CP2845SS/RIB*	CP2692AS3011A	CP184RR	BRAND
Martine Mar	100	102	102	101	101	101	100	86	97	97	96	95	94	94	93	92	89	89	86	80	NI: Washingd
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Product descriptions and ratings are generated from Answer Plot®

Plant Height

2 Ear Height

3 Ear Flex FL = Flex SF = Semi-flex FX = Fixed

4 Flower Date L = Late M = Medium E = Early

These ratings reflect trends observed in research trials that change with variations in rainfall, temperature, crop production patterns and other factors. Ratings on new hybrids are based on limited data and may change as more data is collected. \*Follow IRM guidelines and refuge configurations to preserve the benefits and insect protection of these technology crops.

**5** RTP/RTN/RTCC/RTF Ratings L = Low Response M = Moderate Response H = High Response **TBD** = To be tested in 2020.

6 Calibrate<sup>®</sup> Starch Rating of grain starch S = Slow M = Moderate silage samples.  $\mathbf{F} = Fast$ Relative rumen digestibility Ratings based on 2018-2019

> Calibrate<sup>®</sup> Fiber Rating Relative rumen digestibility of fiber S = Slow M = Moderate Ratings based on 2018-2019 F = Fast

silage samples.

By WINFIELD CROPLAN

GORN SILAGE

					NEW					NEW										
CP7000S	CP5900SVT2P/RIB*	CP5789VT2P/RIB*	CP5700SVT2P/RIB*	CP5678VT2P/RIB*	CP5550VT2P/RIB*	CP5370SS/RIB*	CP5277AS3220-EZ	CP5290DGVT2P/RIB*	CP6110VT2P/RIB*	CP5115SS/RIB*	CP5073SS/RIB*	CP5000SAS3122-EZ*	CP5887VT2P/RIB*	CP4791AS3111	CP4600SSS/RIB*	CP4676SS/RIB*	CP4488SS/RIB*	CP4444VT2P	CP4819AS3000GT	BRAND
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,	R	м	MF	R	3	R		SW	MF	R	MF	MF	1	3	SW		MF	R	1	O BUI

5 = Not Recommended 4 = Manage additional data is gathered. XT = Extra Tall T = Tall M = Medium S = Short H = High M = Medium L = Low

**KEY** Scale 1 = Excellent 2 = Strong 3 = Acceptable

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> silage samples. Relative rumen digestibility of fiber S = Slow Ratings based on 2018-2019 F = FastM = Moderate

Calibrate<sup>®</sup> Fiber Rating

CROPLAN By WINFIELD

**GORN SILAGE** 



d

Product Name Attributes	
Placement	
Product Name Attributes	
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Product Name Attributes	
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Product Name Attributes	
Placement	



# FORAGE Sorghum



#### **KEY TAKEAWAYS**

- 1 Select the right forage type for your operation.
- 2 Choose a hybrid that has the traits you need.
- **3** Practice in-season management for optimal production.

#### **SELECT THE RIGHT FORAGE TYPE**

#### Forage Sorghum (single-cut silage)

Tall plant that has a sweet stalk and small grain head with limited regrowth potential.

#### Sorghum x Sudan (multi-cut or grazing)

Strong tillering and regrowth ability, which is ideal for multiple harvests with increased tonnage potential.

#### Sudan (multi-cut or grazing)

Shorter stature with fine stalks; more leaves than a sorghum x sudan. Multiple tillering ability and excellent regrowth.

#### Pearl Millet (multi-cut or grazing)

Brachytic plant stature with finer stalks and prolific tillering.

#### SELECT THE HYBRID WITH THE TRAIT YOU NEED

#### **BROWN MIDRIB-6 TRAIT**

- · Excellent forage quality and agronomics
- The nutritional value potential is comparable to corn silage
- Traits available in the following forage types: forage sorghum, sudan hybrid, sorghum x sudan hybrid, pearl millet

#### BRACHYTIC TRAIT

- Shorter stature and high leaf-to-stem ratio due to reduced internode length
- · Excellent standability and tillering
- Traits available in the following forage types: forage sorghum, sudan hybrid, sorghum x sudan hybrid, pearl millet

#### PHOTOPERIOD SENSITIVITY TRAIT

and never filled with excuses.

Extended harvest window

• Remains in the vegetative state until day length falls below 12 hours and 20 minutes; it will then enter the reproductive stage

More tonnage potential

and not an ounce of excuses.

You hear a lot of talk about how to improve tonnage. Soon enough, it all starts to sound the same. We know what you want most: bottom-line results. Our job is to help you get those results with the right forage sorghum genetics. It's how we deliver the best nutrition, high total plant digestibility, and the specific traits that optimize production and quality.

We put all of this expertise into a comprehensive, season-long plan that's long on results

• Traits available in the following forage types: forage sorghum, sudan hybrid, sorghum x sudan hybrid

#### **IN-SEASON MANAGEMENT**

#### TREATED SEED

#### Seed Safener Treatment

Helps protect seed against preemergence herbicide applications, some herbicide carryover or residual, and some grass herbicides.

#### Systemic Insecticide Treatment

Effective on aboveground insects, such as early sugarcane aphid, for roughly 40 days.

#### Base Seed Treatment

Pearl millet hybrids include a base seed treatment only.

#### WEED CONTROL

Herbicides for forage sorghums are limited to bromoxynil, atrazine, metolachlor or 2,4-D.<sup>1</sup>

- Metolachlor, by itself or in combination with atrazine, is the recommended preemergence herbicide.
- There are no postemergence grass herbicides.
- Broadleaf postemergence herbicides include 2,4-D, bromoxynil and Huskie<sup>®</sup> herbicide.
- The best way to control weeds is to start with clean ground and get the crop up and shading the soil as quickly as possible.

#### FERTILITY

- Sorghums require 1 to 1.25 units of nitrogen per growing day. Apply at a 5:1 ratio of nitrogen to sulfur to help the plant convert nitrogen to protein.
- Stressed plants will not convert nitrate into usable protein, resulting in high concentrations of nitrates in the plant. High nitrates can be toxic if fed to cattle.

#### **SUGARCANE APHID (SCA)**

- Use a tolerant hybrid to slow down the rate of infestation.
- Use seed treatment for early control.
- Plant as early as soil temperature allows. An earlier-maturity variety may help avoid late-season infestations.
- Scout early and often; treat as soon as threshold is reached.
- Avoid use of pyrethroids and other insecticides that are harmful to beneficials (SCA natural enemies include lady beetles, hover fly and green lacewing). Insecticides may cause SCA numbers to increase rapidly.

#### FEEDING/HARVEST MANAGEMENT

#### FORAGE SORGHUM

Harvest at late-milk to soft-dough stage. Single-cut for silage when plant reaches 67% to 72% whole plant moisture. Forage sorghums can be harvested after frost in the North for silage.

#### SORGHUM X SUDAN

Optimal harvest timing is 40 days or 40 inches tall. Dry hay in the Plains, West, South and Southwest; haylage or baleage in the Midwest, East and Southeast. Start summer grazing when plants reach 18 to 24 inches. Remove animals when two nodes are left above the ground.

#### SUDAN

Optimal harvest timing is 40 days or 40 inches tall. Drydown is quicker than sorghum x sudan; provides ability for quicker pickup or dry hay option in areas that have been difficult in the past. Start summer grazing when plants reach 18 to 24 inches. Remove animals when two nodes are left above the ground.

#### PEARL MILLET

Optimal harvest timing is 40 days or 40 inches tall. Good choice for horse feed with lack of prussic acid and high digestibility; good for dry hay areas with high humidity during summer. Start summer grazing when plants reach 18 to 24 inches. Remove animals when there is six-inches of stubble height.

1. Read all labels before application.





- Avoid overwatering and excessive populations; plants can reach 8 feet tall
- Recommended seeding rate: 60,000 to 70,000 seeds per acre at 1 to 11/2 inches deep, depending on soil moisture

#### CROPLAN 3401

Regions: Central|South|West Maturity: Early/Mid

NEW

#### **Characteristics**



- New line of genetics; the IQ (improved quality) series is selected for higher forage quality potential than conventional hybrids
   Extremely flexible hybrid; excellent disease and
- drought tolerance allow for placement across most of the U.S.
- Excellent yield potential; similar to a late-season hvbrid
- Excellent standability; plants can reach 7 to 8 feet tall; manage water and fertility for a mid-maturity hybrid
- Recommended seeding rate: 50,000 to 60,000 seeds per acre at 1 to 11/2 inches deep, depending on soil moisture

#### CROPLAN 3501 Regions: Central|South|West Maturity: Mid

#### **Characteristics**

Stress Tolerance
Forage Quality
Disease Tolerance
Hay
Silage
Grazing

• New line of genetics; the IQ (improved quality) series is selected for higher forage quality

5

Not Recommended Excellent

5

2

1

1

2

- potential than conventional hybrids Extremely flexible hybrid; excellent disease and drought tolerance allow for placement across most of the U.S.
- Excellent yield potential; similar to a late-season hvbrid
- Excellent standability; plants can reach 7 to 8 feet tall; manage water and fertility for a mid-maturity hybrid
- Recommended seeding rate: 50,000 to 60,000 seeds per acre at 1 to 11/2 inches deep, depending on soil moisture



#### Greentreat® 1531

Regions: Central|East|North|South|West Maturity: Heads at ~50 days

#### **Characteristics**

Stress Tolerance Forage Quality Disease Tolerance Hay Silage Grazing



- Excellent forage quality of the BMR-6 gene paired with the brachytic dwarf trait for lower cutting height and high leaf-to-stem ratio
- A best-in-class variety for drought tolerance and heat stress; strong disease package for humid areas and those at risk for anthracnose
- Dry stalk (~5% less) paired with fine stems allows
- For easier transition into dry hay use
   Requires proper harvest management or forage quality may be compromised (40 days or 40 inches); harvest prior to 50 days before head is initiated
- Recommended seeding rate: 20 to 25 pounds per acre at 1 inch (by drill is recommended)



#### **Characteristics**



- Great forage quality with the BMR-6 gene; moves well across growing regions
- The brachytic dwarf trait provides shortened internode length for lower harvest height and greater leaf-to-stem ratio
- Ideal for hay or grazing systems; fast growing and quick recovery after cutting
- Harvest at 40 days or 40 inches, whichever comes first; for grazing, start when plants reach 18 to 24 inches, remove animals when two nodes are left aboveground
- Recommended seeding rate: 20 to 25 pounds per acre at a depth of 1 inch (by drill is recommended)

Scale KEY 1 = Excellent 2 = Strong 3 = Acceptable

4 = Manage

5 = Not Recommended

Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

#### Hybrid Number System

First Number: 1 = Sorghum x Sudan; 2 = Sudan; 3 = Forage Sorghum; 4 = Pearl Millet Second Number: 1 = very early; 2 = early; 3-4 = mid-early; 5 = mid; 6-7 = mid-late; 8 = late; 9 = PPS Third Number: 0 = No special features; 1 = BMR; 2 = BMR and photoperiod;  $\mathbf{3} = \mathsf{BMR}$  and brachytic;  $\mathbf{5} = \mathsf{Conventional}$  dwarf, not a brachytic;  $\mathbf{8} = \mathsf{Photoperiod}$ Fourth Number: Series number or new variety type



#### **CROPLAN** Greentreat 1741AT

NEW

Regions: Central|East|North|South|West Maturity: Heads at ~60 days

#### **Characteristics**

	Not Recommended	Excellent
Stress Tolerance	3	
Forage Quality		2
Disease Tolerance		2
Hay		1
Silage	3	
Grazing		1

- Great forage quality with the BMR-6 gene; moves well across growing regions
- The brachytic dwarf trait provides shortened internode length for lower harvest height and greater leaf-to-stem ratio
  Sugarcane aphid tolerance; ideal for hay or grazing systems; fast growing and quick recovery after cutting
- Harvest at 40 days or 40 inches, whichever comes first; for grazing, start when plants reach 18 to 24 inches, remove animals when two nodes are left aboveground
- Recommended seeding rate: 20 to 25 pounds per acre at a depth of 1 inch (by drill is recommended)



Regions: Central|East|North|South|West Maturity: photoperiod sensitive

#### **Characteristics**

	Not Recommended	Excellent
Stress Tolerance		2
Forage Quality	3	
Disease Tolerance		1
Нау		2
Silage		2
Grazing		2

- High-yield-potential product with the BMR trait for excellent warm-season accumulation of highly digestible fiber
- Photoperiod sensitive trait allows the plant to remain in the vegetative state with a minimum of 12 hours and 20 minutes of daily sunlight; then head formation starts
- Excellent disease tolerance; strong drought and heat tolerance; moves well east to west and north to south
- Versatile product for grazing, baled hay or silage with excellent regrowth; easier to dry when cut at 40 days or 40 inches
- Recommended seeding rate: 20 to 25 pounds per acre at a depth of 1 inch (by drill is recommended)



Maturity: Heads at ~50 days

#### **Characteristics**

	Not Recommended	Exceller
Stress Tolerance		1
Forage Quality		1
Disease Tolerance		2
Hay		1
Silage	5	
Grazing		1

- Leafy, compact structure; the BMR-6 gene provides superior forage digestibility
- Extremely uniform in maturing height with high yield potential and quick drydown; ideal for baled hay
- Resistant to sugarcane aphid; good disease tolerance and well-adapted for use in all growing areas
- Great for horses as dry hay or grazing with no prussic acid; harvest at 40 days or 40 inches
   Recommended seeding rate: 10 to 15 pounds per acre at a depth of 3/4 inch (by drill is recommended)

CROPLAN	PM 4612 BMR		CROPLAN	PM 45	507 PM
R	egions: Central East North South West laturity: Heads at ~50 days			Regions: Ce Maturity: He	entral East North South Wes eads at ~50 days
Characteristi	CS	C	characteri	stics	
Stress Tolerance Forage Quality Disease Tolerar 4ay Silage Grazing • Leafy, compa- provides exc • Extremely un yield potentia hay • Resistant to tolerance an areas • Great for hor prussic acid; • Recommend acre at a dep recommende	e https://www.idealformendedimensionality.com/ e b https://www.idealformendedimensionality.com/ b b b b c c c c c c c c c c c c c	S F S S S S	Stress Toleras Forage Quali Disease Tole lay Idage Frazing Leafy com maturing Excellent - Excellent - For baled i Resistant tolerance areas Great for I prussic ac Recommen	nnce ity rance pact structu height yield potent hay to sugarcan and well-ad horses as dr iid; harvest horse as dr iid; harvest horse as dr iid; harvest	Not Recommended Exc 2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4

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Product descriptions and ratings are generated from Answer Plot® trials and/or 1 = Excellent from the genetics supplier and may change as additional data is gathered.

3 = Acceptable 4 = Manage 5 = Not Recommended

Scale

2 = Strong

KEY

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NEW	NEW				NEW				NEW		NEW			
PM 4507 PM	PM 4612 BMR	PM 4611 BMR	PEARL MILLET	Greentreat® 1923	Greentreat 1741AT	Greentreat® 1731	Greentreat® 1531	SORGHUM X SUDAN HYB	3601	3501	3401	BMR 3211	FORAGE SORGHUM HYBRI	THER
Heads at ~50 days	Heads at $\sim$ 50 days	Heads at ~50 days		photoperiod sensitive	Heads at ∼60 days	Heads at ∼60 days	Heads at ~50 days	RIDS	Mid	Mid	Early/Mid	Early	DS	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
10-15 lbs	10-15 lbs	10-15 lbs		20-25 lbs	20-25 lbs	20-25 lbs	20-25 lbs		50-60K seeds	50-60K seeds	50-60K seeds	60-70K seeds		8
3/4"	3/4"	3/4"		1"	1"	1"	1"		1-1 1/2"	1-1 1/2"	1-1 1/2"	1-1 1/2"		INDER THE PROPERTY OF THE PROP
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 Hybrid Number: System

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 Third Number: 0 = No Special Features; 1 = BMR; 2 = BMR and Photoperiod; 3 = BMR and Brachytic; 5 = Conventional Dwarf, not a Brachytic; 8 = Photoperiod

 Fourth Number: Series number or new variety type



Product Name	
Attributes	
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Product Name	
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Product Name	
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Placement	
Product Name	
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Placement	



# SPRING Canola



There's no quit in you. And we've got some of the industry-leading innovations to make sure there's no quit in your spring canola crop. Like the latest solutions to disease issues, resistance to clubroot and blackleg, and the crop safety and weed-control features in TruFlex<sup>™</sup> canola with Roundup Ready<sup>®</sup> Technology. Plus established products like Roundup Ready<sup>®</sup> Spring Canola deliver outstanding yield potential, excellent crop safety and easier management.

Sound like a plan?

#### **KEY TAKEAWAYS**

- 1 Pick the right genetics for your environment.
- 2 Take advantage of the latest resistance genes for blackleg and clubroot.
- 3 Leverage the enhanced weed management and crop safety features of TruFlex™ canola with Roundup Ready<sup>®</sup> Technology.
- 4 Evaluate your disease environment, crop rotation and other production practices.

## CHOOSE THE RIGHT GENETICS AND TRAITS FOR YOUR ENVIRONMENT

The CROPLAN<sup>®</sup> seed canola portfolio brings genetic diversity to the farm with the latest weed-control options, like TruFlex<sup>™</sup> canola, which offers outstanding crop safety.

#### THE TRUFLEX™ WITH ROUNDUP READY® TECHNOLOGY SYSTEM HELPS YOU:

- · Have the ability to spray up to first flower.
- Manage both annual weeds and toughto-control perennials, including Canada thistle, dandelion and wild buckwheat.
- Be flexible with the Roundup PowerMAX<sup>®</sup> herbicide application rate to get the job done using 44 fluid oz. per acre or applying sequential rates of 22 fluid oz. per acre.
- Achieve better weed control and crop safety compared to Roundup Ready<sup>®</sup> Canola for improved yield potential.



#### MANAGE DISEASE

Optimizing canola performance includes evaluating cropping system elements such as disease environment, crop rotation and other production practices.

#### BLACKLEG

- Select hybrids that are rated "R" (most resistant) for this disease.
- Rotation is very important in keeping disease inoculum levels low.
- Rotation of blackleg-resistant groups can also be beneficial.
- Tank mixing a fungicide with an early weed-control application at the 2- to 3-leaf stage can potentially reduce your risk of yield loss.

#### CLUBROOT

- Clubroot hinders the canola plant root from developing and utilizing soil moisture and nutrients.
- It can be mistaken for other diseases, such as sclerotinia or blackleg, so it is important to dig up suspected plants.
- It is more difficult for clubroot to thrive when soils have a pH above 7.0.

Taking these steps can help slow the spread of clubroot:

- Clean equipment thoroughly.
- Control canola volunteers and other weeds that can host the disease.
- Plant CP955RR or CP9982RR, clubrootresistant CROPLAN<sup>®</sup> hybrids.

### 5 TIPS FOR STRAIGHT-CUTTING CANOLA

- 1 Select a hybrid with an adequate shatter score that's better suited for straightcutting.
- 2 Control weeds and diseases in every field.
- **3** Ensure a uniform stand; proper seeding rates will help.
- 4 Harvest in a timely manner, as soon as the seed is dry enough to store.
- **5** If the field is variable when approaching harvest, consider desiccation.



## CROPLAN<sup>®</sup> SEED DELIVERS AN EXCELLENT SHATTER SCORE<sup>1</sup>

CROPLAN<sup>®</sup> seed TruFlex<sup>™</sup> canola (CP9978TF) showed a lower shatter score than competitive checks in a recent study from Roseau, MN.

#### % OF YIELD LOSS TO SHATTER



Source: 2019 Canola Shattering Variety Trial. Northern Resources, Roseau, Minn. 1. Results not statistically significant and may vary. Because of factors outside of WinField United's control such as weather product application and

control, such as weather, product application and any other factors, results to be obtained, including but not limited to yields, financial performance or profits, cannot be predicted or guaranteed by WinField United.



CCP93ORR	CCP955RR Spring Canola
Rundup Ready	Roundup Resay
Characteristics	Characteristics
Not Recommended     Excellent       Oil Content     1       Drought Tolerance     1       Lodging     1       Straight Cutting     2	Oil Content     Not Recomm       Drought Tolerance     Image: Content       Lodging     Image: Content       Straight Cutting     Image: Content
<ul> <li>Industry-leading oil content</li> <li>Excellent yield potential for early maturity; strong stress tolerance</li> <li>Good for straight-cutting; good shatter scores</li> <li>Strong vigor; for less-than-ideal seedbeds and nottill</li> </ul>	<ul> <li>Excellent yield potential in high-yield environments</li> <li>Outstanding oil content</li> <li>Good for straight-cutting; good shat</li> <li>First clubroot-resistant CROPLAN*</li> </ul>

CP9919RR Spring Canola
Remotup Ready
Characteristics
Oil Content     2       Drought Tolerance     1       Lodging     3       Straight Cutting     2
<ul> <li>Earliest product in the CROPLAN<sup>®</sup> lineup</li> <li>High performance in heat- and/or moisture- stressed environments; pairs well with CP930RR</li> <li>Moves west very well</li> <li>Use with CP955RR to spread workload</li> </ul>



Scale KEY 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

SCN = Straight-Cutting











Product Name	
Attributes	
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Product Name	
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## **SUNFLOWER**



#### **KEY TAKEAWAYS**

- 1 Understand your market options.
- 2 Gain access to new genetics.
- **3** Choose traits designed to manage weed pressure.
- 4 Implement an effective weed-control strategy.

#### ACHIEVE YOUR MARKETING OBJECTIVES

Sunflower has become a market segmented by grain uses, and any single hybrid might fit one or more market options. Sunflower markets include:

#### **OIL-TYPE SUNFLOWER**

#### High Oleic

Specific oil levels trending above 85% oleic based on market requirements.\*

#### NuSun<sup>®</sup>

Standard for the oil market.

#### ► Hulling

All oil types that have proper seed size and ease of shell removal.

#### Birdseed

Regional markets throughout the United States for all oil types.

\*Contracting buyers' current high oleic percent rate.

#### Target your markets and hold nothing back.

In the seed business, experience matters. CROPLAN<sup>®</sup> seed has been in the sunflower business for more than 20 years. That history and know-how allow us to offer you a broad spectrum of diverse sunflower genetics.

Because of extensive testing and screening conducted locally through the Answer Plot<sup>®</sup> program, we can help select the best sunflower seed genetics for your operation. The genetics we offer can help manage disease pressure in your fields, with hybrids that can be positioned based on specific field stresses. And we have the latest traits in our portfolio. That's technology – and experience – you can count on.

#### **CONSIDER SEED SIZE AND COATING**

#### **SUNFLOWER SEED SIZE**

Plant-to-plant spacing is important, and seed size can play a role in achieving the correct spacing and population in sunflower crops.

#### PROSUN™ PRECISE SEED COATING

Prosun<sup>M</sup> precise seed coating is available on a number of CROPLAN<sup>®</sup> sunflower varieties and offers:

- · More seed size options per variety
- · Consistent seed size, which helps optimize yield potential
- · Uniformity in stand establishment
- · Even growth for optimal weed, disease and insect management

#### **CHOOSE THE RIGHT TRAITS**

We have a long history of offering farmers the DuPont<sup>™</sup> ExpressSun<sup>®</sup> and the Clearfield<sup>®</sup> Production System traits. Both provide good weed-control options to farmers.

#### **CONTROL WEEDS**

#### **BEYOND® AND EXPRESS® HERBICIDES**

- Both traits have advanced yield potential.
- Both require preemergence herbicide treatments (Spartan<sup>®</sup> Charge, BroadAxe<sup>®</sup> or Prowl<sup>®</sup> H<sub>2</sub>0) or preplant-incorporated herbicides (Framework<sup>®</sup>, Prowl<sup>®</sup> H<sub>2</sub>0 or Sonalan<sup>®</sup>) to combat kochia and Russian thistle.
- · Both are a Group 2 herbicide mode of action.
- The DuPont<sup>™</sup> ExpressSun<sup>®</sup> trait is tolerant to Express<sup>®</sup> herbicide.
- The Clearfield® Production System is tolerant to Beyond® herbicide.

ACTIVITY	BEYOND® HERBICIDE	EXPRESS® HERBICIDE
Activity on grass	Yes	No
Recommended Section® Three herbicide tank mix	Yes	Yes
Residual control	Yes	No
Better control of cocklebur, nightshade, lanceleaf sage, smartweed and grasses	Yes	No
Better control of Canada thistle, lambsquarters and wild buckwheat	No	Yes
Can be applied across a broader crop stage, from one leaf to bud	No	Yes
Can be applied a second time for later flushes	No	Yes



Characteristics	DuPont <sup>-</sup> Express <i>Sun</i> -	NuSun		
Not Recommended       Excellent         Dry down       3       1         Stalk Strength       3       1         Phomopsis       3       2         • High yield potential for early maturity       3       2         • Shorter plant height; very uniform       • DMR PI 8; resistant to all common U.S. races of downy midew       • Nice seed size for dehulling option	Character	istics		
<ul> <li>High yield potential for early maturity</li> <li>Shorter plant height; very uniform</li> <li>DMR Pl 8; resistant to all common U.S. races of downy mildew</li> <li>Nice seed size for dehulling option</li> </ul>	Oil Content		Not Recommended	Excellent
	Stalk Streng Phomopsis • High yield	th d potential for	r early maturity	2
	<ul> <li>High yield</li> <li>High yield</li> <li>Shorter p</li> <li>DMR PI 8 downy m</li> <li>Nice seed</li> </ul>	th d potential foi lant height; v i; resistant to ildew d size for dehi	r early maturity ery uniform all common U.S. races ulling option	s of

	450E	
Expre	essSun® Sunflower	
DuPont- Express <i>Sum</i>		
Characteristics		
Oil Content Dry down Stalk Strength Phomopsis	Not Recommended	Excellent 2 1 2
<ul> <li>Excellent yield p CP455E</li> <li>Top performer in</li> </ul>	otential; great complement	: to

- Stronger standability compared to CP455E; good hybrid to plant early
- DMR PI 8; resistant to all common U.S. races of downy mildew

	LAPI 03500	in Sumower
DuPont ExpressSun		
Character	ristics	
Oil Content Dry down Stalk Streng Phomopsis	gth	Not Recommended Excellen
Phomopsis • Excellent CROPLA	t yield poter	atial; top performer in
<ul> <li>Widely a condition</li> </ul>	dapted acro	iss regions and field
	-short plant	with excellent drydown



Clearfield Productor Byther for Surfaces	NuSun
Characteristics	
Oil Content Dry down Stalk Strength Phomopsis	Not Recommended Excelle
Outstanding yield and h     Mid-maturity with stron     DMR PI 6; resistant to m     downy mildew     Increased staygreen an     environments	igh oil-per-acre potential g overall disease package nost common U.S. races of d slower drydown in cooler

Clea Products	arfield System to Sunt	
Characte	ristics	
Oil Content		Not Recommended Excelle
Drv down		2
Stalk Streng	qth	3
Phomopsis		
	r yiela potei	to all known races of downy

Product descriptions and ratings are generated from Answer Plot<sup>∞</sup> trials and/or from the genetics supplier and may change as additional data is gathered.

CROPLAN Clearfield	Sunflower
炎 Clearfield	
Characteristics	
Oil Content Dry down Stalk Strength Phomopsis	Not Recommended Excellent
<ul> <li>High yield potential appearance</li> <li>Stable high oleic lev</li> <li>DMR Pl 6; resistant downy mildew</li> </ul>	with a great upright head rels to most common U.S. races of

CROPLAN CP38	145 Sunflower
Characteristics	
Oil Content Dry down Stalk Strength Phomopsis	Not Recommended Excellent
<ul> <li>Strong yield potential environments</li> <li>Consistent performation environments</li> <li>One of the top oil coor CROOR AN® lineuro</li> </ul>	al in higher-yielding ance across multiple antent products in the

Characteristics Oil Content Dry down Stalk Strength Phomopsis	Clearfiel	ji Fortown
Oil Content     2       Dry down     3       Stalk Strength     2       Phomopsis     3	haracteristics	
	bil Content Dry down Stalk Strength Phomopsis	Not Recommended Exce 3 2 3 2 2
<ul> <li>High yield potential, oil and oleic levels</li> <li>Above-average disease tolerance</li> <li>DMR PI 6; resistant to most common U.S. rac downy mildew</li> <li>Full maturity; best kept in S.D. through High F</li> </ul>	<ul> <li>High yield pote</li> <li>Above-average</li> <li>DMR PI 6; resis downy mildew</li> <li>Full maturity; be</li> </ul>	ntial, oil and oleic levels disease tolerance tant to most common U.S. races o est kept in S.D. through High Plair

KEY Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended

Product descriptions and ratings are generated from Answer Plot<sup>®</sup> trials and/or from the genetics supplier and may change as additional data is gathered.

# Ê SUNFLOWER



EXPRESSSUN® SUNFLO	NER C				•	B R								S	> <b>`</b>
CP432E		•	•	•	2,3,4	89	PI 8	ω	ω	Short	ω	N/A	1	2	
CP450E	•		•	•	2,3,4	94	PI 8	2	2	Med-Short	ω	1	2	1	
CP455E	•		•	•	2,3,4	94	PI 6	2	2	Med-Short	2	1	1	1	N
CP4909E		•		•	P3,3,4	91	ı	ω	2	Med-Short	2	N/A	1	1	ω
<b>CLEARFIELD® SUNFLOW</b>	IER														
CP545CL		•		•	P3, 3, 4	94	PI 6	2	2	Medium	ω	N/A	ω		N
CP549CL		•		•	P3, 3, 4	95	PI 15	-	1	Med-Tall	2	ω	2	ω	
CP568CL	•				3,4	99	PI 6		ഗ	Med-Tall	1	2	ω	2	<b>→</b>
CP7919CL	•			•	2,3,4	86	PI 6	1	ω	Med-Tall	2	2	ω	2	2
<b>CONVENTIONAL SUNFLO</b>	WER														
CP3845	•		•	•	3,4	96	'	4	5	Medium	1	1	2	2	4



Product descriptions and ratings are generated from Answer  $\text{Plot}^{\varpi}$ additional data is gathered. supplier and may change as trials and/or from the genetics

> Market Options Grain not guaranteed to be sold in your area.

> > 2 Downy Mildew Resistance

**PI 2 gene** = This gene is resistant to some of the

early races of downy mildew, but it is susceptible

Due to factors outside our control, WinField United does not guarantee oleic levels

prevalent before 2009; it is susceptible to races 314, 704, 714, 734 and 774. **PI 6 gene** = This gene is resistant to races to most of the common races found today.

> PI 15 gene = This gene is exclusive to CROPLAN® economic impact on all common races.

hybrids and is resistant to all known races of downy mildew.

**PI 8 gene** = This gene can get infected, but then stops downy mildew from advancing or having an

**PIP gene** = Proprietary gene developed to control all known races of downy mildew.

CROPLAN UNITED

SUNFLO	WER		
Product Name			
Attributes			
Placement			
Product Name _ Attributes			
Placement			
Product Name _ Attributes			
Placement			
Product Name _ Attributes			
Discoment			

\_



# HARD RED Spring Wheat

# Managing for high performance leads to optimal results.

Our CROPLAN<sup>®</sup> seed spring wheat varieties have demonstrated phenomenal performance nationally. We can help you select the right genetics to manage a strong wheat crop. According to the most recent Answer Plot<sup>®</sup> data, spring wheat varieties respond differently to various management techniques, so be sure to manage the varieties you plant appropriately. What's more, targeted input applications support responsible land use by eliminating unnecessary treatments.

Starting with high-performing varieties, we help you bring it all together to make for a great ending to your season.

#### **KEY TAKEAWAYS**

- 1 Top-dress nitrogen on responsive genetics for added potential.
- 2 Plant at the right population for optimal varietal performance.
- **3** Know how to manage your variety to best enable its response-to-fungicide (RTF) score.

#### MANAGE YOUR VARIETY'S RESPONSE-TO-NITROGEN (RTN) SCORE<sup>1</sup>

Customize nitrogen rate by variety to capture ROI potential. Optimize yield potential on more productive acres with higher nitrogen management by planting varieties with higher RTN scores. Protect yield potential on tougher acres by utilizing lower RTN score varieties on acres with lower-productivity soils or less nitrogen management.

#### RTN Yield Response Variance – 25.5 bu/A



#### USE RESPONSE-TO-FUNGICIDE (RTF) SCORES TO AID DECISION-MAKING<sup>1</sup>

Fungicides are another tool to help you optimize the yield potential of your wheat crop. RTF scores help you understand where fungicides may increase yield potential and protect ROI potential.

#### RTF Yield Response Variance – 18.9 bu/A



#### **OPTIMIZE SEEDING RATE BY VARIETY<sup>1</sup>**

Each CROPLAN<sup>®</sup> variety has its own response to population (RTP). Managing population correctly will help you optimize yield potential and help increase standability. Use seed size when determining optimal seeding rates. For more uniform emergence, use Warden<sup>®</sup> Cereals seed treatments plus Ascend<sup>®</sup> plant growth regulators.



#### SEEDING RATE CHART<sup>2</sup>

- Example of how to use the chart:
- 1. Select total planting seed. Example: 1.4 million seeds per acre
- 2. Select seeds per pound. *Example: 13,000*
- 3. Determine recommended seeding rate. *Example: 108 lbs. per acre*

Calculation assumptions: Germ: 95% Survivability: 10% Total stand loss: 15%

### MILLION SEEDS PER ACREPLANTS PER ACRE

**O PLANTS PER SQUARE FOOT** 



SEEDING RATE (LBS/A)

1. Response ranges show the importance of how varieties respond to each management practice to help ensure the highest yield potential. 2019 nationwide Answer Plot<sup>®</sup> data.

2. Because of factors outside of WinField United's control, such as weather, product application and any other factors, results to be obtained, including but not limited to yields, financial performance or profits, cannot be predicted or guaranteed by WinField United.





HIGH

protein



Not Recommended

· Excellent yield potential balanced with strong

performs well across management styles

to nitrogen, consider split N applications

Shorter plant type with very good standability

Best performance is on highly productive ground;

· Lower response to population; moderate response

Excellent

2

2

2

#### RTP RTN RTF **Characteristics** Not Recommended Excellent Standability 1 Fusarium Head Blight 2 Test Weight Protein 4

RTF

2

NEW

Not Recommended Excellent

3

RTN

· Genetics new to the CROPLAN® lineup and the industry

· Extremely high yield potential with acceptable protein rating

Strong disease package on a very large plant type; extremely large flag leaf

 High response to increased nitrogen; a great candidate for split-applications; very strong standability

Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

4 = Manage 5 = Not Recommended

Scale

1 = Excellent

KEY

2 = Strong 3 = Acceptable



KEY

Product descriptions and ratings are generated from Answer Plot® trials and/or from the genetics supplier and may change as additional data is gathered.

SCale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended

Scale

NEW	NEW	NEW					
CP309	CP305	CP390	CP391	CP391	CP353	CP341	VARI
9A	5	ω	0	5	0	9	ETY 10000
Hard Red	5 SPRING						
57	57	55	54	55	57	58	BUIL INCHASE
92	92	85	85	86	87	85	THI AND
-	-	Z	R	z	-	Z	HDP. HURPHERS
1	-	2	ω	2	4	1	Kill Sal
ω	4	2	ω	2	ω	ω	Int.
5	4	2	ω	2	2	4	us and any as a subset
N/A	N/A	ω	2	2	ω	4	hi. spirs alter alter alter
2	2	2	2	2	2	4	18. [4] HUNT OF SUL SAL
-	-	-	-	-	-	т	1HB188 113085
R	Ξ	Z	Z	т	Z	т	LIH STIP
Ξ	Ν	-	-	-	т	-	ungent ungesti
1	1	1	ω	1	4	1	JIBIIAPESH
2	2	2	ω	ω	2	2	Superior
N/A	N/A	ω	ω	ω	2	ω	SHUBAS
N/A	N/A		2	2			5 NB OF T
N/A	N/A	1	ω	N/A	ω	1	528511 18 <sup>19,1920</sup>
2	2	2	ω	ω	2	2	18315481. 18315481.
		ω	4	-	ω	ъ	
N/A	N/A	N/A	N/A	ω	N/A	N/A	

**KEY** Scale 1 = Excellent 2 = Strong 3 = Acceptable 4 = Manage 5 = Not Recommended

> Product descriptions and ratings are generated from Answer Plot<sup>®</sup> trials and/or from the genetics supplier and may change as additional data is gathered.

> > RTP/RTN/RTF Ratings
> >  L = Low Response
> >  M = Moderate Response
> >  H = High Response

The comparison ratings are with CROPLAN® wheats only. These ratings reflect trends observed in research trials, which will change based on various factors, including variations in rainfall, temperature and production patterns.





Product Name	_
Attributes	
Placement	
Product Name	_
Attributes	
Placement	
Product Name	
Attributes	_
Placement	
Product Name	
Attributes	_
Placement	



# HARD RED WINTER WHEAT

#### Built tough to handle whatever comes your way.

Growing hard red winter wheat is not for the faint of heart. Good thing the varieties offered by CROPLAN® seed are built to handle the rugged conditions found in the Central Plains Wheat Belt. As an innovator with a 20-year history in this space, you can count on CROPLAN® seed as the solid constant in an often-chaotic hard red winter wheat marketplace. We're credible. We're innovative. And the quality of our seed performance is backed by solid data.

#### **KEY TAKEAWAYS**

- 1 Apply nitrogen strategically throughout the season.
- 2 Plant at the right population for optimal varietal performance.
- **3** Know your variety's response-tofungicide score and manage that variety accordingly.

#### A NEW SYSTEM FOR ANNUAL GRASS WEED CONTROLS

CROPLAN® seed is pleased to introduce the CoAXium® Wheat Production System, which combines a patented herbicide-tolerant trait, elite varieties, a new herbicide brand (Aggressor®) and industry stewardship. Aggressor® herbicides provide effective, consistent, broad-spectrum control of problem grasses including *Bromus* species, feral rye, jointed goatgrass, wild oats and volunteer cereals. Aggressor® herbicides provide control of tough winter and spring annual grassy weeds, including Group 2-resistant biotypes (ALS inhibitors).



#### MANAGE YOUR VARIETY'S RESPONSE-TO-NITROGEN (RTN) SCORE

Customize nitrogen rate by variety to capture ROI potential. Optimize yield potential on more productive acres with higher nitrogen management by planting varieties with higher RTN scores. Protect yield potential on tougher acres by utilizing lower RTN score varieties on acres with lower-productivity soils or less nitrogen management.

#### USE RESPONSE-TO-FUNGICIDE (RTF) SCORES TO AID DECISION-MAKING

Fungicides are another tool to help you optimize the yield potential of your wheat crop. RTF scores help you understand where fungicides may increase yield potential and protect ROI potential.

#### **OPTIMIZE SEEDING RATE BY VARIETY**

Each CROPLAN<sup>®</sup> variety has its own response to population (RTP). Managing that correctly will help you optimize yield potential and help increase standability. Use seed size when determining optimal seeding rates. For more uniform emergence, use Warden<sup>®</sup> Cereals seed treatments.

#### SEEDING RATE CHART<sup>1</sup>

Example of how to use the chart:

- 1. Select total planting seed. Example: 1.4 million seeds per acre
- 2. Select seeds per pound. *Example: 13,000*
- 3. Determine recommended seeding rate. *Example: 108 lbs. per acre*

Calculation assumptions: Germ: 95% Survivability: 10% Total stand loss: 15%

MILLION SEEDS PER ACRE
PLANTS PER ACRE
PLANTS PER SQUARE FOOT

		SEED SIZ	ZE: SEEDS	PER POU	ND	-			
TOTAL PLANTING SEED	IRE LIVE SEED	11,6	13.0	13,000	13.6	15.00	FINAL STAND	PLANTSISG FI	2
×						0	0		
	0.8	0.8	73	67	62	57	53	0.7	15.6
	1.0	1.0	91	83	77	71	67	0.9	19.5
	1.2	1.1	109	100	92	86	80	1.0	23.4
	1.4	1.3	127	117	108	100	93	1.2	27.3
	1.6	1.5	145	133	123	114	107	1.4	31.2
	1.8	1.7	164	150	138	129	120	1.5	35.1
	2.0	1.9	182	167	154	143	133	1.7	39.0
	2.2	2.1	200	183	169	157	147	1.9	42.9

- SEEDING RATE (LBS/A) ------



<sup>1.</sup> Because of factors outside of WinField United's control, such as weather, product application and any other factors, results to be obtained, including but not limited to yields, financial performance or profits, cannot be predicted or guaranteed by WinField United.





**Response Scores** HIGH MODERATE LOW RTF RTP RTN **Characteristics** Not Recommended Excellent Standability 2 Fusarium Head Blight 3 Test Weight 2 Protein 3 Winterhardiness · High yield potential matched with outstanding disease package • Excellent standability; allows for pushing nitrogen

CROPLAN CP7869

Hard Red Winter



- · Excellent yield potential with consistent
- performance on dryland and irrigated acres Versatile product with excellent test weight and
- strong standability
- · Good north-south adaptability from Kansas to Texas Manage for mosaic and stripe rust; acceptable
- Hessian fly rating



Product descriptions and ratings are Scale generated from Answer Plot® trials and/or 1 = Excellent 2 = Strong from the genetics supplier and may change as additional data is gathered. 3 = Acceptable 4 = Manage 5 = Not Recommended



Fungicide recommended in areas with stem rust

to maintain adequate protein · Best fit is on well-managed dryland or irrigated acres Acceptable fusarium head blight tolerance; excellent stripe, stem and leaf rust tolerance

KEY

	NEW				
COAXIIIN	CP7010	CP7869	CP7909	CONVENT	IN
® WHFAT	Hard Red	Hard Red	Hard Red	<b>IONAL WHEAT</b>	D RED WINT
	11, 12, 13	11, 12, 13	8, 10, 11, 13		ER WHEAT
	4	4	ω		Outlight
	MT	Ξ	MT		- MILANI
	1	2	ω		INE INCIS
	2	2	ω		hill saues at.
	~	×	×		41,518,855
	N/A	N/A	N/A		unpusiting of subset
	ω	2	1		See 1411 12 11 10 South of States
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		I/A	I/A		8711855-58°
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	ω	1	2		HPBIB . LAHER
	N/A	N/A	N/A		ENGNOLIS. LIESTI
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	ω	ω	4		SURFESS SUBSEL
	ω	N/A	N/A		onen and a second
	1	1	1		×

NEW CP7017AX

Hard Red Hard Red

08, 10, 11, 12, 13 10, 12, 13

- ω

33

2

2

Y N/A

1

3 3

3 3

M 3 3 2 NA H 2 2 1 NA

N/A

N/A

1

N/A

2

2 N/A 3 N/A

 KEY
 Scale
 Product descriptions and ratings
 Maturity
 Height
 Strings

 1 = Excellent
 are generated from Answer Plot<sup>®</sup>
 1 = Early
 1 = Short
 L = Low Response

 2 = Strong
 3 = Acceptable
 supplier and may change as
 5 = Late
 5 = Tall
 M = Moderate Response

 4 = Manage
 additional data is gathered.
 5 = Not Recommended
 Height Response
 Height Response

The comparison ratings are with CROPLAN® wheats only. These ratings reflect trends observed in research trials, which will change based on various factors, including variations in rainfall, temperature and production patterns.

CROPLAN



Product Name	
Attributes	
Placement	
Product Name	
Attributes	
Placement	
Product Name	
Attributes	-
Placement	
Product Name	
Attributes	
Placement	



## SEED TREATMENTS

1 of 2

# Warden<sup>®</sup> CX

#### WARDEN<sup>®</sup> CX SEED TREATMENT HELPS PROTECT YIELD POTENTIAL FROM THE START

Warden® CX insecticide-fungicide seed treatment is designed to protect high-value seed from yield-robbing seedling disease and insect pests. Containing three fungicides for multiple modes of action, Warden® CX seed treatment can help provide optimal protection against *Fusarium, Rhizoctonia, Phytophthora* and *Pythium.* With Cruiser® insecticide for unmatched defense against seed and foliarfeeding insects, Warden® CX seed treatment is the first step toward high yield and profit potential.

#### EARLY-SEASON ADVANTAGES

Warden<sup>®</sup> CX seed treatment features the following crop protection advantages over untreated seed:

- Increases plant stands, promotes quick canopy closure and can improve yield potential.
- Helps improve root health and provides industry-leading *Rhizoctonia* protection.
- Contains sedaxane, the first fungicide developed exclusively for use as a seed treatment.
- Warden<sup>®</sup> CX includes one of the highest available rates of Apron XL<sup>®</sup> fungicide available in the industry. This allows for extended *Phytophthora* control in tough growing conditions.

#### ADDITIONAL ADVANTAGES

- Incorporates the active ingredient from Cruiser<sup>®</sup> insecticide, an industry standard for seed-applied insect protection, delivering the patented vigor effect (U.S. Patent number 6,753,296).
- Improves seed handling and flowability.

#### **OUTSTANDING DISEASE PROTECTION**

Warden® CX seed treatment contains sedaxane, a fungicide designed exclusively as a seed treatment. Creating strong, healthy root systems, it also provides *Rhizoctonia* protection. Warden® CX seed treatment has a high rate of mefenoxam, providing *Pythium* and *Phytophthora* seed and young seedling protection.

#### WARDEN<sup>®</sup> CX SEED TREATMENT HAS BEEN SHOWN TO IMPROVE PLANT STANDS, REGARDLESS OF PLANTING DATE<sup>1</sup>

Data from these trials showed that Warden<sup>®</sup> CX is a premier soybean seed treatment.



Source: 21 locations across key soybean-growing states; trials conducted with independent contract researchers.

1. Because of factors outside of WinField United's control, such as weather, product application and any other factors, results to be obtained, including but not limited to yields, financial performance or profits, cannot be predicted or guaranteed by WinField United.

#### **DISEASES AND INSECTS CONTROLLED**

Warden<sup>®</sup> CX seed treatment is designed to control a broad spectrum of destructive diseases, including the following:

#### DAMPING-OFF AND SEED ROTS

- Fusarium
- Pythium
- Phytophthora
- Rhizoctonia

#### **ROOT ROT**

- Phomopsis\*
- Sclerotinia\*
- Phytophthora
- \*Suppression only.

Warden<sup>®</sup> CX seed treatment is also designed to control a wide variety of destructive insects, including the following:

- · Aphids
- Bean leaf beetles
- Grape colaspis
- Leafhoppers
- Leaf miners
- Mexican bean beetles
- Seedcorn maggots
- Threecornered alfalfa hoppers
- Thrips
- White grubs
- Wireworms

#### PAIR WARDEN® CX WITH AN INOCULANT

Help meet the nitrogen needs of soybean crops by adding a microbial inoculant. These symbiotic rhizobia bacteria fix atmospheric nitrogen, improving modulation and boosting plant-available nitrogen.



## SEED TREATMENTS

2 of 2

# Fortivent<sup>®</sup> Plus

#### EARLY-SEASON INSECT AND DISEASE CONTROL WITH OPTIMIZED PLANT VIGOR

Fortivent<sup>®</sup> Plus seed treatment combines the early-season insect control of Poncho<sup>®</sup> VOTiVO<sup>®</sup> seed treatment, INTEGO<sup>®</sup> Solo fungicide for enhanced *Pythium* control and Fortivent Zn for early-season corn vigor. The Poncho<sup>®</sup> insecticide at a rate of 500 mg active ingredient combined with the nematode control of VOTiVO<sup>®</sup> seed treatment is designed to help control insects, while Fortivent Zn aids in early corn development, including stand establishment and enhanced yield potential.

#### ▶ Fortivent<sup>®</sup> Plus Features and Benefits

- All CROPLAN<sup>®</sup> Signature hybrids come with Poncho<sup>®</sup> VOTiVO<sup>®</sup> seed treatment
- Provides enhanced Pythium control with INTEGO® Solo fungicide
- · Includes Fortivent Zn for success in early-season growth and root development
- Includes 100% replant offering on all CROPLAN® Signature hybrids

#### YIELD ADVANTAGE

#### Fortivent Zn – 2018 Answer Plot<sup>®</sup> Testing



Active Ingredients*	Rates	
Insecticide		
Clothianidin	500	
*Clothianidin	1,250	
Base Fungicides (Acceleron <sup>®</sup> Seed Treatment)		
Fluoxastrobin	0.24 fl. oz./100 lbs. of seed	
Prothioconazole	0.24 fl. oz./100 lbs. of seed	
Metalaxyl	0.10 fl. oz./100 lbs. of seed	
Ethaboxam (INTEGO® Solo)	0.34 fl. oz./100 lbs. of seed	
Nematicide		
Poncho <sup>®</sup> VOTiVO <sup>®</sup> - 500	2.7 fl. oz./80,000 seeds	

\*Always read and follow label instructions.





#### **INNOVATIVE TECHNOLOGY**

Traits include SmartStax<sup>®</sup> corn technology with the broadest spectrum of control for above- and belowground insects, along with herbicide tolerance. DroughtGard<sup>®</sup> Hybrids are available with risk-management benefits for corn hybrids facing drought stress.

#### **CORN TRAITS**

- Farmers choose their level of insect protection field by field.
- SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend offers the broadest spectrum of above- and belowground insect protection with the simplicity and convenience of a singlebag refuge solution. Two modes of action against corn earworm and corn rootworm help optimize yield potential.
- VT Double PRO\* RIB Complete\* corn blend contains the first double-stacked trait with dual modes of action against aboveground insects and maximum protection against corn earworm. This extra protection helps increase yield potential while providing the simplicity and convenience of a single-bag refuge solution.
- DroughtGard<sup>®</sup> Hybrids provide farmers with a valuable tool for managing waterdeficit risks.



SmartStax<sup>®</sup> technology helps protect corn against ear-feeding insects.



#### SMARTSTAX<sup>®</sup> RIB COMPLETE<sup>®</sup> CORN BLEND

- It includes a 5% structured refuge, the lowest in the corn-growing area.
- Roundup Ready<sup>®</sup> 2 Technology and LibertyLink<sup>®</sup> herbicide tolerance provide weed control.
- This corn trait platform is achieved through best-in-class trait integration to help provide the highest level of whole-farm success.

#### Aboveground Control

SmartStax<sup>®</sup> technology controls aboveground insects by uniting *Bacillus thuringiensis* (B.t.) proteins with multiple modes of action from VT Triple PRO<sup>®</sup> and Herculex<sup>®</sup>. It stops stalk-feeding insects, such as corn borers, and protects against ear-feeding insects, including western bean cutworm, corn earworm and black cutworm. This protection has the potential to help improve grain quality.

#### Belowground Control

Belowground, SmartStax<sup>®</sup> technology combines high-performing VT Triple PRO<sup>®</sup> trait protection with complementary Herculex<sup>®</sup> XTRA rootworm protection. This unique combination of B.t. technologies provides season-long control of corn rootworm, a primary pest.

#### Roundup Ready<sup>®</sup> 2 Technology and LibertyLink<sup>®</sup> Traits Together

In addition to above- and belowground insect control traits, SmartStax® products include standard-setting weed control – the Roundup Ready® 2 Technology and LibertyLink® systems – for unprecedented weed management.

#### The First Single-Bag Refuge Solution

SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend products are a single-bag refuge solution for farmers – the first of its kind on the market. With SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend, the refuge seed is distributed in the bag along with seeds containing the SmartStax<sup>®</sup> trait, allowing farmers to plant an entire field with just one product. Farmers in corn-growing areas will no longer need to plant a separate, structured refuge when they use SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend.



- SmartStax<sup>®</sup> RIB Complete<sup>®</sup> Corn Blend Benefits
- Controls the most above- and belowground insects.
- Provides optimal yield protection with two ways to control corn rootworm and corn earworm.
- Includes a blend of 95% traited and 5% refuge seed with no separate, structured refuge required in the corn-growing area.
- Offers a truly simple refuge-in-a-bag solution just fill your planter and go.

#### Bringing New Germplasm to Market Faster

SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend products are developed using best-in-class trait integration that can bypass traditional slower breeding processes. This allows seed brands to bring new germplasm to market sooner. With all-in-one protection, seed brands will now be able to better evaluate each product's true performance in the field.



#### VT DOUBLE PRO<sup>®</sup> RIB COMPLETE<sup>®</sup> CORN BLEND

VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> corn blend allows you to plant the most traited acres fencerow to fencerow with the simplicity of a single-bag solution. There's no need to calculate or plant a separate structured refuge ever again. VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> corn includes 95% traited seed and 5% refuge seed. You get all the benefits of the VT Double PRO<sup>®</sup> trait plus the convenience of 5% refuge seed interspersed in every bag.

- VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> Corn Blend Benefits
- Optimal yield protection with two ways to control corn earworm.
- A blend of 95% traited and 5% refuge seed with no separate, structured refuge required in corn-growing areas.
- The truly simple refuge-in-a-bag solution just fill your planter and go.







#### THE TRULY SIMPLE REFUGE-IN-A-BAG SOLUTION

RIB Complete<sup>®</sup> is a single-bag refuge solution for farmers. With RIB Complete<sup>®</sup> corn blend, the refuge seed is distributed in the bag along with seeds containing B.t. traits, allowing farmers to plant an entire field with just one product. Farmers in the Corn Belt will no longer need to plant a structured refuge when they use RIB Complete<sup>®</sup> corn blend products.

5% refuae





20% refuge

5% refuge in the bag



#### DROUGHTGARD® HYBRIDS

DroughtGard<sup>®</sup> Hybrids are part of a system to help farmers manage risk by mitigating yield loss due to drought. The system offers farmers improved genetics, agronomic practice recommendations and the droughttolerant biotech trait. DroughtGard<sup>®</sup> Hybrids can help increase hydroefficiency under drought stress, which can result in increased kernel numbers and reduced frequency of barren plants, providing the opportunity to reduce yield loss in certain drought conditions. DroughtGard<sup>®</sup> Hybrids are available for sale in all states.

#### Traits Available With DroughtGard<sup>®</sup> Hybrids

DroughtGard<sup>®</sup> Hybrids will be available with the following corn traits: VT Double PRO<sup>®</sup> corn, VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> corn blend and Roundup Ready<sup>®</sup> Corn 2.

#### ► Advantages of DroughtGard<sup>®</sup> Hybrids

- In drought-stress conditions that caused damaging yield losses, comparisons demonstrated a 5-bushel-per-acre performance advantage with DroughtGard® Hybrids over commercially available competitive check products.<sup>1</sup>
- Ongoing research indicates that products with the drought-tolerant biotech trait have had more kernels per ear and can use less water during severe drought stress.
- DroughtGard<sup>®</sup> Hybrids have the potential to maintain top-end yield in well-watered conditions and provide a valuable tool for managing water-deficit risks.



#### **ROUNDUP READY® CORN 2 SYSTEM**

Whether you follow a pre- and postemergence spray program or only spray postemergence, Roundup Ready<sup>®</sup> Corn 2 will fit your system. Designed to work with Roundup<sup>®</sup> agricultural herbicides, the Roundup Ready<sup>®</sup> Corn 2 System provides outstanding yield potential without the crop injury other postemergence herbicides can cause.



#### **ROUNDUP READY 2 XTEND® SOYBEANS**

Built on high-yielding Roundup Ready 2 Yield® soybean technology, Roundup Ready 2 Xtend® soybeans contain the industry's first biotech-stacked soybean trait with both dicamba and glyphosate herbicide tolerance.

This tolerance gives farmers access to additional tools to help control glyphosateresistant broadleaf weeds such as Palmer amaranth, waterhemp and marestail, along with other tough-to-control broadleaf weeds such as lambsquarters and velvetleaf.

This technology offers the yield and quality potential that farmers already know and trust from Roundup Ready 2 Yield<sup>®</sup> soybeans.

1. 2012 Monsanto GroundBreaker plot trial based on approximately 250 growers in the western Great Plains.







#### **ROUNDUP READY 2 YIELD® SOYBEANS**

With more three-, four- and five-bean pods, Roundup Ready 2 Yield<sup>®</sup> soybeans offer a proven yield advantage over the competition. With more beans per pod and more bushels per acre, Roundup Ready 2 Yield<sup>®</sup> soybeans also provide more profit potential.

Research demonstrates a significant yield increase with Roundup Ready 2 Yield<sup>®</sup> soybeans over Roundup Ready<sup>®</sup> soybeans, with the same simple, dependable weed control as the Roundup Ready<sup>®</sup> Soybean System.<sup>1</sup>

#### Powerful Performance

Roundup Ready 2 Yield<sup>®</sup> soybeans contain in-plant tolerance to Roundup<sup>®</sup> agricultural herbicides, allowing farmers to spray Roundup<sup>®</sup> agricultural herbicides on crops from emergence through flowering.

The occurrence of more three-, four- and five-bean pods per plant is contributing to the increased yields seen with Roundup Ready 2 Yield<sup>®</sup> soybeans. These soybeans have demonstrated a clear yield advantage opportunity over the competition by delivering an average of 4.5 bushels per acre more than original Roundup Ready<sup>®</sup> soybeans.<sup>2</sup>

### CUMULATIVE NUMBER OF ROUNDUP READY 2 YIELD® VARIETIES



 Roundup Ready 2 Yield<sup>®</sup> soybeans yield higher than Roundup Ready<sup>®</sup> soybeans, based on 73 Monsanto field trials (17 to 20 per year) from 2004 to 2007. The four-year average percentage increase for Roundup Ready 2 Yield<sup>®</sup> equals 8.63, with a 95% confidence interval of 6.8% to 10.5% advantage from Roundup Ready 2 Yield<sup>®</sup>.
 Data as of October 29, 2012. Includes all breeding and commercial strip trial data. All headto-head comparisons are within a +I-0.4 day maturity. Data represents the top-performing Roundup Ready 2 Yield<sup>®</sup> products (with a minimum of 30 comparisons per product) versus competitive Pioneer<sup>®</sup> and NK<sup>®</sup> brands with Roundup Ready<sup>®</sup>

#### ACCELERON<sup>®</sup> PROMOTES STRONG EARLY-SEASON GROWTH



#### ACCELERON® SEED APPLIED SOLUTIONS FOR CORN

Acceleron<sup>®</sup> Seed Applied Solutions help corn seedlings emerge strong by providing superior protection against seed and seedling diseases as well as early-season insects and pests. With protection from Acceleron<sup>®</sup> Seed Applied Solutions at planting, high-yielding seed develop more uniform, vigorous plant stands for high yield potential.

#### Insect and Disease Protection for Corn

**Insect Protection:** Protection from earlyseason pests such as wireworms, seedcorn maggots, white grubs, grape colaspis and black cutworms (suppression).

**Disease-Fighting Protection:** Excellent control of soilborne and seedborne disease, including *Fusarium*, *Rhizoctonia* and *Pythium*.

#### Poncho<sup>®</sup>/VOTiVO<sup>®</sup> for Corn, Soybeans and Cotton

Acceleron<sup>®</sup> Seed Applied Solutions paired with Poncho<sup>®</sup>/VOTiVO<sup>®</sup> helps protect against seed and seedling diseases and early-season pests.

- For corn: Offers a unique biological mode of action for nematode management. Protects against damage from a range of nematode species and early-season insects, from planting through early development.
- For soybeans: Can provide the maximum level of protection against seed and seedling diseases; early-season insects; and nematodes including soybean cyst, reniform and root-knot.
- For cotton: Controls early-season insects such as thrips and aphids, and also protects against damage from nematodes including reniform and root-knot.
- ► Two-Year Performance

for corn



Source: 2011 and 2012 Internal Monsanto Commercial Field Trials. Individual results may vary.

Poncho<sup>®</sup>/VOTiVO<sup>®</sup>





#### ECONOMICAL, CONSISTENT HERCULEX<sup>®</sup> YIELD PROTECTION

Herculex<sup>®</sup> Insect Protection technology helps top-performing hybrids achieve their highest performance potential.



#### HERCULEX® XTRA

Herculex<sup>®</sup> XTRA Insect Protection combines Herculex<sup>®</sup> I Insect Protection and Herculex<sup>®</sup> RW Rootworm Protection for powerful protection above- and belowground. It enables top-performing hybrids to reach their optimal yield potential by combining high-yielding genetics with consistent, season-long control of European corn borer, corn rootworm and black cutworm.

Herculex<sup>®</sup> XTRA is stacked with LibertyLink<sup>®</sup> technology, offering the ability to use a costeffective, alternative weed-control option such as Liberty<sup>®</sup> herbicide or a conventional herbicide program. Herculex<sup>®</sup> XTRA is an effective corn insect management trait option for greater profit potential.



#### **HERCULEX®** I

If you don't need corn rootworm protection, Herculex<sup>®</sup> I *Insect Protection* gives full-plant protection all season long against European corn borer, black cutworm and other yieldrobbing, aboveground pests. All Herculex<sup>®</sup> I hybrids contain LibertyLink<sup>®</sup> technology, making them resistant to over-the-top applications of Liberty<sup>®</sup> herbicide.

#### HERCULEX® XTRA AND HERCULEX® I DELIVER A WIDE WINDOW OF PROTECTION



#### CROP AND GRAIN MARKETING STEWARDSHIP

Dow AgroSciences is a member of Excellence Through Stewardship® (ETS). Dow AgroSciences products are commercialized in accordance with ETS product launch stewardship guidance and Dow AgroSciences Product Launch Stewardship Policy. No crop or material produced from this product can be exported to, used, processed or sold across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. For further information about your crop or grain marketing options, contact DAS at 877-4-TRAITS (877-487-2487). Information regarding the regulatory and market status of agricultural biotechnology products can be found at www.biotradestatus.com.

Properly managing trait technology is key to preserving it as a long-term crop protection tool. Growers who fail to comply with insect resistance management (IRM) requirements risk losing access to this product. To help preserve the effectiveness of B.t. corn technologies, growers planting B.t. corn technologies are required to follow an IRM Plan. Consult the Corn Product Use Guide for appropriate refuge configuration options. Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Technology Use Agreement and Product Use Guide. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements. For complete details on IRM requirements for hybrids with B.t. technology, including refuge examples and important information on the use of insecticides on refuge and B.t. corn acres, please consult the appropriate Product Use Guide. Go to www.corteva.us/Resources/ trait-stewardship.html to download the latest Dow AgroSciences Corn Product Use Guide. Herculex<sup>®</sup> Insect Protection technology by Dow AgroSciences and Pioneer<sup>®</sup> Hi-Bred. Herculex<sup>®</sup> and the Herculex<sup>®</sup> logo are trademarks of The Dow Chemical Company ("Dow") or an affiliated company of Dow. Bayer CropScience LP, 2 T.W. Alexander Drive, Research Triangle Park, NC 27709. Always read and follow label instructions. Liberty<sup>®</sup>, LibertyLink<sup>®</sup> and the Water Droplet Design are registered trademarks of Bayer. Liberty<sup>®</sup> is not registered in all states. For additional product information, call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at www.BayerCropScience.us.

1. Corn rootworm is only controlled with Herculex<sup>®</sup> XTRA Insect Protection. Follow IRM, grain marketing and all other stewardship practices and pesticide label directions.





#### BREAKTHROUGH AGRISURE<sup>®</sup> TRAIT TECHNOLOGY

Agrisure<sup>®</sup> traits deliver corn insect control, water optimization technology and outstanding herbicide tolerance to optimize the yield potential of elite hybrids.

#### AGRISURE ARTESIAN®

 Maximize yield potential when it rains and increase yield potential when it doesn't.

Built using scientifically selected genes, this elite class of high-performing hybrids can respond to water stress with multiple genes and at virtually any stage of growth - managing gaps in rainfall throughout the season. Artesian<sup>™</sup> corn hybrids can help manage the unpredictability of weather and improve yield consistency by converting water to grain more efficiently than other hybrids.

#### AGRISURE ARTESIAN® ADVANTAGE

#### AGRISURE VIPTERA®

 More control of more insects for more yield potential.

Agrisure Viptera<sup>®</sup> trait stacks provide the most comprehensive corn insect control, reducing insect feeding damage to ears and the subsequent development of molds and mycotoxins. By controlling major leaf-, stalkand ear-feeding corn insects, the Agrisure Viptera<sup>®</sup> trait offers better crop stands and lower levels of disease, resulting in increased yield and profit potential.

#### ► Agrisure Viptera® 3111

Above- and belowground insect control.

#### ► Agrisure Viptera® 3220 E-Z Refuge®

Dual modes of action against aboveground insects, with a 5% single-bag refuge.

Trait stacks containing the Agrisure Viptera® trait are also available in combination with Agrisure Artesian® technology for maximized yield in water-stressed environments.

### AGRISURE VIPTERA® TRAIT PERFORMANCE ON WESTERN BEAN CUTWORM<sup>1</sup>



Hybrid with the Agrisure Viptera<sup>®</sup> trait

Hybrid without the Agrisure Viptera<sup>®</sup> trait

1. Agrisure Viptera<sup>®</sup> on western bean cutworm vs. competitive hybrid. Sterling, Colo., 2014.



Elkville, Ill., 2012





## ACHIEVE REAL YIELDS WITH THE LIBERTYLINK<sup>®</sup> SYSTEM

The LibertyLink<sup>®</sup> trait and Liberty<sup>®</sup> herbicide offer a broad-spectrum weed-control program and an effective resistance-management tool.

Farmers can preserve the value of glyphosate-tolerant crops by rotating them to the LibertyLink® trait and Liberty® herbicide. This efficient system is the only alternative crop technology available that maintains the simplicity of glyphosate-tolerant crop systems while controlling a wide spectrum of broadleaf weeds and grasses, including weeds resistant to glyphosate and other herbicide classes.

## **Liberty**

#### LIBERTY<sup>®</sup> HERBICIDE

Liberty<sup>®</sup> herbicide delivers superior weed control across enabled trait systems, with greater application flexibility, unmatched convenience and no known resistance in U.S. row crops. Liberty<sup>®</sup> provides:

- 98% control of a broad spectrum of broadleaf weeds and grasses<sup>1</sup>
- Excellent control of resistant weeds, including key weeds like Palmer amaranth, waterhemp and marestail
- A unique herbicide site of action (Group 10), unlike any other active ingredient on the market<sup>2</sup>
- Plus, Liberty<sup>®</sup> is backed by the Liberty<sup>®</sup> Weed Control Guarantee

Talk to your retailer to learn how you can qualify for the Liberty<sup>®</sup> Guarantee as well as to learn more about your local S.T.O.P. Weeds application guidelines for maximum weed control.

#### LIBERTYLINK<sup>®</sup> SYSTEM



#### LibertyLink<sup>®</sup> Soybeans<sup>1</sup>

LibertyLink® soybeans provide \$33+/A more profit potential. With the 2+ bushel advantage over Asgrow® Roundup Ready 2 Xtend® soybeans, there is an \$18+/A profit potential on yield coupled with a \$15+/A potential in lower system input costs. That is smart math. The LibertyLink® system is simply the better solution for stronger yield and superior weed control.

#### ► LibertyLink<sup>®</sup> Corn

The LibertyLink<sup>®</sup> system enables growers to use powerful Liberty<sup>®</sup>, the only working nonselective herbicide that is effective on tough-to-control grasses and broadleaf weeds, for over-the-top use on over 50 million LibertyLink<sup>®</sup>-enabled corn hybrid acres with Herculex<sup>®</sup>, Genuity<sup>®</sup> SmartStax<sup>®</sup> and Agrisure<sup>®</sup> hybrids with corn-borer protection.<sup>2</sup> The LibertyLink<sup>®</sup> system is simply the better solution built upon high-performing genetics and superior weed control for a stronger yield.

1. Results based on five years of trials where Liberty<sup>®</sup> herbicide was applied according to S.T.O.P. Weeds with Liberty<sup>®</sup> herbicide guidelines and as part of a complete weed control program where an effective residual product was used, followed by Liberty<sup>®</sup> herbicide. Endorsement or recommendation by the universities is not implied. Seed costs based on survey of average trait pricing across the U.S. Herbicide costs based on 2017 grower pricing. No results guaranteed. Results may vary year to year and depending on rate of application, use, yield, geography, seed pricing and herbicide application costs.

2. The active ingredient in Liberty<sup>®</sup> is a Group 10 herbicide, which is the only broad-spectrum herbicide that effectively controls grasses and broadleaf weeds, and it has no known resistance in U.S. broadacre crops.

Seeds containing the LibertyLink<sup>®</sup> trait may be protected under one or more U.S. patents and may be planted only to produce one commercial crop in a single season, and only after signing a BASF Grower Technology Agreement. It is illegal to save seeds containing the LibertyLink<sup>®</sup> trait for use as planting seed or for transfer to others for use as planting seed.



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#### WITH HIGH- OR LOW-QUALITY FORAGES, CALIBRATE® TESTS DELIVER RELIABLE ACCURACY

Laboratory analysis can be less accurate when forage quality is not average. In the quality graphs below, the light bars represent where fiber and starch digestibility is either high or low. The analysis accuracy of these extremes is financially critical to forage growers and dairy farmers. Calibrate<sup>®</sup> forage quality tests maintain their accuracy as feeds drift toward the extremes.



#### CALIBRATE® PATENTED FORAGE QUALITY TESTS OFFER EXCEPTIONAL DIGESTIBILITY INFORMATION

Calibrate<sup>®</sup> technology provides forage analysis testing with improved accuracy for forages of all qualities. Designed to eliminate the necessity of an in vitro analysis (wet chem), Calibrate<sup>®</sup> forage analysis tests were developed using in vitro results from over 125,000 samples and 15 years of research, representing a wide range of forage quality from across the U.S. The volume of samples tested and the emphasis on samples of extreme quality (high and low) make Calibrate<sup>®</sup> forage analysis more precise.

For more information, contact your local WinField United representative or go to www.calibratetechnologies.com.



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#### CALIBRATE<sup>®</sup> TECHNOLOGIES

#### **KNOW THE QUALITY OF YOUR FORAGES**

Variation in any dairy feeding program can cause underperformance: lost milk production, lower feed efficiency and lower profit potential. Calibrate® fiber and starch quality tests are designed to reduce the impact of nutrition variation in feedstuffs and allow more value to be obtained from forages, grown or purchased.

Calibrate<sup>®</sup> patented forage quality tests are designed to:

- · Feed homegrown forages more effectively.
- Assist in making informed decisions when purchasing hay.
- Enable and assist your nutritionist to further improve rations.
- Confidently feed highly digestible forages in the ration and maximize ROI potential.
- Get optimal performance out of lowerquality forages.
- Determine if forage quality is a limiting factor to milk production.
- Provide more peace of mind because better decisions are made with available feedstuffs.





#### THE KEMIN<sup>®</sup> NUTRISAVE<sup>®</sup> SYSTEM HELPS OPTIMIZE FORAGE QUALITY

The Kemin<sup>®</sup> NutriSAVE<sup>®</sup> Forage Management System is a complete forage management approach to retaining quality in the forages you grow for use in dairy or beef production. The products and support offered through the NutriSAVE<sup>®</sup> System aid producers in helping preserve forage quality by reducing shrinkage and spoilage, resulting in better nutrition. The NutriSAVE<sup>®</sup> System includes management recommendations from harvest to storage and through feeding. The system's crop- and condition-specific products include the latest technology and are backed by current research and experts in the forage management field.

#### **ACID-BASED PRODUCTS**

- Fresh CUT\* Plus Liquid Hay Preservative Applied to hay baled at up to 25% moisture. The blend of acids helps control the growth of mold and wild yeast, preventing bale heating and preserving nutrients.
- Silage SAVOR<sup>®</sup> Plus Liquid and Silage SAVOR<sup>®</sup> Dry Silage Preservatives These forage preservatives are applied to ensiled crops before storage. The acid blends are used to prevent mold and wild yeast growth, allowing for improved fermentation.
- Myco CURB<sup>®</sup> Liquid and Dry Mold Inhibitors

Designed to prevent mold growth on stored grain, feed and feed ingredients. For more than 35 years, Myco CURB® has been the gold standard for mold control.

 Ultra CURB<sup>®</sup> Liquid and Dry Mold Inhibitors

These products contain a powerful blend of four organic acids designed to control heating in total mixed rations (TMRs).

#### INOCULANTS

- Kem LAC<sup>®</sup> HD Bacterial Inoculant
   A blend of three lactic-acid-producing bacteria to rapidly drop the pH of ensiled crops. Applied to all ensiled crops before storage, Kem LAC<sup>®</sup> HD helps speed fermentation for better dry matter retention.
- Kem LAC<sup>®</sup> LB 500 Bacterial Inoculant This combination product contains two strains of bacteria, one for producing high levels of lactic acid and a second to produce acetic acid. The result is better aerobic stability of the TMR during feedout.

#### BENEFITS OF THE NUTRISAVE® PROGRAM AND PRODUCTS

The minute forages are harvested, the race against time begins. The crop quickly deteriorates after cutting, and the quality CROPLAN® seed that was so carefully selected can fail to deliver the nutrients expected without proper preservation. Forage quality can have a huge impact on your operation's profitability and performance. That is why generating the most value from the forages you grow is important. High-quality forage optimizes productivity and herd health.

The NutriSAVE® Forage Management System features both acid-based and inoculantbased solutions. The Kem LAC® line of silage inoculants is designed to work on a wide variety of forages. The blended organic acid products work to reduce mold and wild yeast growth to widen harvest windows, enhance fermentation and increase aerobic stability, both before and after storage. The flexibility to offer the ideal solution for nearly every forage management challenge is why producers have relied on the NutriSAVE® Forage Management System for decades.

#### KEY FEATURES OF USING NUTRISAVE® PRODUCTS

- Acid- and bacterial-based products for all forage applications.
- Helps reduce shrinkage and spoilage of dry matter.
- Reduces growth of mold and wild yeast.
- · Promotes faster fermentation or curing.
- Extends aerobic stability at feedout.
- Supports optimal animal performance.

#### PROVEN PERFORMANCE WITH NUTRISAVE® PRODUCTS AND PROGRAMS

Extensive laboratory, university and field trials show that NutriSAVE® products can outperform other additives. By using the tools and resources available, NutriSAVE® programs can help you achieve a greater potential return on your forage investment. For more information about the Kemin® NutriSAVE® Forage Management System, talk with your WinField United representative or contact Kemin® at KeminAg@kemin.com or 515-559-5304. Additional product details are available online at kemin.com/feedquality.

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#### PROPER MANAGEMENT PROTECTS TECHNOLOGY'S VALUE

Sound management practices and compliance with stewardship requirements will help protect the benefits and value of biotech trait seed technology for future generations.

#### THINK BEFORE YOU USE BIN-RUN SEED

#### Verification Required

The last patent on the original Roundup Ready<sup>®</sup> soybean trait expired a few years ago, and U.S. farmers may legally plant saved seed from some varieties of soybean containing the Roundup Ready<sup>®</sup> soybean trait. However, it is important that you check with your seed supplier to determine if a specific Roundup Ready<sup>®</sup> soybean variety is covered by other intellectual property rights and, if so, the policy for saving seed of that variety.

#### Higher Seeding Rate

A higher seeding rate may be required for binrun Roundup Ready<sup>®</sup> soybeans compared to new branded seed.

#### Yield Loss

Roundup Ready 2 Yield<sup>®</sup> soybean varieties and Roundup Ready 2 Xtend<sup>®</sup> soybean varieties typically have a higher yield opportunity than Roundup Ready<sup>®</sup> soybean varieties.<sup>1</sup>

#### Cleanout Loss

Loss of seed and/or shrink occurs during the seed cleaning and handling processes for bin-run seed.

#### Seed Treatment Costs

Treating your seed will add costs – both the cost of the treatment and the application of that treatment.

#### Lost Income

Every bushel of saved seed you plant is a bushel you're not selling as commodity grain.

#### Increased Seed Management

If you plan to save and bin-run Roundup Ready<sup>®</sup> soybeans for planting, you will have to manage your harvest operations and grain storage so that the seed isn't commingled with other seed that's covered by intellectual property rights.

#### HIGH VALUE OF NEW BRANDED SEED

- Latest Technology
- High-yielding soybean technologies
- Better variety options
- · Leading seed treatment options
- ► Customer Service
- Dealer agronomic support before and after the sale
- · Replant policy support
- · Convenient packaging and delivery
- ► Reliable Germination and Quality
- Rigorously tested for quality and meets U.S. Federal Seed Act requirements
- Free of seedborne diseases
- · Properly stored and conditioned

#### SOYBEAN AND CANOLA PIRACY

Seed containing a patented trait can only be used to plant a single commercial crop from which seed cannot be saved and replanted. Examples of seed containing a patented trait include but are not limited to Roundup Ready 2 Yield<sup>®</sup> soybeans, Roundup Ready 2 Xtend<sup>®</sup> soybeans, Roundup Ready<sup>®</sup> spring canola and Roundup Ready<sup>®</sup> winter canola. Additional information and limitations on the use of these products are provided in the Monsanto Technology Stewardship Agreement and the Monsanto Technology Use Guide. U.S. patents for Monsanto technologies can be found at the following webpage: http://www.monsantotechnology.com.

#### **INSECT RESISTANCE MANAGEMENT**

Insect-protected crops are genetically improved to provide in-plant protection against selected insect pests. Beneficial insects are not affected. To preserve the benefits and insect protection of these technology crops, Monsanto Technology LLC, Syngenta Crop Protection and Dow AgroSciences have developed IRM guidelines that must be incorporated by everyone purchasing and planting insectprotected crops.

#### **CORN REFUGE OPTIONS**

The refuge on each farm may be arranged in a number of configurations. These options offer the flexibility to easily incorporate an effective corn refuge into farm operations. Options include the following:

- Plant a corn refuge as a block within a traited cornfield.
- Split the planter to alternate at least four consecutive rows of corn refuge with traited corn.
- Plant field perimeters or end rows to a corn refuge.
- See product tag for specific refuge configurations.

1. Roundup Ready 2 Yield<sup>®</sup> soybeans and Roundup Ready 2 Xtend<sup>®</sup> soybeans are covered by different patents than original Roundup Ready<sup>®</sup> soybeans and cannot be saved and planted. For more information about seed innovation and intellectual property protection, please visit www.seedipalliance.com.





#### CORN INSECT RESISTANCE MANAGEMENT OVERVIEW<sup>1</sup>

QUICK COMPLIANCE GUIDE FOR DEALERS AND FARMERS

#### 1 REFUGE SIZE

Plant the correct size refuge for the area and corn product.

#### ► The Corn-Growing Area

- 20% required for some B.t. products, such as VT Triple PRO<sup>®</sup> (20 acres of refuge for every 80 acres of B.t.)
- 5% only for SmartStax<sup>®</sup> and VT Double PRO<sup>®</sup> (5 acres of refuge for every 95 acres of B.t.)

#### The Cotton-Growing Area

 20% only for SmartStax<sup>®</sup>, VT Triple PRO<sup>®</sup> and VT Double PRO<sup>®</sup> (20 acres of refuge for every 80 acres of B.t.)

#### 2 REFUGE LOCATION

Plant the required refuge within each field that contains B.t. insect-protected corn. There are other options, but an in-field refuge is always accepted. The refuge should always be a minimum of four contiguous rows wide.



#### **3** REFUGE PLANTING

In each field, plant your refuge first before planting any insect-protected corn. This will ensure that the minimum refuge size requirement is met should unforeseen circumstances (e.g., adverse weather) alter your planting schedule and strategy. Use a refuge product that contains no B.t. insect-protection traits (e.g., Roundup Ready<sup>®</sup> or conventional corn are acceptable). Growers must read the IRM/Grower Guide for complete refuge planting requirements.

#### 4 TREATMENT

If you need to treat your refuge with a non-B.t. foliar insecticide, you may have to treat the B.t. technology in a similar manner. Growers must read the IRM/Grower Guide for complete treatment options.

Refuge

#### **COMMON REFUGE CONFIGURATIONS**

Traited corn hybrid<sup>2</sup>

#### ► In-Field Configuration Examples

SEPARATE REFUGE CONFIGURATIONS



Minimum of four rows

#### Adjacent-Field Configuration Examples



└─' ≤ 1/2 mile

Separated by road, path, ditch, etc., but not by another field



1. Provided as a summary only. Farmers must read the IRM/Grower Guide prior to planting for important information on planting and insect resistance management.

2. Traited = B.t., RW or B.t./RW.





#### **REFUGE REQUIREMENTS FOR BIOTECH CORN PRODUCTS<sup>1, 2</sup>**

	% NON-B.T. REFUGE	CONFIGURATIONS	REFUGE LOCATION
SMARTSTAX <sup>®</sup> RIB COMPLETE <sup>®</sup> CORN BLEND <sup>3</sup>	5% in the bag	-	No separate planted refuge is required
VT DOUBLE PRO® RIB COMPLETE® CORN BLEND	5% in the bag	_	No separate planted refuge is required
DROUGHTGARD* HYBRIDS WITH VT DOUBLE PRO* RIB COMPLETE* CORN BLEND	5% in the bag	-	No separate planted refuge is required
SMARTSTAX <sup>®</sup> CORN <sup>3</sup>	5% corn-growing areas; 20% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within or adjacent to SmartStax <sup>®</sup> field; if adjacent, may be separated by a road, path, ditch, etc., but not another field
VT DOUBLE PRO® CORN	5% corn-growing areas; 20% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within, adjacent to or within 1/2 mile from VT Double $\text{PRO}^{\circledast}$ field
AGRISURE VIPTERA®	20% corn-growing areas	Block, Perimeter, Strips, Adjacent	Within or adjacent to Agrisure Viptera <sup>®</sup> field; if adjacent, may be separated by a road, path, ditch, etc., but not another field
AGRISURE® 3000GT, AGRISURE® CB/LL/RW	20% corn-growing areas; 50% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within or adjacent to Agrisure <sup>®</sup> 3000GT or Agrisure <sup>®</sup> CB/LL/RW field; if adjacent, may be separated by a road, path, ditch, etc., but not another field
AGRISURE® GT/CB/LL, AGRISURE® CB/LL	20% corn-growing areas; 50% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within, adjacent to or within 1/2 mile from Agrisure $^{\ensuremath{\mathbb{B}}}$ GT/CB/LL or Agrisure $^{\ensuremath{\mathbb{B}}}$ CB/LL field
HERCULEX <sup>®</sup> XTRA <i>INSECT PROTECTION</i>	20% corn-growing areas; 50% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within or adjacent to Herculex <sup>®</sup> XTRA field; if adjacent, may be separated by a road, path, ditch, etc., but not another field
HERCULEX® I INSECT PROTECTION	20% corn-growing areas 50% cotton-growing areas	Block, Perimeter, Strips, Adjacent	Within, adjacent to or within 1/2 mile from $\operatorname{Herculex}^{{\mathbb R}}$ field

All refuge configurations require a minimum of four rows.
 Provided as a summary only. Farmers must read the IRM/Grower Guide prior to planting.
 SmartStax<sup>®</sup> RIB Complete<sup>®</sup>, VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> and DroughtGard<sup>®</sup> Hybrids with VT Double PRO<sup>®</sup> RIB Complete<sup>®</sup> corn blends are each a blend of 95% traited seed and 5% refuge seed interspersed in the bag and do not require a separate structured refuge in corn-growing areas.



#### **EXCELLENCE THROUGH STEWARDSHIP**

Monsanto Company and Forage Genetics International, LLC are members of Excellence Through Stewardship® (ETS). Their respective products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with their respective Policies for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. Only commercialized products have been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

#### **INSECT RESISTANCE MANAGEMENT** IMPORTANT IRM INFORMATION: Always

read and follow IRM requirements. Insectprotected crops are genetically improved to provide in-plant protection against selected insect pests. Beneficial insects are not affected. To preserve the benefits and insect protection of these technology crops, Monsanto Technology LLC, Syngenta Crop Protection and Dow AgroSciences have developed insect resistance management (IRM) guidelines that must be incorporated by everyone purchasing and planting insect-protected crops.

#### IMPORTANT IRM INFORMATION: RIB Complete®

corn blend products do not require the planting of a structured refuge except in the Cotton-Growing Area where corn earworm is a significant pest. SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend is not allowed to be sold for planting in the Cotton-Growing Area.

## See the IRM/Grower Guide for additional information. Always read and follow IRM requirements.

In DroughtGard<sup>®</sup> Hybrids with RIB Complete<sup>®</sup> corn blend, the refuge seed may not always contain DroughtGard<sup>®</sup> Hybrids trait. RIB Complete<sup>®</sup> corn blend products do not require the planting of a structured refuge except in the Cotton-Growing Area where corn earworm is a significant pest. SmartStax<sup>®</sup> RIB Complete<sup>®</sup> corn blend is not allowed to be sold for planting in the Cotton-Growing Area. See the IRM/Grower Guide for additional information.

#### Important: Always read and follow label and bag tag instructions; only those labeled as tolerant to glufosinate may be sprayed with glufosinate ammonium based herbicides.

Agrisure<sup>®</sup> Technology incorporated into these seeds is commercialized under license from Syngenta Seeds, Inc. Herculex<sup>®</sup> Technology incorporated into these seeds is commercialized under license from Dow AgroSciences LLC. HERCULEX<sup>®</sup> and the HERCULEX shield are registered trademarks of Dow AgroSciences LLC.

Seed products with the LibertyLink<sup>®</sup> (LL) trait are resistant to the herbicide glufosinate ammonium, an alternative to glyphosate in corn, and combine highyielding genetics with the powerful, non-selective, postemergent weed control of Liberty<sup>®</sup> herbicide for optimum yield and excellent weed control. LibertyLink<sup>®</sup>, Liberty<sup>®</sup> and the Water Droplet logo are registered trademarks of BASF Corporation.

B.t. products may not yet be registered in all states. Check with your representative for the registration status in your state.

### PLANTING REFUGE, PRESERVING TECHNOLOGY

Before opening a bag of seed, be sure to read and understand the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed set forth in the technology agreement that you sign. By opening and using a bag of seed, you are reafirming your obligation to comply with those stewardship requirements.



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, **including applicable refuge requirements for insect resistance management**, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology/Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.





#### **GENERAL DISCLAIMERS**

Performance may vary from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the growers' fields.

Important: Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status.

ALWAYS READ AND FOLLOW DIRECTIONS FOR USE ON PESTICIDE LABELING. IT IS A VIOLATION OF FEDERAL AND STATE LAW to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans and cotton with XtendFlex® Technology. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Roundup Ready 2 Xtend® soybeans and cotton with XtendFlex® Technology.

Roundup Ready 2 Xtend<sup>®</sup> soybeans and cotton with Xtend Flex<sup>®</sup> Technology contain genes that confer tolerance to glyphosate and dicamba. Cotton with Xtend Flex<sup>®</sup> Technology also contains genes that contain glufosinate. Nonselective herbicides, glyphosate, glufosinate and dicamba will kill crops that are not specifically tolerant to that herbicide. Contact your Monsanto dealer or refer to Monsanto's Technology Use Guide for recommended weed control programs.

Roundup Ready<sup>®</sup> Technology contains genes that confer tolerance to glyphosate, an active ingredient in Roundup<sup>®</sup> brand agricultural herbicides. Agricultural herbicides containing glyphosate will kill crops that are not tolerant to glyphosate.

#### COTTON

Bollgard<sup>®</sup> 3 XtendFlex<sup>®</sup> cotton and Bollgard II<sup>®</sup> XtendFlex<sup>®</sup> cotton contain genes that confer tolerance to glyphosate, dicamba and glufosinate. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Glufosinate will kill crops that are not tolerant to glufosinate. Contact your Monsanto dealer or refer to Monsanto's Technology Use Guide for recommended weed control programs. Insect control technology provided by **Vip3A** is utilized under license from Syngenta Crop Protection AG.

#### IMPORTANT NOTICE CONCERNING ROUNDUP READY XTEND® CROP SYSTEM AND XTENDIMAX® HERBICIDE WITH VAPORGRIP® TECHNOLOGY

This notice updates or amends the information contained in this publication.

A 9th Circuit court ruling dated June 3rd, 2020, vacated the registration for XtendiMax<sup>®</sup> herbicide with VaporGrip<sup>®</sup> technology and certain other low-volatility dicamba products. The EPA is currently reviewing Bayer's submission in support of a new registration for XtendiMax<sup>®</sup> herbicide for the 2021 season and beyond. Bayer's submission included multiple new data and analyses, including by independent academics, which will allow EPA to make a science-based decision on a new XtendiMax<sup>®</sup> herbicide registration. Visit Bayer's XtendiMax<sup>®</sup> herbicide updates page for the latest information on the current registration status of XtendiMax<sup>®</sup> herbicide at

www.roundupreadyxtend.com/xtendimaxupdates

Please know that, despite the challenges, Bayer stands fully behind XtendiMax<sup>®</sup> herbicide and will continue working with the EPA, growers, academics, and others to provide long-term access to this important herbicide.

However, no dicamba may be used in-crop with seed in the Roundup Ready<sup>®</sup> Xtend Crop System, unless and until approved or specifically permitted by the U.S. EPA and the appropriate state agency for such use. As of July 13, 2020, no dicamba formulations are currently registered by the U.S. EPA for in-crop use with seed in the Roundup Ready® Xtend Crop System in the 2021 season. Current stocks of lowvolatility dicamba herbicides XtendiMax® herbicide, Engenia<sup>®</sup> herbicide, and FeXapan<sup>®</sup> herbicide previously approved for in-crop use with seed in the Roundup Ready® Xtend Crop System may not be used after July 31, 2020. Dicamba may harm crops that are not tolerant to dicamba. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with seed in the Roundup Ready<sup>®</sup> Xtend Crop System.

#### NOTICE: DO NOT APPLY ANY HERBICIDE TO SEED IN THE ROUNDUP READY<sup>®</sup> XTEND CROP SYSTEM UNLESS IT HAS A PRODUCT LABEL SPECIFICALLY AUTHORIZING THAT USE. TO USE A HERBICIDE IN ANY MANNER INCONSISTENT WITH ITS LABELING IS A

VIOLATION OF FEDERAL LAW. REFER TO THE BAYER TECHNOLOGY USE GUIDE FOR DETAILS AND RECOMMENDATIONS ON USING APPROVED HERBICIDES ON SEED IN THE ROUNDUP READY<sup>®</sup> XTEND CROP SYSTEM.

#### SOYBEAN AND CANOLA PIRACY

Seed containing a patented trait can only be used to plant a single commercial crop from which seed cannot be saved and replanted. Examples of seed containing a patented trait include but are not limited to Genuity<sup>®</sup> Roundup Ready 2 Yield<sup>®</sup> soybeans, Roundup Ready 2 Xtend<sup>®</sup> soybeans, Genuity<sup>®</sup> Roundup Ready<sup>®</sup> spring canola and Genuity<sup>®</sup> Roundup Ready<sup>®</sup> winter canola. Additional information and limitations on the use of these products are provided in the Monsanto Technology Stewardship Agreement and the Monsanto Technology Use Guide. U.S. patents for Monsanto technologies can be found at the following webpage: http://www.monsantotechnology.com.

#### ALFALFA

HarvXtra<sup>®</sup> Alfalfa with Roundup Ready<sup>®</sup> Technology: Purchase and use of HarvXtra® Alfalfa with Roundup Ready<sup>®</sup> Technology is subject to a Seed and Feed Use Agreement, requiring that products of this technology can only be used on farm or otherwise be used in the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. In addition, due to the unique cropping practices do not plant HarvXtra® Alfalfa with Roundup Ready<sup>®</sup> Technology in Imperial County, California, pending import approval and until Forage Genetics International, LLC (FGI) grants express permission for such planting. HarvXtra® Alfalfa with Roundup Ready<sup>®</sup> Technology has pending import approvals. GROWERS MUST DIRECT ANY PRODUCT PRODUCED FROM HARVXTRA® ALFALFA WITH ROUNDUP READY<sup>®</sup> TECHNOLOGY SEED OR CROPS (INCLUDING HAY AND HAY PRODUCTS) ONLY TO UNITED STATES DOMESTIC USE. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted.

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