



**YOU GET WHAT  
YOU PLANT FOR**

— **20** SEED GUIDE **24** —



**Whether you plant conventional seed or varieties with trailblazing traits, make W-L Alfalfas® your partner**

**THE LEGACY** of W-L Alfalfas is second to none. For more than 60 years, we have stayed committed to a singular focus: to produce high-quality alfalfa seed that helps improve various production goals for alfalfa growers.

A lot has changed since 1958, but our commitment to farmers across the world is that they benefit from improved alfalfa varieties that span the entire spectrum of dormancies, technologies and traits. "Better Seed Through Research" has been our slogan since our inception, and while research and development remains the backbone of everything we do, we maintain a "grower first" attitude in delivering the highest-performance alfalfa varieties.

There are various cornerstones in our rich history, from our first HQ™ (High Quality) selected variety to demonstrate increased milk production potential, to HopperShield™ varieties with some of the industry's best potato leafhopper resistance, to Roundup Ready® alfalfa varieties with vast benefits in establishment and high efficacy weed control in-crop giving growers cleaner, higher producing stands, to

now, realizing truly game-changing technology with W-L Alfalfas branded varieties that include the HarvXtra® Alfalfa with Roundup Ready® technology trait, giving growers tremendous value with the flexibility to substantially higher fiber digestibility and feed value, or increasing dry matter yield potential by delaying cutting frequency, without sacrificing forage quality.

While the past and present are exciting to say the least, our future remains fueled by our research and desire to improve genetics and trait offerings to advance forage quality and yield potential, true to our forward-looking spirit. Building on a rich heritage of innovation, in 2001, W-L Alfalfas became part of the Forage Genetics International breeding program to create one of the industry's largest alfalfa research and development programs in the world. Though more than 60 years has passed since our beginning, the mission Ward Waterman and Harold Loomis started in 1958 remains the same, to deliver breakthrough products farmers need to meet increased demands on a global scale.

# TABLE OF CONTENTS

DORMANT	FALL DORMANCY	PAGE
WL 336HQ.RR	3.2	3 - 4
WL 319HQ	2.8	5 - 6
WL 3311HQ	3.4	7 - 8
WL 3471.HVXRR	4.3	9 - 10
WL 3451HQ.RR	4.4	11 - 12
WL 3441HQ.RR	4.3	13 - 14
WL 3440.RR Brand	4.0	15 - 16
PowerStand® RR Brand	4.0	17 - 18
WL 359LH.RR	3.9	19 - 20
WL 349HQ	4.4	21 - 22
WL 358LH	4.1	23 - 24
WL 375HVX.RR	4.6	25 - 26
WL 372HQ.RR	4.9	27 - 28
WL 3546HQ.RR	5.0	29 - 30
WL 365HQ	4.9	31 - 32
WL 3521HQ	5.0	33 - 34
WL 377HQ	5.0	35 - 36
SEMI-DORMANT		
HVX3686RR Brand	6.0	37 - 38
WL 458HQ.RR	6.0	39 - 40
WL 467HQ	6.0	41 - 42
NON-DORMANT		
HVX840RR Brand	7.9	43 - 44
WL 558HQ.RR	8.0	45 - 46
WL 3847HQ.RR Brand	8.3	47 - 48
WL 538HQ	8.0	49 - 50
WL 3979.HVXRR Brand	9.0	51 - 52
WL 668HQ.RR	9.3	53 - 54
WL 3968HQ.RR Brand	9.3	55 - 56
WL 656HQ	9.3	57 - 58
EDUCATION		
Seed Traits & Technology Chart		1 - 2
Seed Treatments & Coatings		59 - 61
Seed Technology		62 - 64



# AGRONOMIC TRAITS

	Fall Dormancy	Winterhardness	Ultracut™ Disease Package	HarvXtra® Alfalfa	Roundup Ready® Technology	Hopper Shield	Wet Soil Tolerance*	Multileaf Expression	Disease Resistance Index	Salt Tolerance
<b>DORMANT</b>										
WL 336HQ.RR	3.2	1.0			☑		—	High	34/35	G
WL 319HQ	2.8	1.3					—	Very High	30/30	—
WL 331HQ	3.4	1.0	☑				Excellent	Very High	40/40	G
WL 3471.HVXRR	4.3	1.9	☑	☑	☑		Excellent	Very High	39/40	G
WL 3451HQ.RR	4.4	1.4	☑		☑		Excellent	Very High	40/40	G
WL 3441HQ.RR	4.3	2.0			☑		Excellent	Very High	35/35	G
WL 3440.RR Brand	4.0	2.0			☑		Good	High	34/35	G
PowerStand® RR Brand	4.0	2.0			☑		—	High	28/30	—
WL 359LH.RR	3.9	2.2			☑	☑	—	High	34/35	—
WL 349HQ	4.4	1.7	☑				Excellent	Very High	40/40	G
WL 358LH	4.1	2.0				☑	—	Very High	34/35	—
WL 375HVX.RR	4.6	2.1	☑	☑	☑		Excellent	Very High	39/40	G
WL 372HQ.RR	4.9	1.8			☑		—	Very High	34/35	G
WL 3546HQ.RR	5.0	1.4	☑		☑		Excellent	—	40/40	G
WL 365HQ	4.9	1.1					—	Very High	34/35	G
WL 3521HQ	5.0	1.8	☑				Excellent	Very High	40/40	G
WL 377HQ	5.0	2.5					—	Very High	30/30	G
<b>SEMI-DORMANT</b>										
HVX3686RR Brand	6.0	—		☑	☑		—	—	—	—
WL 458HQ.RR	6.0	—			☑		—	Moderate	—	G
WL 467HQ	6.0	—					—	Moderate	—	G
<b>NON-DORMANT</b>										
HVX840RR Brand	7.9	—		☑	☑		—	—	—	G
WL 558HQ.RR	8.0	—			☑		—	—	—	G
WL 3847HQ.RR Brand	8.3	—			☑		—	—	—	G
WL 538HQ	8.0	—					—	—	—	G
WL 3979.HVXRR Brand	9.0	—		☑	☑		—	—	—	G
WL 668HQ.RR	9.3	—			☑		—	—	—	G
WL 3968HQ.RR Brand	9.3	—			☑		—	—	—	G
WL 656HQ	9.3	—					—	—	—	G

G = Germination

\*High Tolerance to Multi-Race Aphanomyces and Phytophthora Root Rot disease pressure found in saturated and compacted soils. This does not refer to plants submerged under water.

<sup>1</sup>Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

<sup>2</sup>Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

# PEST RESISTANCE TRAITS

## DORMANT

	Bacterial Wilt	Fusarium Wilt	Verticillium Wilt	Anthraxnose (Race 1)	Anthraxnose (Race 5)	Phytophthora Root Rot	Aphanomyces (Race 1)	Aphanomyces (Race 2)	Evolving Aphanomyces Strains <sup>2</sup>	Pea Aphid	Spotted Alfalfa Aphid	Stem Nematode	Southern Root-Knot Nematode	Northern Root-Knot Nematode	Potato Leafhopper
WL 336HQ.RR	HR	HR	HR	HR	—	HR	HR	R	—	HR	R	MR	—	—	—
WL 319HQ	HR	HR	HR	HR	—	HR	HR	—	—	R	R	MR	—	—	—
WL 331HQ	HR	HR	HR	HR	HR	HR	HR	HR	HR	R	R	R	—	—	—
WL 3471.HVXRR	HR	HR	HR	HR	R	HR	HR	HR	HR	R	—	R	—	—	—
WL 3451HQ.RR	HR	HR	HR	HR	HR	HR	HR	HR	HR	R	R	R	—	—	—
WL 3441HQ.RR	HR	HR	HR	HR	—	HR	HR	HR	R	R	R	HR	—	—	—
WL 3440.RR Brand	HR	HR	HR	HR	—	HR	HR	R	—	R	—	R	—	—	—
PowerStand® RR Brand	HR	HR	HR	R	—	HR	R	—	—	—	—	—	—	—	—
WL 359LH.RR	HR	HR	HR	HR	—	HR	HR	R	—	R	R	R	—	—	HR
WL 349HQ	HR	HR	HR	HR	HR	HR	HR	HR	HR	HR	—	R	—	—	—
WL 358LH	HR	HR	HR	HR	—	HR	HR	R	—	HR	—	R	—	—	HR
WL 375HVX.RR	HR	HR	HR	HR	R	HR	HR	HR	HR	R	R	HR	—	—	—
WL 372HQ.RR	HR	HR	HR	HR	—	HR	HR	R	—	R	HR	HR	—	—	—
WL 3546HQ.RR	HR	HR	HR	HR	HR	HR	HR	HR	HR	R	R	R	—	—	—
WL 365HQ	HR	HR	HR	HR	—	HR	HR	R	—	HR	HR	R	—	—	—
WL 3521HQ	HR	HR	HR	HR	HR	HR	HR	HR	HR	R	HR	R	—	—	—
WL 377HQ	HR	HR	HR	HR	—	HR	HR	—	—	HR	HR	HR	—	HR	—

## SEMI-DORMANT

HVX3686RR Brand	MR	HR	—	R	—	HR	R	—	—	HR	HR	R	—	—	—
WL 458HQ.RR	HR	HR	HR	HR	—	HR	HR	—	—	HR	R	HR	—	—	—
WL 467HQ	HR	HR	R	HR	—	HR	R	—	—	HR	R	HR	—	HR	—

## NON-DORMANT

HVX840RR Brand	R	HR	—	R	—	R	—	—	—	HR	R	HR	—	—	—
WL 558HQ.RR	HR	HR	R	R	—	HR	—	—	—	HR	HR	R	—	—	—
WL 3847HQ.RR Brand	R	R	—	R	—	HR	—	—	—	HR	HR	HR	—	—	—
WL 538HQ	R	HR	R	HR	—	HR	MR	—	—	HR	HR	HR	—	—	—
WL 3979.HVXRR Brand	MR	HR	R	HR	—	HR	—	—	—	HR	HR	R	—	—	—
WL 668HQ.RR	HR	HR	R	HR	—	HR	—	—	—	HR	HR	HR	—	HR	—
WL 3968HQ.RR Brand	R	HR	—	HR	—	HR	R	—	—	R	HR	HR	—	—	—
WL 656HQ	MR	HR	HR	R	—	HR	—	—	—	HR	HR	HR	HR	—	—

## RESISTANCE RATINGS

% Resistant Plants	Resistance Class	Class Abbreviation
0-5	Susceptible	S
6-14	Low Resistance	LR
15-30	Moderate Resistance	MR
31-50	Resistance	R
50+	High Resistance	HR

## Achieve solid yield potential and exceptional winterhardiness in shorter growing season environments

Satisfying the needs of shorter-season growers, WL 336HQ.RR combines solid yield potential with industry-leading winterhardiness, all backed with the "HQ" high-quality forage designation. WL 336HQ.RR is an ideal pick for dairy, beef, or cash hay growers looking to maximize profit potential while utilizing the Roundup Ready® weed control system in alfalfa.

### WL 336HQ.RR Advantages

- Quick regrowth in a FD3, that delivers potential for high yields and long stand life
- Extremely winterhardy (WH=1.0); delivers excellent cold tolerance even under harsh weather conditions
- The HQ brand is proven to "hold" forage quality over a longer period of time; WL 336HQ.RR supports higher forage quality and greater harvest flexibility when harvest is delayed
- Disease resistance index (DRI) of 34/35 and strong resistance to insects and nematodes provide for solid yield potential and long stand life across a wide range of soil types and climates
- Dark green, fine-stemmed and highly digestible
- Improved salt tolerance of germinating seeds similar to tolerant check
- Outstanding winterhardiness allows intensive harvest management for maximum quality and yield potential without sacrificing stand life in Northern Plains, Upper Midwest, Northeast or Pacific Northwest regions

### WL 336HQ.RR Forage Quality Analysis\*

Variety	CP	IVTD	RFQ
<b>WL 336HQ.RR</b>	<b>21.0</b>	<b>77.0</b>	<b>159</b>
HybriForce-2400	19.9	74.7	144
Attention II	20.3	74.8	152
54H11	20.1	73.9	136

CP= Crude Protein    IVTD = In Vitro True Digestibility    RFQ = Relative Forage Quality

### Planting WL 336HQ.RR alfalfa and utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

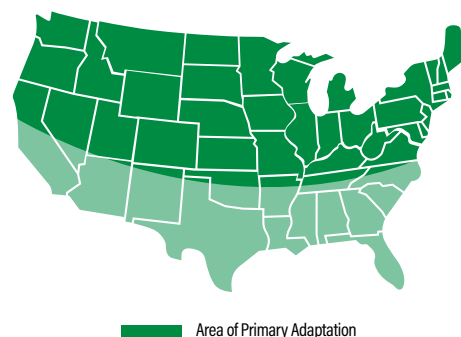
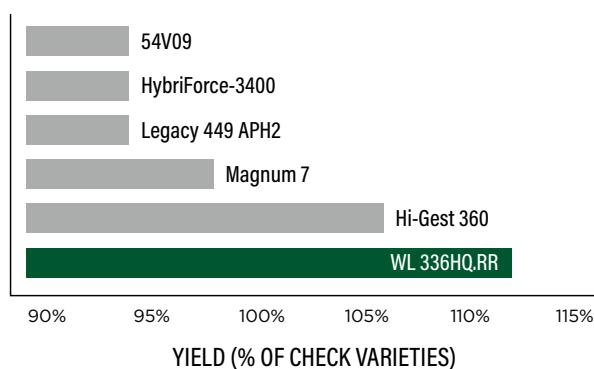
- Weed control at both stand establishment and in established stands means fewer weeds and higher quality hay and haylage, which can result in more milk and beef per acre
- Optimal crop safety at all growth stages provides increased yield potential in both the establishment and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank-mix; one herbicide does it all
- Flexibility in timing of application allows growers to spray when necessary; minimal carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding

AGRONOMIC TRAITS	
Fall Dormancy	3.2
Winterhardiness	1.0
Maturity	Medium
Digestibility	Excellent
Recovery After Harvest	Fast
Standability	Excellent
Multileaf Expression	High
Disease Resistance Index	34/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	Resistance
Leaf Disease	High Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	Moderate Resistance

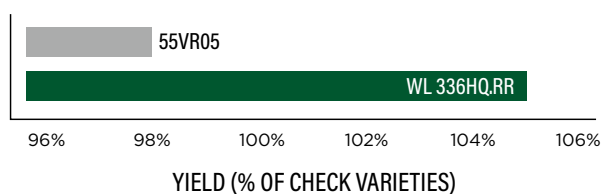
## WL 336HQ.RR Outyields the Competition in the East\*

### WEST SALEM, WI 2018-2020



## WL 336HQ.RR Outyields the Competition in the West\*

### WA 2017-2019



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfas's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Benefit from outstanding yield and feed value in this consistent FD3

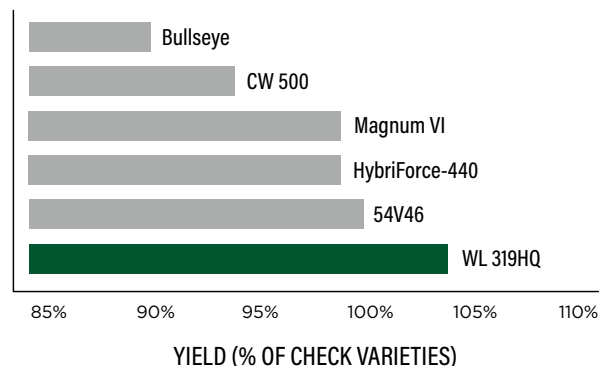
Proven in university and regional tests all across the country, WL 319HQ delivers exceptional yield potential and outstanding feed value. WL 319HQ also provides producers with the highest levels of cold tolerance and winterhardiness available in the W-L lineup today. Through NIR lab testing, WL 319HQ shows strong NDFD, RFQ and milk per acre to support dairy or beef nutrition programs.

### WL 319HQ Advantages

- Group 1.3 winterhardiness and Group 2.8 fall dormancy can deliver fast recovery after cutting, high yield potential, long stand life, and excellent cold tolerance
- A perfect disease resistance index (DRI) of 30/30 and strong resistance to insects and nematodes provide for big yield potential and long stand life across a wide range of soil types and climates
- Exceptional ration economics for both dairy and beef: high forage yield potential plus high feed quality can deliver significantly greater profit potential when fed
- WL 319HQ as an FD3 provides exceptional forage quality and digestibility
- Dark green, fine-stemmed, and highly digestible
- Fast recovery after cutting and outstanding winterhardiness allows intensive harvest management for maximum quality and yield potential with little to no sacrifices in stand life

### WL 319HQ Outyields the Competition in the West\*

WA, ID 2009-2011

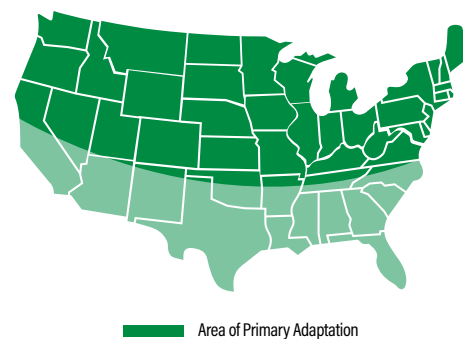




AGRONOMIC TRAITS		PEST RESISTANCE TRAITS	
Fall Dormancy	2.8	Bacterial Wilt	High Resistance
Winterhardiness	1.3	Fusarium Wilt	High Resistance
Maturity	Medium	Verticillium Wilt	High Resistance
Digestibility	Excellent	Anthracnose (Race 1)	High Resistance
Recovery After Harvest	Fast	Phytophthora Root Rot	High Resistance
Standability	Excellent	Aphanomyces Root Rot (Race 1)	High Resistance
Multileaf Expression	Very High	Leaf Disease	Resistance
Disease Resistance Index	30/30	Pea Aphid	Resistance
		Spotted Alfalfa Aphid	Resistance
		Stem Nematode	Moderate Resistance

## WL 319HQ Forage Quality Analysis\*

Variety	CP	%IVTD
<b>BOONE, IA 2001</b>		
WL 319HQ	23.4	79.4
Geneva	22.6	78.1
Magnum V	21.9	76.2
Pioneer® 53Q60	21.9	78.2
<b>LA CROSSE, WI 2001</b>		
WL 319HQ	22.3	77.1
Magnum V	20.6	75.1
Affinity +Z	21.8	75.2
Pioneer® 53Q60	21.0	74.9
<b>MOUNT JOY, PA 2001</b>		
WL 319HQ	25.2	82.6
Geneva	25.0	82.4
Magnum V	24.3	81.6
Pioneer® 54V54	24.0	81.0



\*Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Exceptional winterhardiness and outstanding profit potential

WL 3311HQ is building on WL 319HQ with the addition of the UltraCut™ alfalfa disease package.

### WL 3311HQ Advantages

- Highly resistant to multiple races of Aphanomyces for protection during establishment and early season cool and wet soil conditions
- Highly resistant to multiple races of Anthracnose for protection during warm and humid weather conditions
- Outstanding feed value with very high leaf to stem ratio
- Highest levels of cold tolerance and winterhardiness available in the W-L lineup today
- Disease resistance index (DRI) of 40/40 and strong resistance to aphids and nematodes provides solid yield potential and long stand life across a wide range of soil types and climates
- Dark green, fine-stemmed, and highly digestible
- Fast recovery after cutting and outstanding winterhardiness allows intensive harvest management for maximum quality and yield potential with little to no sacrifices in stand life
- Salt Tolerance at germination



2020 Wisconsin Variety Demo. Photo from September 8, 2022.



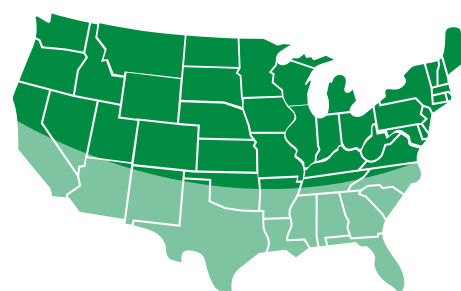
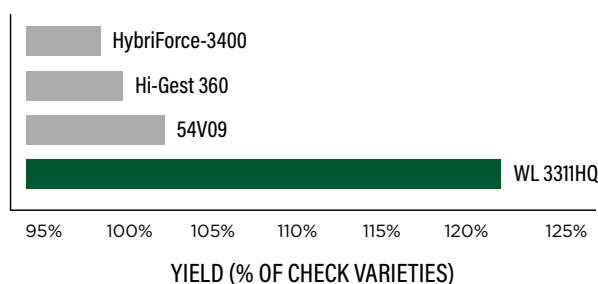
2022 Idaho Variety Demo. Photo from April 19, 2023.

AGRONOMIC TRAITS	
Fall Dormancy	3.4
Winterhardiness	1.0
Maturity	Medium
Digestibility	Excellent
Recovery After Harvest	Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	40/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	Resistance

## WL 3311HQ Outyields the Competition in the East\*

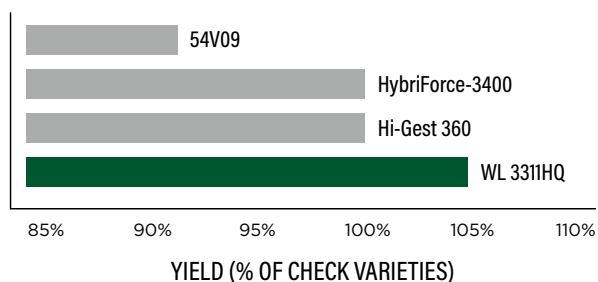
WI, PA 2018-2020



Area of Primary Adaptation

## WL 3311HQ Outyields the Competition in the West\*

WA, ID 2018-2020



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

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## HarvXtra® Alfalfa with Roundup Ready® Technology and an industry leading disease package, UltraCut™

HarvXtra® Alfalfa with Roundup Ready® Technology is truly a game changer in alfalfa production, and one of the most exciting breakthroughs to hit alfalfa and forage production ever.

### WL 3471.HVXRR Advantages

WL 3471.HVXRR gives growers tremendous value of flexibility in choosing to maximize exceptional fiber digestibility, or accumulate greater yield potential by delaying cutting frequency, without sacrificing feed quality. Lignin (ADL %, acid detergent lignin) content of at least 15% less than competitive check varieties on average gives WL 3471.HVXRR at least a 15% greater RFQ (relative forage quality) and NDFD (neutral detergent fiber digestibility).

- UltraCut™ Disease Package affecting establishment and in-crop performance, WL 3471.HVXRR's Disease Resistance Index (DRI) of 39/40 also includes HR (high resistance) to evolving Aphanomyces strains<sup>2</sup>, and resistance to Anthracnose race 5<sup>1</sup>
- Disease Resistance Index (39/40) and very winterhardy, (1.9), delivering long stand life under tough growing conditions
- WL 3471.HVXRR is stacked with Roundup Ready® Technology for exceptional broad spectrum weed control and crop safety to maximize seedling survival at establishment and provide a useful tool on established stands
- Well-adapted for Midwest, Northeast, Central and Northern Plains, as well as Intermountain Regions and Northwestern U.S.; ideally-suited for on-farm dairy, beef or cash hay producers
- Expect fast recovery for frequent harvest schedules under intense management

### UltraCut™ Disease Package

W-L Alfalfas with the UltraCut™ Disease Package can provide agronomic advantages by helping protect your crop against yield-limiting and evolving Anthracnose and Aphanomyces disease strains. You could see an increase in yield with each cutting when disease threatens your alfalfa and expand the acres you're able to plant. Help grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces threats with the UltraCut™ Disease Package.

### WL 3471.HVXRR Firmly Establishes a New Level of Fiber Digestibility and Feed Value in the West\*

#### ID, FIRST PRODUCTION YEAR

Variety	Yield	NDFD	RFQ	Milk lbs/Ac
<b>WL 3471.HVXRR</b>	<b>103%</b>	<b>109%</b>	<b>113%</b>	<b>112%</b>
54VR10	100%	99%	100%	101%
L-451APH2+	101%	101%	99%	100%
54HVX41	100%	109%	115%	107%

NDFD = Neutral Detergent Fiber Digestibility RFQ = Relative Forage Quality



AGRONOMIC TRAITS	
Fall Dormancy	4.3
Winterhardiness	1.9
Maturity	Early
Digestibility	HarvXtra*
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	39/40
Salt Tolerance	Germination

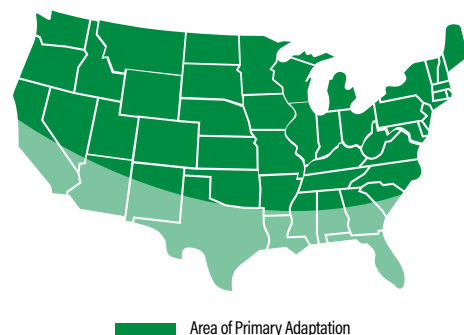
PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Stem Nematode	Resistance

## WL 3471.HVXRR Firmly Establishes a New Level of Fiber Digestibility and Feed Value in the East\*

### WI 2016-2021

Variety	Yield	NDFD	RFQ	Milk lbs/Ac
<b>WL 3471.HVXRR</b>	<b>106%</b>	<b>114%</b>	<b>115%</b>	<b>123%</b>
54HVX41	101%	113%	118%	117%
HybriForce-3400	93%	103%	107%	97%

NDFD = Neutral Detergent Fiber Digestibility RFQ = Relative Forage Quality



W-L Alfalfas and Forage Genetics International recommends the use of RFQ (relative forage quality) in place of RFV (relative feed value) because it more accurately reflects the value that improved fiber digestibility has in forages like HarvXtra® Alfalfa with Roundup Ready® Technology. RFQ better reflects performance that can be expected when animals are fed forages.

Likewise, RFQ is a far better index of forage quality than TDN (total digestible nutrients) because the TDN equation may not properly reflect fiber digestibility.

<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

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## Improved disease package and Roundup Ready® Fall Dormant 4

WL 3451HQ.RR is the latest W-L product with the UltraCut™ Disease Package that offers growers the ability to help protect yield and quality potential. WL 3451HQ.RR replaces WL 356HQ.RR and has HR levels for both evolving Aphanomyces strains<sup>2</sup> and Anthracnose Race 5. This creates better establishment success and in-season yield.

### WL 3451HQ.RR Advantages

- Highly resistant to multiple races of Aphanomyces for protection during establishment and early season cool and wet soil conditions
- Highly resistant to multiple races of Anthracnose for protection during warm and humid weather conditions
- Top choice for heavy, compacted and saturated soils
- Extremely winterhardy providing superb cold tolerance
- Salt Tolerance at germination
- High multifoliate expression for maximum quality
- The Roundup Ready® Alfalfa trait provides optimal weed control, making crop management easier than ever before — it helps produce better feed quality and stand during establishment while increasing yield potential
- Disease resistance index (DRI) of 40/40 for solid yield potential and stand persistence across a wide range of soil types and climates
- Quick regrowth after cutting with outstanding standability for intensive management systems
- Dark green, fine-stemmed and a highly palatable HQ variety
- Very well-adapted and selected for use in the Midwestern, Northwestern, Central Plains or Northeastern regions of the U.S.

### UltraCut™ Disease Package

W-L Alfalfas with the UltraCut™ Disease Package can provide agronomic advantages by helping protect your crop against yield-limiting and evolving Anthracnose and Aphanomyces disease strains. You could see an increase in yield with each cutting when disease threatens your alfalfa and expand the acres you're able to plant. Help grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces threats with the UltraCut™ Disease Package.



WL 3451HQ.RR

RR FD4 Comp

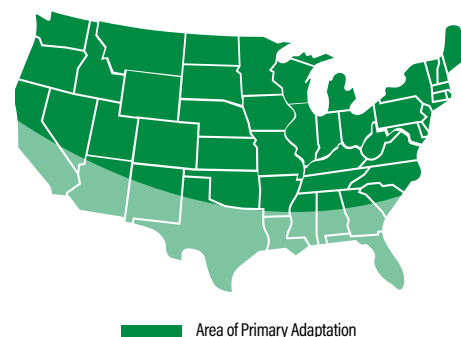
2020 Wisconsin Demo. Photo from May 6, 2022.

AGRONOMIC TRAITS	
Fall Dormancy	4.4
Winterhardiness	1.4
Maturity	Early
Digestibility	Excellent
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	40/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	Resistance

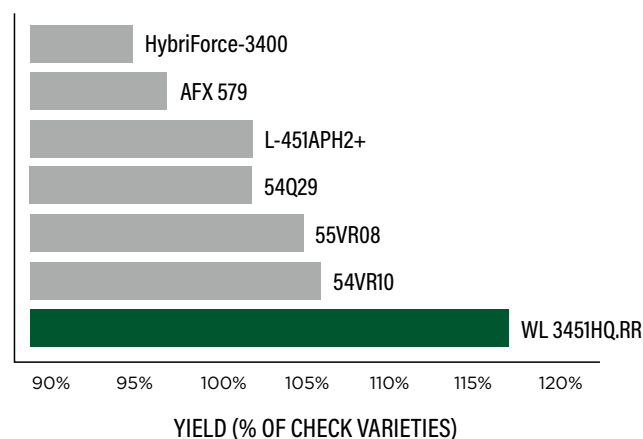
## Planting WL 3451HQ.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage, which can result in more milk per ton fed and higher RFQ
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased yield potential in both the establishment year and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



## WL 3451HQ.RR Outyields the Competition\*

WI, MN, PA 2019-2022



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas

## Improved disease package and Roundup Ready® Fall Dormant 4

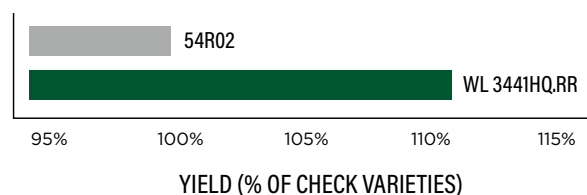
WL 3441.RR is a widely adapted Roundup Ready® variety containing high resistance to Stem Nematode and Aphanomyces and tolerance to salt.

### WL 3441HQ.RR Advantages

- Disease resistance package greatly effecting establishment and in-crop performance, WL 3441HQ.RR Disease Resistance Index (DRI) of 35/35 also includes resistance to evolving Aphanomyces strains<sup>2</sup>
- Very winterhardy (WH=2.0); WL 3441HQ.RR delivers long stand life under adverse weather and soil conditions
- Highly resistant (HR) to stem nematode
- Ideal FD4 variety for Midwest, Northern Plains, Pacific Northwest and Northeastern region of the U.S. for hay and haylage uses
- Salt tolerance of germinating seeds similar to resistant check

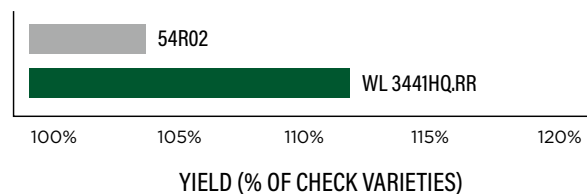
### WL 3441HQ.RR Outyields the Competition in the East\*

MN, WI, PA 2014-2016



### WL 3441HQ.RR Outyields the Competition in the West\*

WA, ID 2014-2016



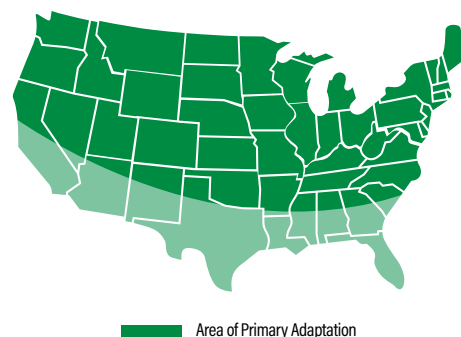


AGRONOMIC TRAITS	
Fall Dormancy	4.3
Winterhardiness	2.0
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	35/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	High Resistance

## Planting WL 3441HQ.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage, which can result in more milk per ton fed and higher RFQ
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased yield potential in both the establishment year and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



<sup>1</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfa's location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfa's.

## Roundup Ready® Fall Dormant 4 branded alfalfa with improved disease and pest resistance

WL 3440.RR Brand, a new FD4 branded Roundup Ready® variety with an improvement over Powerstand® RR Brand, boasts resistance to aphanomyces root rot race 2, stem nematode and pea aphid.

### WL 3440.RR Brand Advantages

- Combines a fall dormancy rating of 4.0 with a winter-hardiness score of 2.0 for optimum persistence and high yield potential
- Highly resistant to all six major alfalfa diseases—Phytophthora Root Rot, Bacterial Wilt, Fusarium Wilt, Anthracnose (Race 1), Aphanomyces (Race 1), and Verticillium Wilt
- Good stress tolerance for dryland, irrigated and saturated soils under intense management situations
- Forage quality is above average with a high leaf-to-stem ratio

### Planting WL 3440.RR Brand alfalfa and using the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

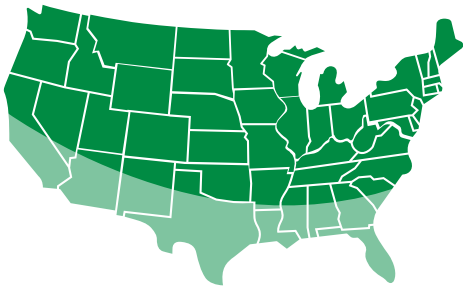
- Weed control at both stand establishment and in established stands means fewer weeds and higher quality hay and haylage, which can result in more milk and beef per acre
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased yield potential in both the establishment year and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding





AGRONOMIC TRAITS	
Fall Dormancy	4.0
Winterhardiness	2.0
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Fast
Standability	Excellent
Multileaf Expression	High
Disease Resistance Index	34/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthraxnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	Resistance
Pea Aphid	Resistance
Stem Nematode	Resistance



Area of Primary Adaptation



## Exceptional quality for an exceptional value

### PowerStand® RR Brand Delivers Outstanding Performance

- An economical Roundup Ready® alfalfa blended for dependable forage yield potential and good quality
- Good winterhardiness and pest package with resistance to key diseases
- Moderate to fast recovery after cutting for optimum yield potential

### Planting PowerStand® RR Brand alfalfa and utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Weed control at both stand establishment and in established stands means fewer weeds and higher quality hay and haylage, which can result in more milk and beef per acre
- Optimal crop safety at all growth stages provides increased yield potential in both the establishment and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank-mix; one herbicide does it all
- Flexibility in timing of application allows growers to spray when necessary; minimal carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding

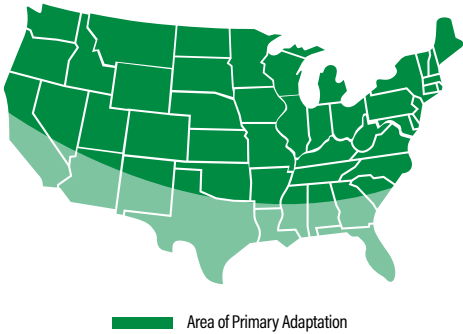






AGRONOMIC TRAITS	
Fall Dormancy	4.0
Winterhardiness	2.0
Recovery After Harvest	Moderate to Fast
Standability	Excellent
Multileaf Expression	High
Disease Resistance Index	28/30

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	Resistance



## Achieve greater yield potential and outstanding forage quality under heavy leafhopper pressure

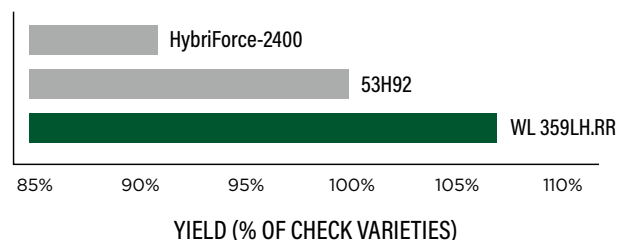
WL 359LH.RR is our third release in the category of stacked glyphosate tolerance and potato leafhopper resistance. Bred and selected for the Midwest and Northeastern U.S. growers, WL 359LH.RR is an exciting new product, now with the industry's leading eighth-generation PLH resistance package. The HopperShield™ lineup, and now WL 359LH.RR, is an ideal pick for dairy, beef or cash hay growers looking for top yield potential and quality under various levels of leafhopper pressure.

### WL 359LH.RR Advantages

- Eighth-generation potato leafhopper resistance with HopperShield™ protection delivers high yield potential and forage quality without the need to spray, even under heavy leafhopper pressure
- Impressive stand health visuals under various levels of leafhopper pressure, coupled with ability to apply broad-spectrum weed control and crop safety of glyphosate
- Winterhardy (WH=2.2); WL 359LH.RR delivers solid winter survival, even under harsh winter conditions
- Disease resistance index (DRI) of 34/35 for solid yield potential and stand persistence across a wide range of soil types and climates
- Dark green, fine-stemmed and a highly palatable HopperShield™ product
- Under various management and cutting schedules, WL 359LH.RR helps ensure solid yield potential, quality and persistence against yield-robbing PLH pests
- Well-adapted and bred for use in the Midwestern or Northeastern U.S. for hay or haylage use

### WL 359LH.RR Outyields the Competition\*

IA 2012-2013



### Planting WL 359LH.RR alfalfa and using the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Superb weed control at both stand establishment and in established stands means fewer weeds and higher quality hay and haylage, which can result in more milk and beef per acre
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased yield potential in both the establishment year and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



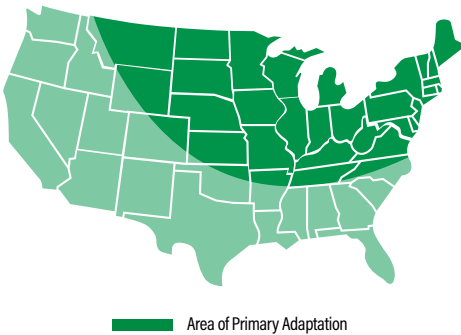
AGRONOMIC TRAITS	
Fall Dormancy	3.9
Winterhardiness	2.2
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	High
Disease Resistance Index	34/35

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	Resistance
Potato Leafhopper	High Resistance

Treatment Thresholds for Potato Leafhoppers\*

IOWA STATE UNIVERSITY		
Alfalfa Stem	Conventional Varieties	WL 359LH.RR
4 inches	4	41
6 inches	6	62
8 inches	8	82
10 inches	10	103
LEAFHOPPERS PER 10 SWEEPS		

When compared to conventional alfalfas, WL 359LH.RR can tolerate over TEN times the level of potato leafhoppers before spray treatment is necessary.



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## UltraCut™ Disease Package raises ante on alfalfa yield potential and persistence leaders

Broad disease resistance is always a priority on our research teams, constantly looking for additional tolerance across a wide geography. WL 349HQ is a breakthrough W-L product, with an evolving Aphanomyces strains<sup>2</sup> and Anthracnose<sup>1</sup> UltraCut™ Disease Package that offers growers the ability to help protect yield and quality potential. If top tier yield potential, quality and persistence under tough soil conditions at establishment or in-crop are your must-haves, you've found your next conventional variety.

### WL 349HQ Advantages

- A new day in disease resistance greatly affecting establishment and in-crop performance, WL 349HQ's perfect Disease Resistance Index (DRI) of 40/40 also includes HR (high resistance) to evolving Aphanomyces strains<sup>2</sup>, and HR to Anthracnose race 1 and race 5<sup>1</sup>
- Superb winterhardiness (WH=1.7); WL 349HQ delivers excellent cold tolerance and persistence
- WL 349HQ contains "HQ" high-quality feed value levels highly desirable for dairy and cash hay producers
- UltraCut™ Disease Package offers expanding yield advantages over competitive checks with added years in production
- WL 349HQ delivers fast recovery in an FD4 package
- Great standability for intensive management systems
- Dark green, fine-stemmed, and a highly palatable HQ variety
- Very well-adapted and selected for use in the Midwest, Northeast, Intermountain regions, Pacific Northwest or Central and Northern Plains of the U.S.

### UltraCut™ Disease Package

W-L Alfalfas with the UltraCut™ Disease Package can provide agronomic advantages by helping protect your crop against yield-limiting and evolving Anthracnose and Aphanomyces disease strains. You could see an increase in yield with each cutting when disease threatens your alfalfa and expand the acres you're able to plant. Help grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces threats with the UltraCut™ Disease Package.

### Example of high-resistance Multi-Race Aphanomyces and Anthracnose resistance varieties (in the middle) compared to susceptible competitive check varieties (on outsides)



Photo from FGI Research Facility; West Salem, WI; June 2018

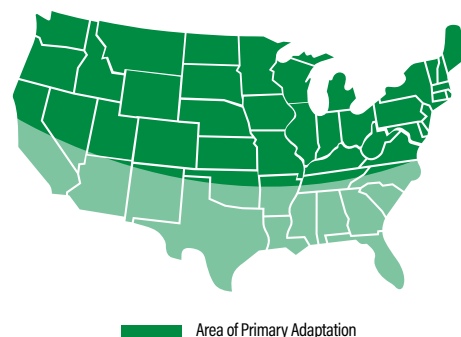
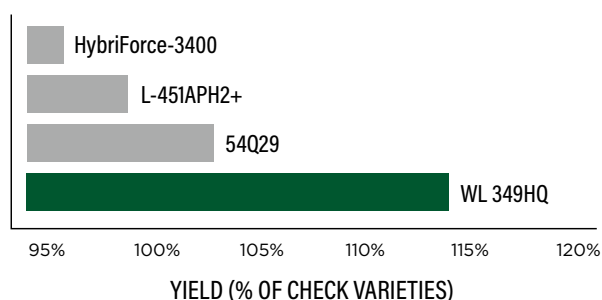


AGRONOMIC TRAITS	
Fall Dormancy	4.4
Winterhardiness	1.7
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	40/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	High Resistance
Stem Nematode	Resistance

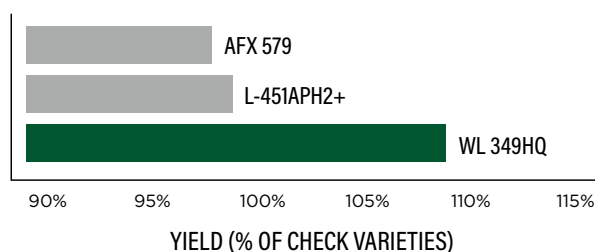
## WL 349HQ Outyielded Three Leading Competitors in the Midwest and East\*

WI, IA, PA, NY 2019-2022



## WL 349HQ Outyielded Two Leading Competitors in the West\*

WA, ID, KS 2019-2022



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfa's location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfa's.



## The next level of enhanced potato leafhopper resistance

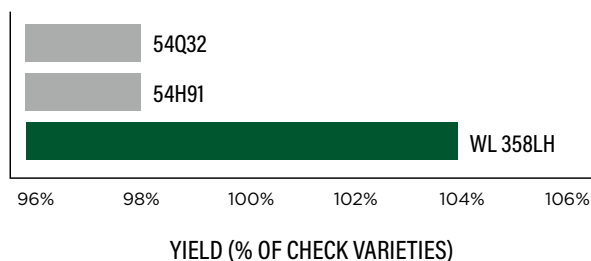
Geared and selected for Midwest and Northeastern U.S. growers, WL 358LH is the latest in the line of varieties selected for some of the highest potato leafhopper resistance available, now an industry leading eighth-generation. Combined with an improved yield and quality package, WL 358LH is an ideal pick for dairy, beef or cash hay growers looking to maximize production under various levels of leafhopper pressure.

### WL 358LH Advantages

- Superb yield potential and agronomic performance under 3- to 5-cut harvest management systems, with or without leafhopper pressure
- Visually impressive variety under moderate or heavy PLH pressure
- Winterhardy (WH=2.0); WL 358LH delivers optimal cold tolerance, even under harsh weather conditions
- Disease resistance index (DRI) of 34/35 for solid yield potential and long stand life across a wide range of soil types and climates
- Dark green, fine-stemmed and a highly digestible HopperShield™ variety
- Regardless of management style or cutting schedule, WL 358LH delivers peace-of-mind on yield potential, quality and persistence-robbing PLH pests
- Very well-adapted and selected for use in the Midwestern or Northeastern U.S. for hay or haylage use

### WL 358LH Outyielded Two Leading Competitors in IA and PA\*

IA, PA 2011-2012

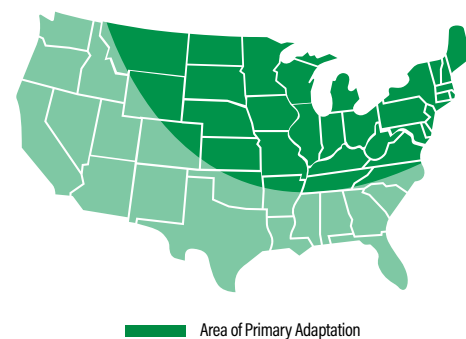


AGRONOMIC TRAITS		PEST RESISTANCE TRAITS	
Fall Dormancy	4.1	Bacterial Wilt	High Resistance
Winterhardiness	2.0	Fusarium Wilt	High Resistance
Maturity	Early	Verticillium Wilt	High Resistance
Digestibility	Superior	Anthracnose (Race 1)	High Resistance
Recovery After Harvest	Very Fast	Phytophthora Root Rot	High Resistance
Standability	Excellent	Aphanomyces Root Rot (Race 1)	High Resistance
Multileaf Expression	Very High	Aphanomyces Root Rot (Race 2)	Resistance
Disease Resistance Index	34/35	Pea Aphid	High Resistance
		Stem Nematode	Resistance
		Potato Leafhopper	High Resistance

## Treatment Thresholds for Potato Leafhoppers\*

IOWA STATE UNIVERSITY		
Alfalfa Stem	Non-PLH Varieties	WL 358LH
4 inches	4	41
6 inches	6	62
8 inches	8	82
10 inches	10	103
LEAFHOPPERS PER 10 SWEEPS		

When compared to conventional alfalfas, WL 358LH can tolerate over TEN times the level of potato leafhoppers before spray treatment is necessary.



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## W-L alfalfas bulks up HarvXtra® Alfalfa lineup with F5 addition

Our first fall dormancy 5 HarvXtra® Alfalfa release, WL 375HVX.RR, simply delivers. WL 375HVX.RR complements the 2021 release of WL 3471.HVXRR, offering another valuable winterhardy option with UltraCut™ alfalfa disease resistance package and the HarvXtra® Alfalfa trait.

### WL 375HVX.RR Advantages

- WL 375HVX.RR offers tremendous value of flexibility in choosing to maximize fiber digestibility, or realize greater yield by delaying cutting frequency, perhaps removing 1 cut, without sacrificing feed quality
- Reduced-lignin % (ADL, acid detergent lignin) content of 22% less than the average of competitive check varieties gives
- Exceptional yield performance across 4 of our major U.S. research facilities
- Features UltraCut™ Disease Package, a Disease Resistance Index (39/40), which includes 'High Resistance' to evolving Aphanomyces strains<sup>2</sup>; and includes multi-race resistance to Anthracnose<sup>1</sup>
- WL 375HVX.RR contains Roundup Ready® Technology for unsurpassed broad spectrum weed control and crop safety to maximize seedling survival at establishment and provide a useful tool on established stands
- Well-adapted for Midwest, Northeast, Central, Northern, & Southern Plains, as well as Intermountain Regions and Pacific Northwest; ideally-suited for on-farm dairy, beef or cash hay producers
- WL 375HVX.RR delivers quick recovery for frequent harvest schedules under intense management
- Quick stand establishment with WL 375HVX.RR that comes fully loaded with W-L's Gold Treatment PLUS containing Stamina® seed treatment

### UltraCut™ Disease Package

W-L Alfalfas with the UltraCut™ Disease Package can provide agronomic advantages by helping protect your crop against yield-limiting and evolving Anthracnose and Aphanomyces disease strains. You could see an increase in yield with each cutting when disease threatens your alfalfa and expand the acres you're able to plant. Help grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces threats with the UltraCut™ Disease Package.

**Planting WL 375HVX.RR with high resistance to multiple races of aphanomyces and anthracnose significantly improves stand establishment and production.**



**Competitor** (Susceptible)

**WL 375HVX.RR** (High Resistance)

AGRONOMIC TRAITS	
Fall Dormancy	4.6
Winterhardiness	2.1
Maturity	Early
Digestibility	HarvXtra*
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	39/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	High Resistance

## WL 375HVX.RR Outyields the Competition in the East\*

MN, WI, PA 2018-2019

Variety	Yield	NDFD	RFQ	Milk lbs/Ac
<b>WL 375HVX.RR</b>	<b>108%</b>	<b>114%</b>	<b>111%</b>	<b>124%</b>
54HVX41	101%	114%	115%	113%
54QR04	101%	100%	100%	98%

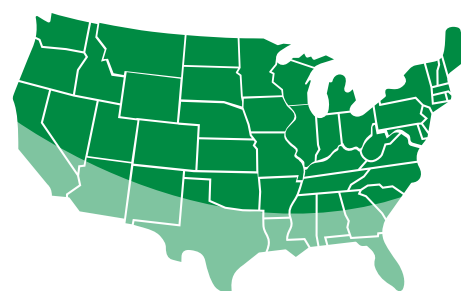
NDFD = Neutral Detergent Fiber Digestibility RFQ = Relative Forage Quality

## WL 375HVX.RR Firmly Establishes a New Level of Fiber Digestibility and Feed Value in the West\*

WA 2019-2021

Variety	Yield	NDFD	RFQ	Milk lbs/Ac
<b>WL 375HVX.RR</b>	<b>102%</b>	<b>108%</b>	<b>107%</b>	<b>108%</b>
54VR10	101%	96%	93%	98%
54HVX42	101%	103%	109%	105%
55VR08	101%	102%	94%	100%
54HVX41	101%	108%	104%	106%
L-451APH2+	97%	99%	102%	98%
AFX 579	93%	101%	99%	93%

NDFD = Neutral Detergent Fiber Digestibility RFQ = Relative Forage Quality



Area of Primary Adaptation

W-L Alfalfas and Forage Genetics International recommends the use of RFQ (relative forage quality) in place of RFV (relative feed value) because it more accurately reflects the value that improved fiber digestibility has in forages like HarvXtra® Alfalfa with Roundup Ready® Technology. RFQ better reflects performance that can be expected when animals are fed forages.

Likewise, RFQ is a far better index of forage quality than TDN (total digestible nutrients) because the TDN equation may not properly reflect fiber digestibility.

<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## Exceptional tonnage and forage quality under intensive management

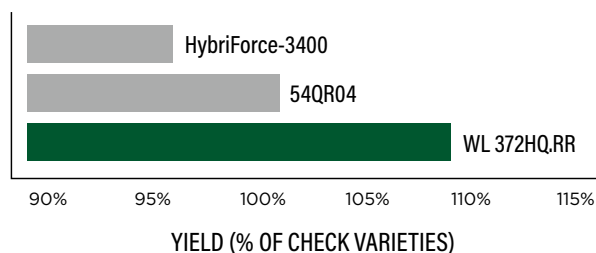
The combination of exceptional yield potential, very broad adaptation, and "HQ" superior feed value make WL 372HQ.RR the variety of choice for cash hay and dairy producers looking for an FD5 alfalfa that maximizes profit potential under intensive management while utilizing the breakthrough benefits of the Roundup Ready® weed control system in alfalfa.

### WL 372HQ.RR Advantages

- WL 372HQ.RR demonstrates "HQ" forage quality levels that promote optimized feed intake, milk production, and profit potential when fed
- Very winterhardy (WH=1.8); WL 372HQ.RR delivers long stand life even under harsh weather conditions
- Very strong disease package with a Disease Resistance Index (DRI) of 34/35 to promote fast establishment
- High resistance (HR) to stem nematode
- Ideal FD5 variety for cash hay growers, dairy producers, or other intensive managers; WL 372HQ.RR has produced high yield potential of leafy, fine-stemmed hay with high RFQ levels establishment and long stand life
- Ideal FD5 variety for Midwest, Northern Plains, Pacific Northwest and Northeastern region of the U.S. for hay and haylage uses
- Salt tolerance of germinating seeds similar to resistant check

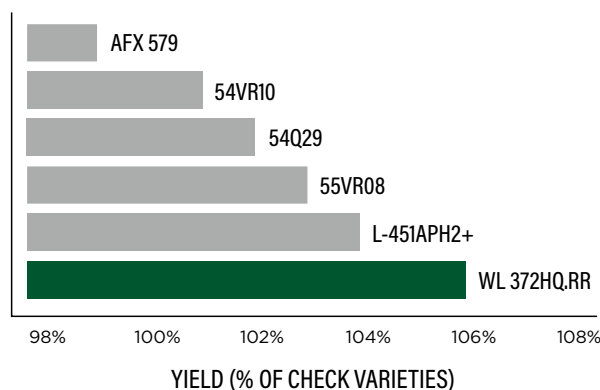
### WL 372HQ.RR Outyields the Competition in the East\*

WI, IA, PA 2016-2021



### WL 372HQ.RR Outyields the Competition in the West\*

KS 2019-2022

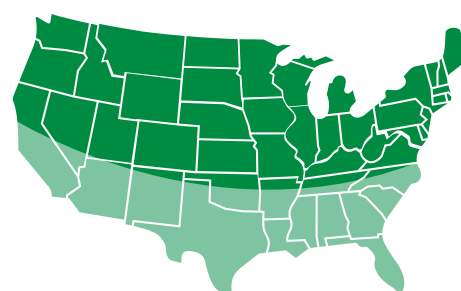


AGRONOMIC TRAITS	
Fall Dormancy	4.9
Winterhardiness	1.8
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	34/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance

### Planting WL 372HQ.RR alfalfa and utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher quality hay and haylage, which can result in more milk per ton fed and higher RFQ when tested
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased yield potential in both the establishment year and subsequent years
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix; one herbicide does it all
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



Area of Primary Adaptation

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Exceptional tonnage and forage quality under intensive management

The combination of exceptional yield potential, very broad adaptation, and HQ superior feed value make WL 3546HQ.RR the variety of choice for cash hay and dairy producers looking for an FD5 alfalfa that maximizes profit potential under intensive management while utilizing the breakthrough benefits of the Roundup Ready® weed control system in alfalfa.

### WL 3546HQ.RR Advantages

- Our highest-yielding winterhardy RR FD5 released to date
- Highly resistant to multiple races of Aphanomyces for protection during establishment and early season cool and wet soil conditions
- Highly resistant to multiple races of Anthracnose for protection during warm and humid weather conditions
- Top choice for heavy, compacted and saturated soils
- Salt Tolerance at germination
- High multifoliate expression for maximum quality
- The Roundup Ready® Alfalfa trait provides optimal weed control, making crop management easier than ever before — it helps produce better feed quality and stand during establishment while increasing yield potential
- Disease resistance index (DRI) of 40/40 for solid yield potential and stand persistence across a wide range of soil types and climates
- Quick regrowth after cutting with outstanding standability for intensive management systems
- WL 3546HQ.RR demonstrates HQ forage quality levels that promote optimized feed intake, milk production, and profit potential
- Very winterhardy (WH=1.4); WL 3546HQ.RR delivers long stand life even under harsh weather conditions
- Resistant to aphids and nematodes
- Ideal FD5 variety for cash hay growers, dairy producers, or other intensive managers; WL 3546HQ.RR has produced high yield potential of leafy, fine-stemmed hay with high RFQ levels establishment and long stand life



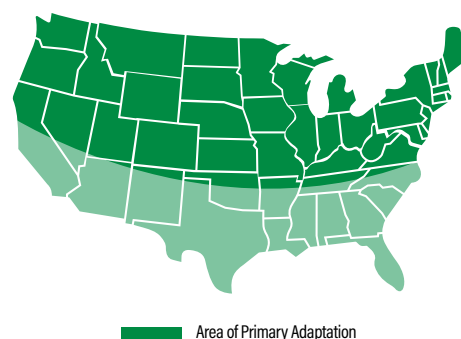
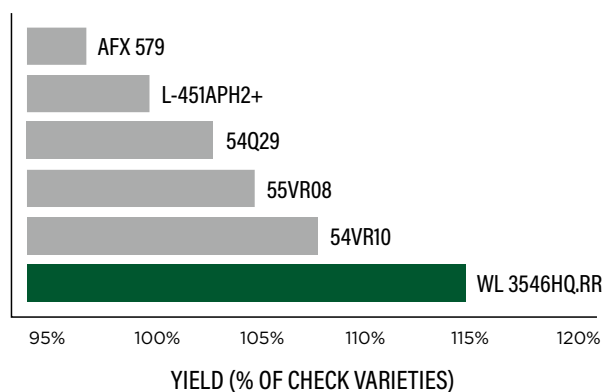
2022 Idaho Spring Demo. Photo from September 22, 2022.

AGRONOMIC TRAITS	
Fall Dormancy	5.0
Winterhardiness	1.4
Maturity	Early
Digestibility	Excellent
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	40/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	Resistance

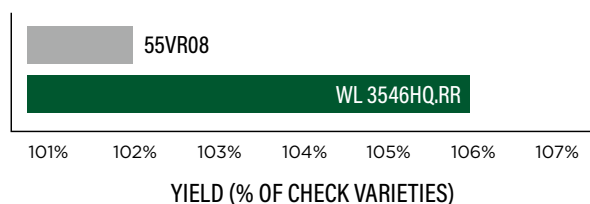
## WL 3546HQ.RR Outyields the Competition in the East\*

WI, PA 2019-2022



## WL 3546HQ.RR Outyields the Competition in the West\*

ID, KS 2020-2022



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.



## A winterhardy FD5 and WH1 high-yield leader

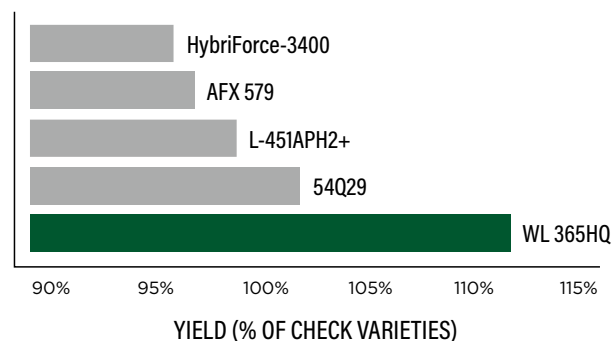
In 2002, W-L Alfalfas released its first 5/1 variety, which was an industry breakthrough, decoupling fall dormancy and winterhardiness, allowing growers across the U.S. to realize greater yield potential during the growing season without sacrificing winterhardiness or stand persistence.

### WL 365HQ Advantages

- HQ forage-quality levels make an ideal variety for cash hay or dairy producers
- Extremely winterhardy (WH=1.1); WL 365HQ delivers outstanding cold tolerance and long stand life, even under harsh weather conditions
- Disease resistance index (DRI) of 34/35 for solid yield potential and stand persistence across a wide range of soil types and climates
- Quick regrowth after cutting with outstanding standability for intensive management systems
- Dark green, fine-stemmed and a highly palatable HQ variety
- WL 365HQ delivers fast recovery, quickly closing the canopy to outpace yield-robbing weeds
- Very well-adapted and selected for use in the Midwestern, Northwestern, Central Plains or Northeastern regions of the U.S.

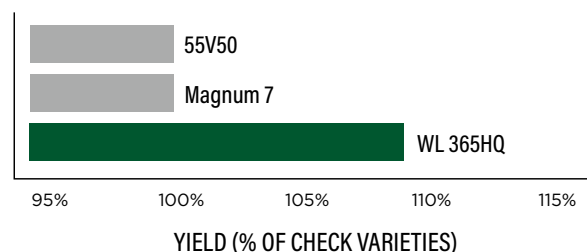
### WL 365HQ Outyields the Competition in the East\*

WI, IA, PA, NY 2019-2022



### WL 365HQ Outyields the Competition in the West\*

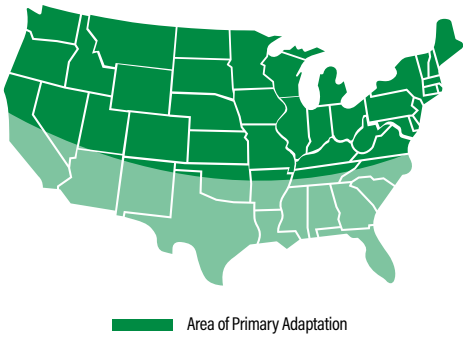
WA, ID 2017-2019





AGRONOMIC TRAITS	
Fall Dormancy	4.9
Winterhardiness	1.1
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	34/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	Resistance



\* Results are based on controlled field trials at the listed W-L Alfalfa location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfa.

## UltraCut™ Disease Package raises ante on alfalfa yield potential and persistence leaders

Broad disease resistance is always a priority on our research teams, constantly looking for additional tolerance across a wide geography. WL 3521HQ is a new breakthrough product, with the UltraCut™ Disease Package that offers growers the ability to help protect yield and quality potential. If top tier yield potential, quality and persistence under tough soil conditions at establishment or in-crop are your must-haves, you've found your next conventional variety.

### WL 3521HQ Advantages

- A new day in disease resistance greatly affecting establishment and in-crop performance, WL 3521HQ's perfect Disease Resistance Index (DRI) of 40/40 also includes HR (high resistance) to evolving aphanomyces strains<sup>2</sup>, and HR to anthracnose race 1 and race 5<sup>1</sup>
- Superb winterhardiness (WH=1.8); WL 3521HQ delivers excellent cold tolerance and persistence
- WL 3521HQ contains high-quality feed value levels highly desirable for dairy and cash hay producers
- UltraCut™ Disease Package offers expanding yield advantages over competitive checks with added years in production
- WL 3521HQ delivers fast recovery in an FD5 package
- Great standability for intensive management systems
- Dark green, fine-stemmed, and a highly palatable HQ variety
- Very well-adapted and selected for use in the Midwest, Northeast, Intermountain regions, Pacific Northwest or Central and Northern Plains of the U.S.

### UltraCut™ Disease Package

W-L Alfalfas with the UltraCut™ Disease Package can provide agronomic advantages by helping protect your crop against yield-limiting and evolving Anthracnose and Aphanomyces disease strains. You could see an increase in yield with each cutting when disease threatens your alfalfa and expand the acres you're able to plant. Help grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces threats with the UltraCut™ Disease Package.

**High-resistance Multi-Race Aphanomyces and Anthracnose resistance varieties (in the middle) compared to susceptible competitive check varieties (on outsides)**



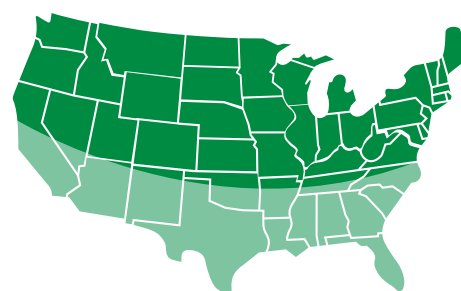
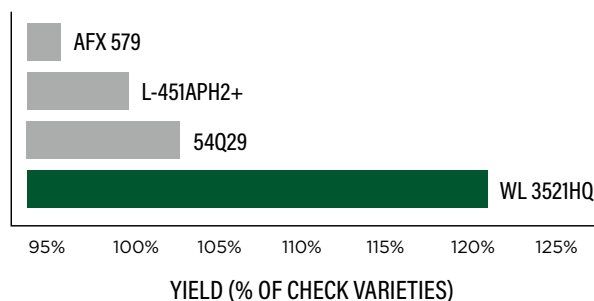
Photo from FGI Research Facility; West Salem, WI; June 2018

AGRONOMIC TRAITS	
Fall Dormancy	5.0
Winterhardiness	1.8
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	40/40
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Anthracnose (Race 5) <sup>1</sup>	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Aphanomyces Root Rot (Race 2)	High Resistance
Evolving Aphanomyces Strains <sup>2</sup>	High Resistance
Pea Aphid	Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	Resistance

## WL 3521HQ Outyields the Competition in the East\*

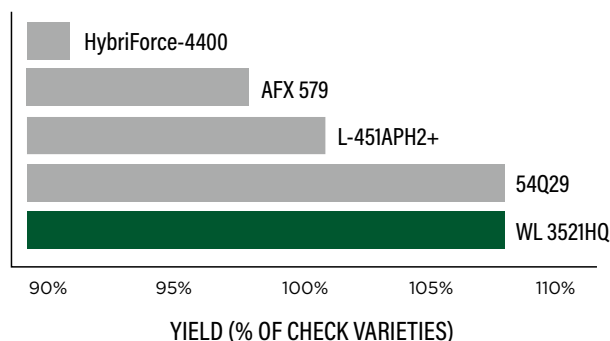
WI, PA 2019-2022



Area of Primary Adaptation

## WL 3521HQ Outyields the Competition in the West\*

ID 2022, FIRST PRODUCTION YEAR



<sup>1</sup> Includes Race 1 protection, along with Anthracnose Race 5 protection, which is patented by FGI.

<sup>2</sup> Includes Race 1 and Race 2 protection. In addition, Forage Genetics International, LLC (FGI) has identified a novel source of Aphanomyces resistance in the greenhouse and field that visibly outperforms unrelated varieties on the market when grown under natural or artificial disease pressure. FGI researchers have been working cooperatively with universities collecting and testing the most virulent strains of Aphanomyces to help determine the level of resistance to this novel source.

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## Top of our FD5 class in the West

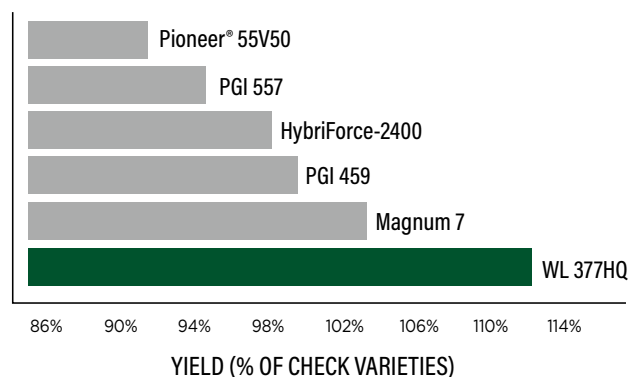
There have been many breakthrough varieties since the inception of W-L Alfalfas and WL 377HQ is one of those varieties. Simply put, if exceptional yield potential, 'HQ' levels of feed value, and high resistance to all major nematodes and aphids are high on your wish list, then WL 377HQ is your kind of product.

### WL 377HQ Advantages

- Solid winterhardiness (WH=2.5); WL 377HQ delivers excellent cold tolerance and persistence
- "HQ" feed value levels make WL 377HQ highly desirable for cash hay and dairy producers alike
- Highly-resistant to all major nematodes and aphids
- WL 377HQ delivers fast recovery, quickly closing the canopy to outpace yield-robbing weeds
- Disease resistance index (DRI) of 30/30 for solid yield potential and stand persistence across a wide range of soil types and climates
- Great standability for intensive management systems
- Dark green, fine-stemmed, and a highly palatable HQ variety
- Very well-adapted and selected for use in the Pacific Northwest, Intermountain regions or Central and Southern Plains of the U.S.

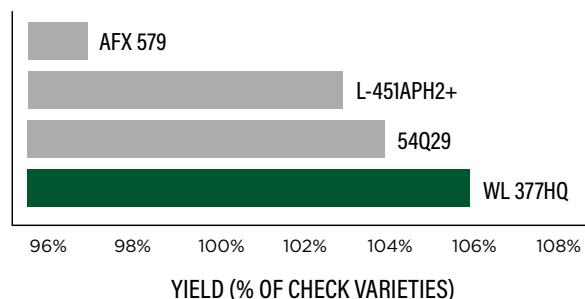
### WL 377HQ Outyields the Competition in the West\*

#### NAMPA, ID 2013-2015



### WL 377HQ Outyields the Competition in the West\*

#### ID, KS 2019-2022





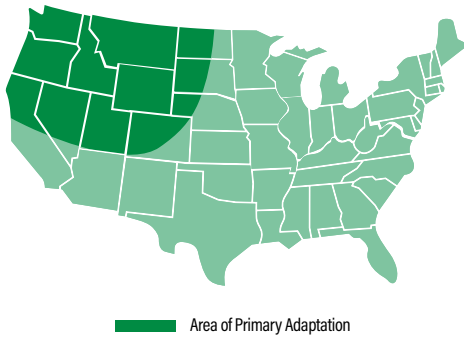
AGRONOMIC TRAITS	
Fall Dormancy	5.0
Winterhardiness	2.5
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Very High
Disease Resistance Index	30/30
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance
Root-Knot Nematode (Northern)	High Resistance

### WL 377HQ Forage Quality Analysis\*

NAMPA, ID 2014			
Variety	CP	NDFD	RFQ
WL 377HQ	21.2	44.4	174
WL 363Q	21.5	44.2	170
HybriForce-2400	21.3	44.2	166
Pioneer® 55Q27	21.2	43.7	166
Pioneer® 54Q25	20.7	43.9	160

CP= Crude Protein    NDFD = Neutral Detergent Fiber Digestibility    RFQ = Relative Forage Quality



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfas's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## The first FD6 release of a HarvXtra® alfalfa product

HarvXtra® Alfalfa is the industry's first genetically enhanced alfalfa technology developed to maximize quality compared to conventional alfalfa at the same stage of maturity, by reducing the amount of lignin in the plant.

### HVX3686RR Brand Advantages

- HarvXtra Alfalfa gives growers the ability to better manage the yield-versus-quality trade-off. It offers more flexibility in cutting schedule to achieve improved forage quality or greater yield potential, when compared to conventional alfalfa at the same stage of maturity
- The HarvXtra technology provides unprecedented flexibility by widening cutting windows, which gives growers the option at each cutting to:
  1. Maintain their normal harvest schedules for higher-quality forage, **or**
  2. Delay harvest for 5-7 days for increased yield potential, without sacrificing forage quality, compared to conventional alfalfa at the same stage of maturity
- HarvXtra Alfalfa has 10-15% higher neutral detergent fiber digestibility (NDFd) than conventional alfalfa harvested at the same stage of maturity
- HarvXtra Alfalfa is stacked with the Roundup Ready® Technology for unsurpassed weed control with excellent crop safety

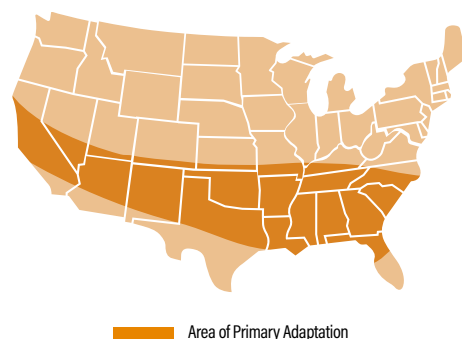
### Planting HVX3686RR Brand utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliate stage to provide early weed control on new seedlings and lower seedling mortality
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



AGRONOMIC TRAITS	
Fall Dormancy	6.0
Winter Activity	Moderate
Digestibility	HarvXtra®
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent

PEST RESISTANCE TRAITS	
Bacterial Wilt	Moderate Resistance
Fusarium Wilt	High Resistance
Anthracnose (Race 1)	Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	Resistance
Blue Alfalfa Aphid	Moderate Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	Resistance



## HVX3686RR Brand Variety Performance

Canyon, TX; Davis, CA; Los Banos, CA 2016-2019

Variety	FD	Forage Yield (% Commercial Checks)			Forage Quality (NDFD % Commercial Checks)		
		Canyon, TX	Davis, CA	Los Banos, CA	Canyon, TX	Davis, CA	Los Banos, CA
<b>HVX3686RR Brand</b>	<b>6</b>	<b>97</b>	<b>104</b>	<b>99</b>	<b>115</b>	<b>110</b>	<b>112</b>
RR Six Shooter	6	99	-	-	100	-	-
RRALF 6R200	6	-	105	96	-	101	101
WL 454HQ.RR	6	105	98	102	95	101	101
AmeriStand 715NT RR	7.4	-	-	98	-	-	101

FD = Fall Dormancy

Note: Data come from FGI trials comparing HarvXtra® Alfalfa with Roundup Ready® Technology to commercial checks.

Seeded Fall of 2015 in Davis, Los Banos, Canyon. Data collected 2016-2019 in Davis and Los Banos, 2016-2017 in Canyon in 2015 trials.

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## Salt tolerant variety with exceptional yield potential and outstanding hay quality

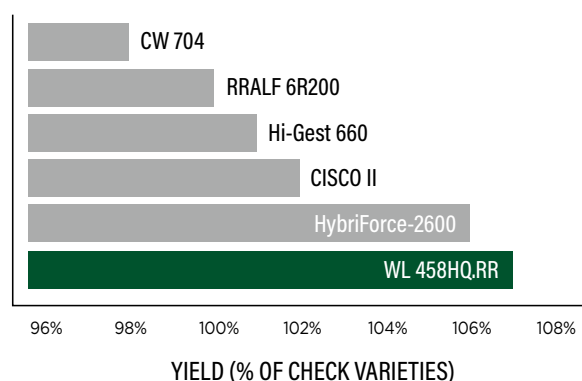
### WL 458HQ.RR Advantages

- Semi-dormant FD=6
- Exceptional salt tolerance derived from our salt breeding program
- Resistant to all major aphid and nematode pests
- Supports optimized feed intake, milk production, and greater profit potential
- Ideal semi-dormant variety for the cash hay producer: WL 458HQ.RR has consistently produced big yields of leafy, fine-stemmed hay with dark green color and high feed value
- Very strong disease resistance package (including HR to Phytophthora Root Rot, Fusarium Wilt, Verticillium Wilt and Anthracnose) promotes fast seedling establishment and long stand life



### WL458HQ.RR Outyields the Competition\*

KS 2020-2022



### WL 458HQ.RR Delivers More Tons of Weed-Free Hay

Outstanding yield potential and superior feed value make WL 458HQ.RR the variety of choice for cash hay and dairy producers looking for a FD6 alfalfa that maximizes production and profit potential in their operations while utilizing the breakthrough benefits of the Roundup Ready® weed control system.

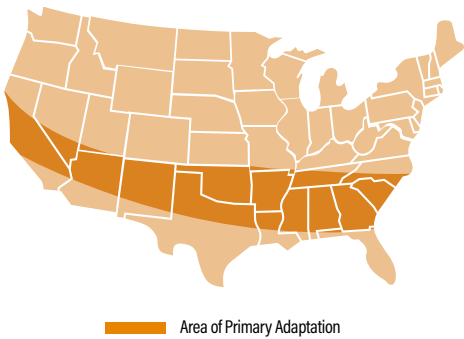


AGRONOMIC TRAITS	
Fall Dormancy	6.0
Winter Activity	Moderate
Digestibility	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Multileaf Expression	Moderate
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces Root Rot (Race 1)	High Resistance
Blue Alfalfa Aphid	Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	High Resistance

**Planting WL 458HQ.RR Alfalfa and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs**

- Exceptional weed control both when establishing new stands and in established stands means fewer weeds and higher quality hay, which can result in higher forage quality and greater profit potential
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system can deliver thicker stands and higher yield potential for the life of stand
- Flexibility in timing of herbicide application allows alfalfa producers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## Consistent high performer in semi-dormant territory

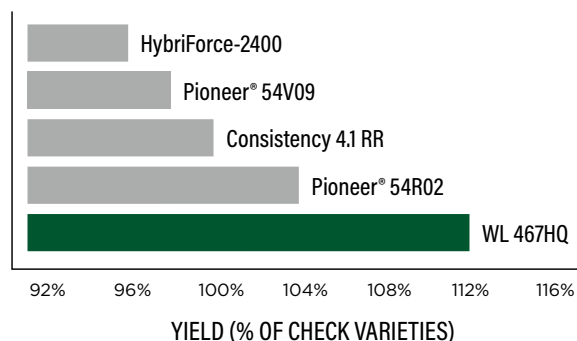
WL 467HQ complements and continues the gains made in the semi-dormant space for W-L Alfalfas. Not only is WL 467HQ a go-to selection for yield and 'HQ' levels of feed value, it contains an agronomic package of high resistance levels to yield-robbing stem nematode and pea aphid among others, making it a wise long-term investment.

### WL 467HQ Advantages

- "HQ" feed value levels make WL 467HQ highly desirable for cash hay and dairy producers alike
- Highly-resistant to stem and root knot nematode, and pea aphid to allow to maximize genetic potential
- WL 467HQ delivers fast recovery, quickly closing the canopy to outpace yield-robbing weeds
- Very strong disease resistance package, (including HR to Fusarium Wilt, Verticillium Wilt and Anthracnose; R to Phytophthora Root Rot) promoting quick establishment and long stand life
- Great standability for intensive management systems
- Dark green, fine-stemmed, and a highly palatable HQ variety
- Very well-adapted and selected for use in the Western U.S. and Southern Plains

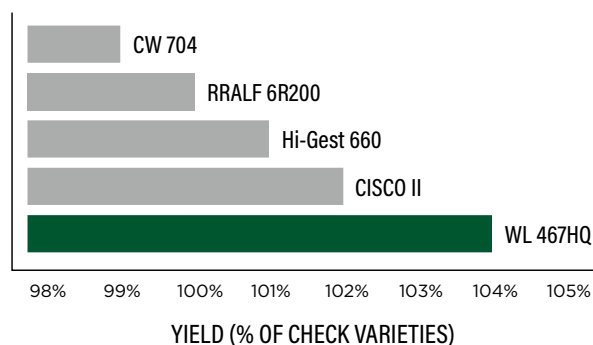
### WL 467HQ Outyields the Competition in the West\*

#### NAMPA, ID 2011-2013



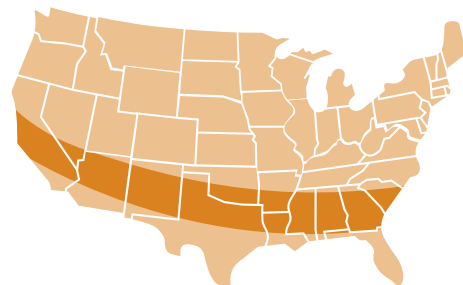
### WL 467HQ Outyields the Competition in the West\*

#### KS 2020-2022





AGRONOMIC TRAITS		PEST RESISTANCE TRAITS	
Fall Dormancy	6.0	Bacterial Wilt	High Resistance
Winter Activity	Moderate	Fusarium Wilt	High Resistance
Digestibility	Superior	Verticillium Wilt	Resistance
Persistence Index	Very High	Anthrachnose (Race 1)	High Resistance
Recovery After Harvest	Very Fast	Phytophthora Root Rot	High Resistance
Standability	Excellent	Aphanomyces Root Rot (Race 1)	Resistance
Multileaf Expression	Moderate	Spotted Alfalfa Aphid	Resistance
Salt Tolerance	Germination	Pea Aphid	High Resistance
		Stem Nematode	High Resistance
		Root-Knot Nematode (Northern)	High Resistance



Area of Primary Adaptation



\* Results are based on controlled field trials at the listed W-L Alfalfa location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Our first non-dormant release of HarvXtra® Alfalfa, a game changer for the Southwest

HVX840RR Brand, the latest release in the W-L HarvXtra® Alfalfa lineup, offers exciting harvest flexibility accomplished by reduced lignin content.

### HVX840RR Brand Advantages

- HarvXtra® Alfalfa gives growers the ability to better manage the yield-versus-quality trade-off, offering more flexibility in cutting schedule to achieve improved forage quality or greater yield potential, when compared to conventional alfalfa at the same stage of maturity
- The HarvXtra® Alfalfa technology provides unprecedented flexibility by widening cutting windows, which gives growers the option at each cutting to:
  1. Maintain their normal harvest schedules for higher-quality forage, **or**
  2. Delay harvest for 5-7 days for increased yield potential, without sacrificing forage quality, compared to conventional alfalfa at the same stage of maturity
- HarvXtra® Alfalfa has on average 12-14% less lignin and 8-10% higher neutral detergent fiber digestibility (NDFD) than conventional alfalfa harvested at the same stage of maturity
- HarvXtra® Alfalfa is stacked with the Roundup Ready® Technology for unsurpassed weed control with excellent crop safety

### HVX840RR Brand Outyields the Competition\*

Variety	Forage Yield (% Commercial Checks)	Forage Quality (NDFD % Commercial Checks)
<b>SHAFTER, CA 2014-2016</b>		
<b>HVX840RR</b>	<b>104</b>	<b>114</b>
WL 552.RR	100	102
AmeriStand 855T RR	99	100
RRALF 8R100	84	100
<b>DOS PALOS, CA 2014-2016</b>		
<b>HVX840RR</b>	<b>104</b>	<b>108</b>
WL 552.RR	100	101
AmeriStand 855T RR	96	101
RRALF 8R100	—	—
<b>DAVIS, CA 2014-2016</b>		
<b>HVX840RR</b>	<b>105</b>	<b>108</b>
WL 552.RR	—	101
AmeriStand 855T RR	102	98
RRALF 8R100	92	99

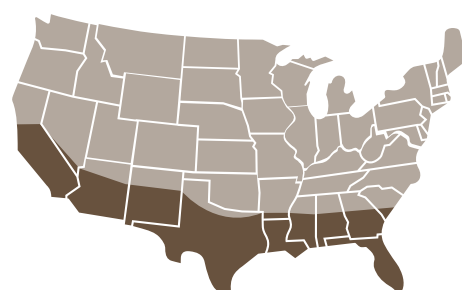


AGRONOMIC TRAITS	
Fall Dormancy	7.9
Winter Activity	High
Digestibility	HarvXtra®
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	Resistance
Fusarium Wilt	High Resistance
Anthracnose (Race 1)	Resistance
Phytophthora Root Rot	Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	Resistance
Stem Nematode	High Resistance

## Planting HVX840RR Brand utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliate stage to provide early weed control on new seedlings and lower seedling mortality
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



Area of Primary Adaptation

\* Data comes from FGI trials comparing HarvXtra® Alfalfa with Roundup Ready® Technology to commercial checks. Trials were seeded in 2013 and harvested in 2014, 2015, and 2016 from Shafter, CA, Don Palos, CA and Davis, CA

## Incredible yield potential backed by superb forage quality

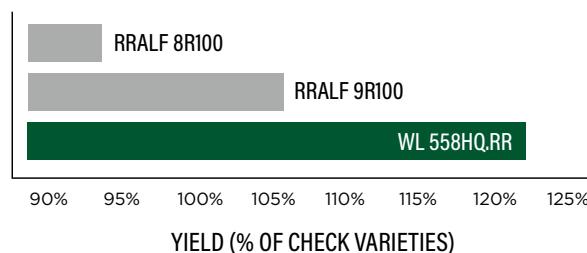
WL 558HQ.RR results from five years of intense forward breeding from WL 552HQ.RR with the focus on additional high yield potential, persistence, forage quality and increased pest resistance.

### WL 558HQ.RR Advantages

- Winter-active, non-dormant FD=8.0
- An ideal non-dormant variety for the cash hay producer, WL 558HQ RR produces big yield potential of leafy, fine-stemmed hay with dark green color and high feed value
- With an improved disease resistance package (including HR to Phytophthora Root Rot, Fusarium Wilt, Bacterial Wilt, Spotted Alfalfa Aphid and Pea Aphid and R to Anthracnose) it promotes fast seedling establishment and long stand life
- WL 558HQ.RR has excellent tolerance to leaf diseases, supports improved leaf retention, higher protein levels, and greater forage quality

### WL 558HQ.RR Outyields the Competition\*

SHAFTER, CA 2015-2017

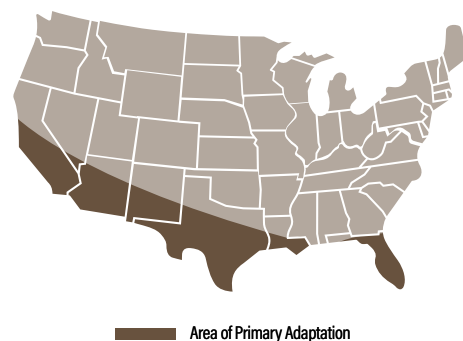


AGRONOMIC TRAITS	
Fall Dormancy	8.0
Winter Activity	High
Digestibility	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	Resistance
Anthrachnose (Race 1)	Resistance
Phytophthora Root Rot	High Resistance
Blue Alfalfa Aphid	Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	Resistance

## Planting WL 558HQ.RR and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control when establishing new stands and in established stands can mean fewer weeds and higher-quality hay, which can result in higher forage quality and greater profit potential
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system means thicker stands and higher yield potential for the life of the stand
- Flexibility in timing herbicide applications allows alfalfa producers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- There is minimal wait (5 days) after a Roundup® application before haying/feeding



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Superb forage quality backed by high aphid resistance

WL 3847HQ.RR Brand, FD8 variety, is adapted to the Southwest geographies and is focused on high quality forage with high resistance to both pea and spotted alfalfa aphids.

### WL 3847HQ.RR Brand Advantages

- Winter-active, non-dormant FD=8.3
- Improved salt tolerance of germinating seeds\*
- Strong aphid resistance
- WL 3847HQ.RR is building on WL 558HQ.RR with several generations of breeding for improvements to disease and pest resistance, as well as persistence
- Combination of salt tolerance and high resistance to Phytophthora Root Rot provides improved establishment success



### WL 3847HQ.RR Brand Outyields the Competition\*

LOS BANOS, CA 2019-2021

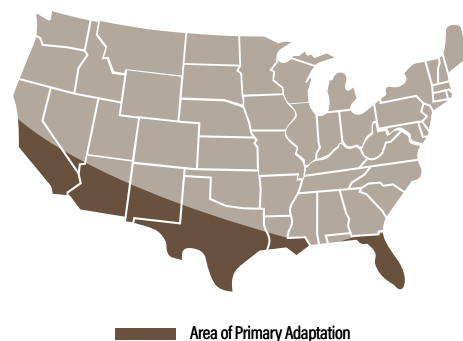
Variety	Fall Dormancy	2021 Forage Yield (% Commercial Checks)	2022 Forage Yield (% Commercial Checks)	2023 Forage Yield (% Commercial Checks)	Multi-Year
WL 3847HQ.RR Brand	8	121	138	131	126
6829R	8	97	79	98	92
RRALF 9R100	9	103	121	102	108

AGRONOMIC TRAITS	
Fall Dormancy	8.3
Winter Activity	High
Digestibility	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	Resistance
Fusarium Wilt	Resistance
Anthracnose (Race 1)	Resistance
Phytophthora Root Rot	High Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance

## Planting WL 3847HQ.RR Brand and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control when establishing new stands and in established stands can mean fewer weeds and higher-quality hay, which can result in higher forage quality and greater profit potential
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system means thicker stands and higher yield potential for the life of the stand
- Flexibility in timing herbicide applications allows alfalfa producers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- There is minimal wait (5 days) after a Roundup® application before haying/feeding



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## New non-dormant yield potential leader

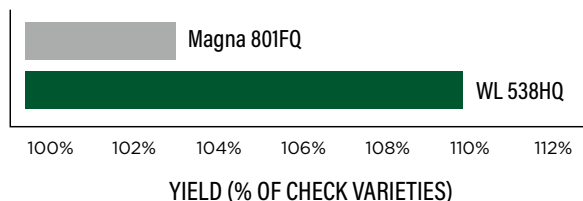
WL 538HQ is a new Fall Dormant 8, and is adapted to traditional western and southwestern non-dormant zones. This variety combines exceptional yield and good forage quality potential along with exceptional stand persistence. This variety is an excellent choice for forage production in the non-dormant regions of the U.S. replacing WL 535HQ.

### WL 538HQ Advantages

- Winter-active, non-dormant FD=8.0
- Very high yield potential across a wide range of soil types and harvest schedules
- Highly resistant to all major aphid pests
- Resistant to all major nematode pests
- WL 538HQ is highly palatable; optimizes intake, milk production, and can help lower feed costs and increase profit potential
- Ideal variety for the cash hay producer: WL 538HQ supports high yield potential of leafy, fine-stemmed hay with high feed value and dark green color
- Outstanding persistence and long stand life even under intensive cutting schedules
- Very strong disease resistance package (including HR to Phytophthora Root Rot, Fusarium Wilt and Anthracnose Race 1) promotes fast stand establishment and longer stand life
- Excellent tolerance to leaf diseases provides improved leaf retention, higher protein levels, and greater forage quality
- Fast recovery after cutting

### WL 538HQ Outyields the Competition\*

CA 2018-2020



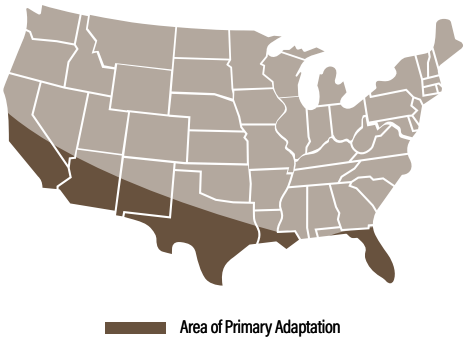


AGRONOMIC TRAITS	
Fall Dormancy	8.0
Winter Activity	High
Digestibility	Superior
Persistence Index	Excellent
Recovery After Harvest	Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	Resistance
Anthracnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Aphanomyces (Race 1)	Moderate Resistance
Blue Alfalfa Aphid	High Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance

**WL 538HQ Delivers**

WL 538HQ can deliver big yield potential, exceptional feed value, and outstanding profit potential for both dairy and cash hay producers. WL 538HQ carries on the great HQ tradition set by WL 535HQ. Intense selection for parent plants with high forage quality traits (high % crude protein and excellent fiber digestibility) has resulted in an HQ alfalfa variety with superior hay quality. High forage yield potential plus exceptional feed value can equal greater profit potential, and WL 538HQ delivers.



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



## W-L Alfalfas latest non-dormant release of HarvXtra<sup>®</sup> Alfalfa in FD9

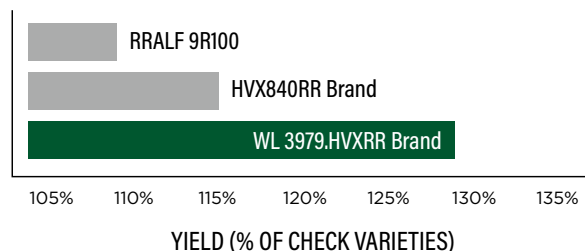
WL 3979.HVXRR Brand is the latest release in the W-L HarvXtra<sup>®</sup> Alfalfa lineup, offering exciting harvest flexibility accomplished by reduced lignin content for FD9 growers.

### WL 3979.HVXRR Brand Advantages

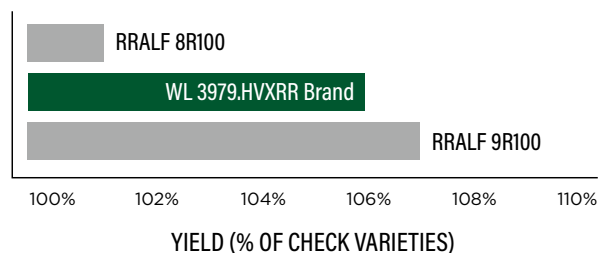
- Winter-active, non-dormant FD=9.0
- HarvXtra<sup>®</sup> Alfalfa gives growers the ability to better manage the yield-versus-quality trade-off, offering more flexibility in cutting schedule to achieve improved forage quality or greater yield potential when compared to conventional alfalfa at the same stage of maturity
- The HarvXtra<sup>®</sup> Alfalfa technology provides unprecedented flexibility by widening cutting windows, which gives growers the option at each cutting to:
  1. Maintain their normal harvest schedules for higher-quality forage, **or**
  2. Delay harvest for 5-7 days for increased yield potential, without sacrificing forage quality, compared to conventional alfalfa at the same stage of maturity
- HarvXtra<sup>®</sup> Alfalfa has on average 12-14% less lignin and 8-10% higher neutral detergent fiber digestibility (NDFD) than conventional alfalfa harvested at the same stage of maturity
- HarvXtra<sup>®</sup> Alfalfa is stacked with the Roundup Ready<sup>®</sup> Technology for unsurpassed weed control with excellent crop safety

### WL 3979.HVXRR Brand Outyields the Competition\*

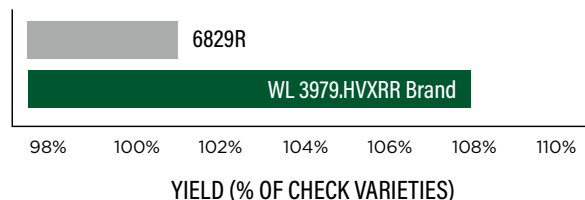
#### LOS BANOS, CA 2018



#### DAVIS, CA 2018



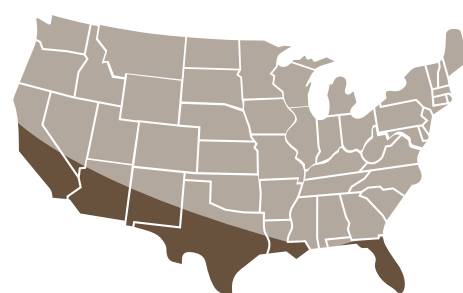
#### MARICOPA, AZ 2018



AGRONOMIC TRAITS		PEST RESISTANCE TRAITS	
Fall Dormancy	9.0	Bacterial Wilt	Moderate Resistance
Stand Persistence	Excellent	Fusarium Wilt	High Resistance
Early Seeding Vigor	Excellent	Verticillium Wilt	Resistance
Recovery After Harvest	Fast	Anthrachnose (Race 1)	High Resistance
Leaf Retention	Excellent	Phytophthora Root Rot	High Resistance
Plant Color	Dark Green	Pea Aphid	High Resistance
Salt Tolerance	Germination	Spotted Alfalfa Aphid	High Resistance
		Stem Nematode	Resistance

### Planting WL 3979.HVXRR Brand utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliate stage to provide early weed control on new seedlings and lower seedling mortality
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



Area of Primary Adaptation

\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Yield packed potential backed by superb forage quality

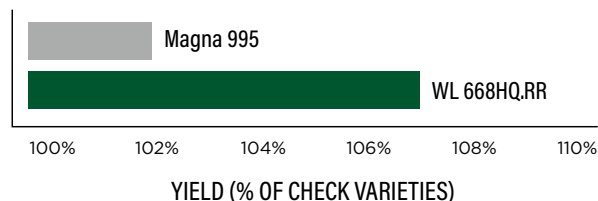
FD9 variety, WL 668HQ.RR, provides growers looking for the continued advantage of W-L Alfalfa's non-dormant program based on optimal yield potential, solid forage quality, and unrivaled persistence adapted to a wide geography. WL 668HQ.RR is a top pick for cash hay and dairy producers looking to maximize per acre profitability or milk/ton while utilizing the Roundup Ready® weed control system.

### WL 668HQ.RR Advantages

- Winter-active, non-dormant FD=9.3
- Highly resistant/resistant to all major aphid and nematode pests
- Solid disease package supporting strong seedling establishment and enhanced persistence
- Ideal non-dormant variety for the cash hay or dairy producer: WL 668HQ.RR produces big yields of leafy, fine-stemmed hay with dark green color
- Quick regrowth and canopy closure coupled with Roundup Ready® system should keep invasive weeds minimized
- Excellent tolerance to leaf diseases delivers improved leaf retention and overall forage quality

### WL 668HQ.RR Outyields the Competition\*

CA 2019-2022



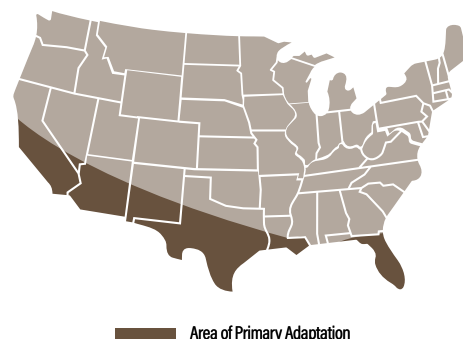


AGRONOMIC TRAITS	
Fall Dormancy	9.3
Winterhardiness	Very High
Maturity	Early
Digestibility	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	High Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	Resistance
Anthrachnose (Race 1)	High Resistance
Phytophthora Root Rot	High Resistance
Blue Alfalfa Aphid	Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance
Root-Knot Nematode (Northern)	High Resistance

### Planting WL 668HQ.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliate stage to provide early weed control on new seedlings and lower seedling mortality
- The simplicity of using a single herbicide (Roundup®) provides optimal weed control with no need to tank mix
- Flexibility in timing of application allows growers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- Minimal wait (5 days) after Roundup® application before haying/feeding



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Yield-packed potential backed by high resistance to stem nematode

WL 3968HQ.RR Brand, an FD9 variety, provides growers looking for the continued advantage of W-L Alfalfa's non-dormant program based on optimal yield potential, solid forage quality, high resistance to stem nematodes and resistance to aphids. WL 3968HQ.RR brand, building on WL 668HQ.RR, is a top pick for cash hay and dairy producers looking to maximize per acre profitability or milk/ton while utilizing the Roundup Ready® weed control system.

### WL 3968HQ.RR Brand Advantages

- Winter-active, non-dormant FD=9.3
- Solid disease package supporting strong seedling establishment and enhanced persistence
- Highly resistant to Stem Nematode and Phytophthora Root Rot
- Ideal non-dormant variety for the cash hay or dairy producer: WL 3968HQ.RR Brand produces big yields of leafy, fine-stemmed hay with dark green color
- Quick regrowth and canopy closure coupled with Roundup Ready® system should keep invasive weeds minimized
- Excellent tolerance to leaf diseases delivers improved leaf retention and overall forage quality



### WL 3968HQ.RR Brand Outyields the Competition\*

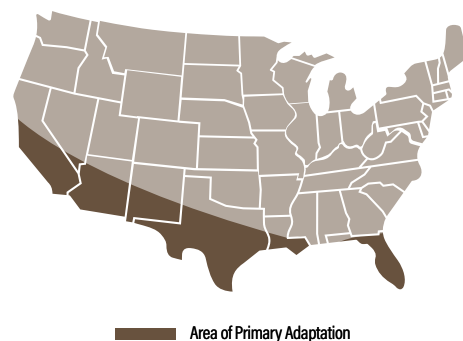
#### CALIFORNIA 2020-2022

Variety	Forage Yield (% Commercial Checks)			Grand Mean
	Davis, CA	Los Banos, CA	Los Banos, CA (2)	
WL 3968HQ.RR Brand	108	130	115	118
6829R	99	91	95	95
RRALF 9R100	101	109	105	105
Magna 801FQ	—	101	—	101
Magna 995	—	109	—	109

AGRONOMIC TRAITS		PEST RESISTANCE TRAITS	
Fall Dormancy	9.3	Bacterial Wilt	Resistance
Winterhardiness	Very High	Fusarium Wilt	High Resistance
Maturity	Early	Anthracnose (Race 1)	High Resistance
Digestibility	Superior	Phytophthora Root Rot	High Resistance
Recovery After Harvest	Very Fast	Aphanomyces (Race 1)	Resistance
Standability	Excellent	Pea Aphid	Resistance
Salt Tolerance	Germination	Spotted Alfalfa Aphid	High Resistance
		Stem Nematode	High Resistance

## Planting WL 3968HQ.RR Brand and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- Exceptional weed control when establishing new stands and in established stands can mean fewer weeds and higher-quality hay, which can result in higher forage quality and greater profit potential
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system means thicker stands and higher yield potential for the life of the stand
- Flexibility in timing herbicide applications allows alfalfa producers utilizing the Roundup Ready® system to spray when necessary; no carryover or crop rotation limitations
- There is minimal wait (5 days) after a Roundup® application before haying/feeding



\* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

## Conventional with yield potential in the West

Exceptional yield potential, broad adaptation, and excellent hay quality makes WL 656HQ the non-dormant alfalfa variety of choice for cash hay and dairy producers looking to maximize both production and profit potential.

### WL 656HQ Advantages

- Winter-active, very non-dormant FD=9.3
- Very high yield potential and outstanding persistence across a wide range of soil types and harvest schedules
- Supports optimal milk and profit potential when fed
- A great choice for cash hay; WL 656HQ can deliver very high forage quality across a wide range of haying conditions
- Proven ability to “hold” high feed value in the field over a longer period of time; WL 656HQ helps deliver higher forage quality and greater harvest flexibility with less risk of damage to hay and haylage when harvest is delayed
- Highly resistant to all major disease, insect, and nematode pests that attack alfalfa in the Southwestern U.S.
- Very fast recovery after cutting and optimal standability encourages intensive harvest management
- Great visual appeal in the field; dark green, leafy, fine stemmed, and tolerant to leaf disease

### WL 656HQ: HQ Leader\*

#### SHAFTER, CALIFORNIA 2006-2008

Variety	CP	RFQ
<b>WL 656HQ</b>	<b>22.9</b>	<b>179</b>
WL 625HQ	22.4	172
CW 907	22.0	170
Pioneer® 59N49	21.5	161
Cuf 101	22.3	161
Magna 901	22.2	157
S&W 9720	21.6	155

CP = Crude Protein RFQ = Relative Forage Quality

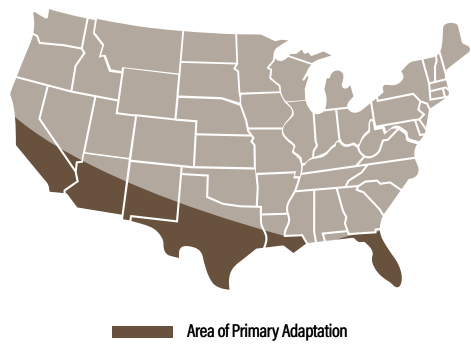
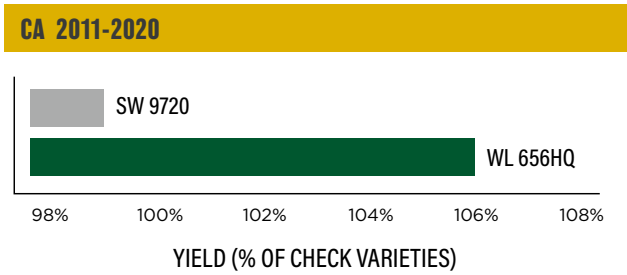




AGRONOMIC TRAITS	
Fall Dormancy	9.3
Digestibility	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Salt Tolerance	Germination

PEST RESISTANCE TRAITS	
Bacterial Wilt	Moderate Resistance
Fusarium Wilt	High Resistance
Verticillium Wilt	High Resistance
Anthracnose (Race 1)	Resistance
Phytophthora Root Rot	High Resistance
Blue Alfalfa Aphid	High Resistance
Pea Aphid	High Resistance
Spotted Alfalfa Aphid	High Resistance
Stem Nematode	High Resistance
Root-Knot Nematode (Southern)	High Resistance

### WL 656HQ Outyielded a Leading Competitor in CA\*



### WL 656HQ Delivers Outstanding Performance

Our newest conventional, very non-dormant HQ (high quality-selected) alfalfa, WL 656HQ carries on in the great tradition set by WL 625HQ: Very high yield potential, outstanding persistence, and exceptional hay quality. WL 656HQ offers a unique combination of high yield potential and high hay quality, producing outstanding per-acre profit potential when compared to the competition. With excellent levels of resistance to all important disease, aphid, and nematode pests, WL 656HQ is clearly the non-dormant alfalfa to beat.

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# SEED TREATMENTS & COATINGS

## Standard Seed Treatment Package Offerings

TREATMENT OPTIONS	TREATMENT DESCRIPTION	STAMINA®	APRON XL®	NITRAGIN GOLD®	OPTIMIZE GOLD®	MICRO-NUTRIENTS	OMRI LISTED
<b>GOLD® TREATMENT PLUS</b> 34% Nutrient Coat	COS	✓	✓	✓	✓	✓	
<b>APEX GREEN</b> 34% Organic Coat <small>ONLY AVAILABLE ON SPECIFIC PRODUCTS</small>	OC			✓			✓

### GOLD® TREATMENT PLUS Advantages:

#### Better emergence in wet or dry conditions

- Up to 20% better emergence than preinoculated uncoated seed (U of MN and CA data)
- Micronutrients surrounding the seed increases germination and emergence
- Controls early season diseases that attack new seedlings in wet environments

#### Optimal nodule formation for improved nitrogen fixation

- Unique mix of Rhizobium strains improves nodulation and promotes nitrogen-fixation

#### Optimal stand establishment

- Root and shoot development is enhanced and independent of soil conditions
- Early start improves plant health with multi-season benefits of greater yield potential
- Smooth finish and uniform seed size improves planting accuracy
- Ideal for reduced tillage

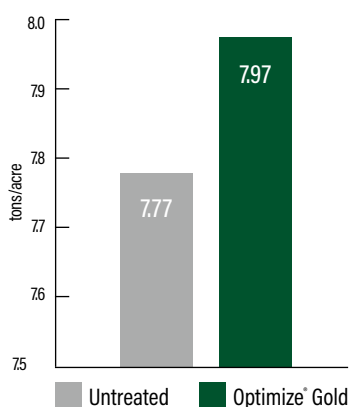
#### Example of Treated Root System



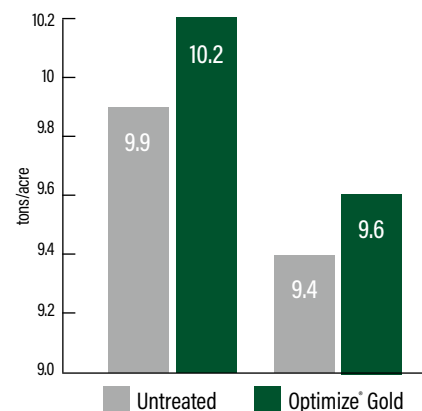
Untreated

Treated with  
OPTIMIZE GOLD®

#### Yield Summary Solid ROI-Multi-year (43 Trials)



#### Continued returns with 2nd year crop (4 trials)



# SEED TREATMENTS & COATINGS

## **GOLD® TREATMENT PLUS Proprietary Package Contains:**

### ✓ **OPTIMIZE® GOLD WITH LCO PROMOTER TECHNOLOGY® FOR ALFALFA**

When present at the time of planting, LCO Promoter Technology® enables your crop to achieve its full genetic potential by enhancing nutritional capabilities that drive natural growth processes, maximizing plant health and crop performance.

### ✓ **STAMINA® FUNGICIDE**

Protects seed and new seedlings from fungal disease and enhance plant health, especially under tough soil conditions with elevated disease pressure. May result in higher germination rates, increased nodulation, healthier roots and larger plants.

### ✓ **APRON XL® FUNGICIDE**

Protects against seedling damping-off diseases, especially in cool wet soils.

### ✓ **NITRACIN® GOLD**

Specially selected natural rhizobia strains (pre-inoculant) result in high levels of nitrogen fixation for maximum yields.

### ✓ **MICRONUTRIENTS**

Assists in early vigor and stand establishment.

### ✓ **PROTECTIVE COATING**

Preserves and extends shelf life of active rhizobia within seed treatment.





# SEED TREATMENTS & COATINGS

## Stamina® Fungicide Benefits

### Why use Stamina®?

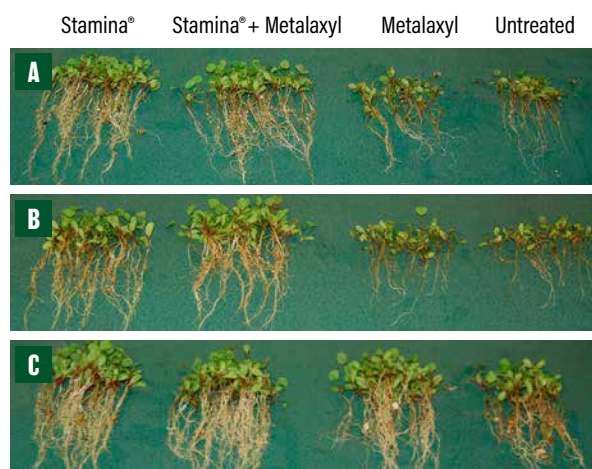
Powered by F500® fungicide, the same active ingredient that is in Headline® fungicide

Stamina® is a broad spectrum, seed-applied fungicide that provides suppression of seed and emerging seedling disease caused by these target diseases:

- Aphanomyces euteiches
- Rhizoctonia solani
- Fusarium spp.
- Phytophthora medicaginis

Seed treated with Stamina® results in:

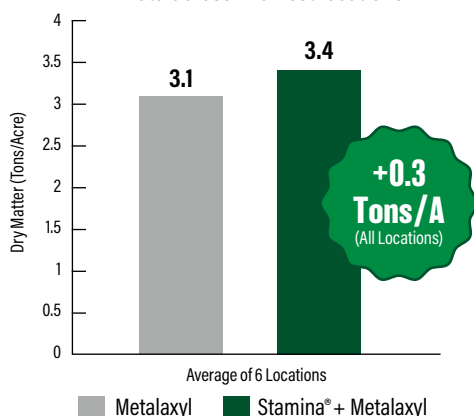
- A healthier stand with faster developing plants
- Increased forage yield
- More rapid and increased emergence of seedlings even under certain cold conditions



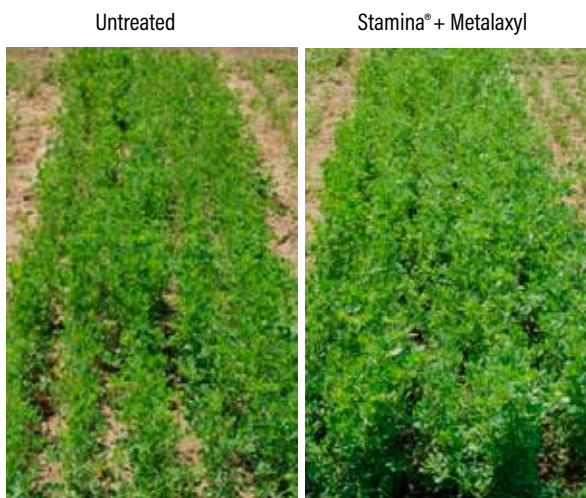
Seedlings inoculated with (A) Aphanomyces euteiches Race 1. (B) Aphanomyces euteiches Race 2 (C) Phytophthora medicaginis. Stamina applied at 3.1 fl oz/cwt & metalaxyl applied at 0.91 fl oz/cwt. 2011 Laboratory test conducted by an independent third party researcher.

### Summary of Alfalfa Forage Yield, Seeding Year

Data across Midwest locations



Stamina applied at 3.1 fl oz/cwt. Metalaxyl applied at 0.91 fl oz/cwt. 2013 replicated trials conducted in West Salem, WI.



Alfalfa spring seeded May 6, 2013. Photos taken on June 29, 2013 in West Salem, WI. 54 Days After Seeding. Stamina 3.1 fl oz/cwt, metalaxyl 0.91 fl oz/cwt.



## UltraCut™ Disease Package Offers Protection and Yield Potential

### Advanced disease resistance you can rely on

The best way to protect against evolving Anthracnose and Aphanomyces threats in your alfalfa stands is to plant a variety with more advanced resistance. The UltraCut™ Disease Package helps you grow a healthy alfalfa crop even in field conditions susceptible to Anthracnose and Aphanomyces disease strains. Its protection can help deliver an advantage through improved agronomic performance and yield potential.

Crown, stem and root diseases can cause significant impact on alfalfa yield, quality and persistence. The UltraCut™ Disease Package enables strong stand establishment through unmatched seedling genetic disease resistance. Without disease-resistant seed, if your plants are subjected to these diseases, the damage can be yield limiting and sometimes fatal. You may have to terminate your stand and start over in soil that's possibly still contaminated with the disease strains.

See healthier stands and more yield in your fields\* by planting varieties with the UltraCut™ Disease Package.

\*Compared to varieties without the UltraCut™ alfalfa disease package in fields with disease pressure.



UltraCut™ varieties (in the middle) compared to susceptible competitive check varieties (on outsides). Photo taken at FGI Research Facility, June 2018, West Salem, WI

UltraCut™ Disease Package is available in:  
WL 3521HQ • WL 375HVX.RR • WL 349HQ • WL 3471.HVXRR • WL 3451HQ.RR





## Experience the many advantages of Roundup Ready® Alfalfa



### Easier weed control

Get unsurpassed control of broadleaf and grass weeds, as well as suppression of most persistent, parasitic or poisonous weeds.



### Cleaner stand establishment

Roundup Ready® Alfalfa's weed control helps you establish a strong stand.



### Decreased damage from herbicides

Roundup Ready® systems provide excellent crop safety compared to conventional herbicides, with no crop rotation restrictions.



### Flexibility in application timing

Enjoy the broadest application timing window for both crops and weeds. Wait only five days before grazing or harvest.

### Controlling weed pressure during establishment provides these benefits:

#### ✓ MORE YIELD POTENTIAL

Roundup Ready® Alfalfa lowers weed pressure early on, leading to greater yield potential.

#### ✓ MORE SAVINGS POTENTIAL

Enjoy lower herbicide costs compared to conventional herbicide options.

#### ✓ MORE QUALITY POTENTIAL

With fewer weeds in every ton, you can harvest a higher percentage of pure alfalfa.

#### ✓ MORE PERSISTENCE POTENTIAL

The Roundup Ready® Alfalfa trait helps establish a strong stand, giving you thicker, denser alfalfa year after year.



Learn more at [RoundupReadyAlfalfa.com](http://RoundupReadyAlfalfa.com)





## An alfalfa that gives you options. Not limits.

The genetically enhanced HarvXtra® Alfalfa technology fundamentally changes the relationship between forage quality and stage of maturity by modifying lignin content (ADL) beyond what is possible with conventional breeding techniques.

### Introducing HarvXtra® Alfalfa with Roundup Ready® Technology

It's the industry's first genetically enhanced alfalfa developed to maximize quality compared to conventional alfalfa at the same stage of maturity, by reducing the amount of lignin in the plant.

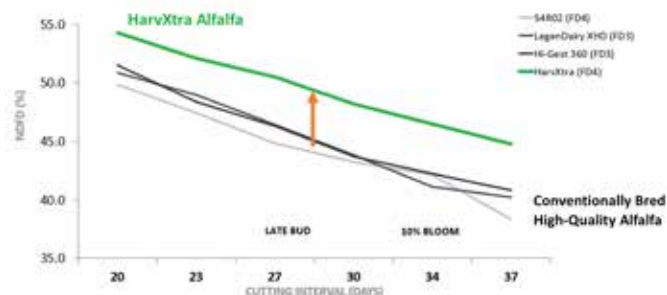
It's now available in WL 375HVX.RR, WL 3471.HVXRR, HVX3686RR Brand, WL 3979.HVXRR Brand and HVX840RR Brand varieties. And the biggest advancement in the field. HarvXtra® Alfalfa with Roundup Ready® technology gives you unprecedented flexibility by widening cutting windows. This gives you the ability to better manage the yield-versus-quality trade-off. It also adds unsurpassed weed control with Roundup Ready® technology.

- Choose to maintain your current harvest schedule for higher quality forage, **or**
- Delay harvest a few days for increased tonnage without sacrificing acceptable forage quality.

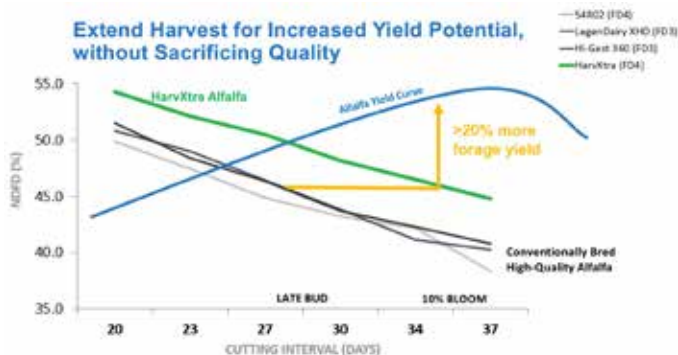
### It's a True Game Changer

By reducing the amount of lignin in the plant, the HarvXtra® Alfalfa trait technology fundamentally changes the relationship between forage quality and stage of maturity. Less acid detergent lignin (ADL) and higher neutral detergent fiber digestibility (NDFD) improves digestibility and can command a higher price per ton come harvest.

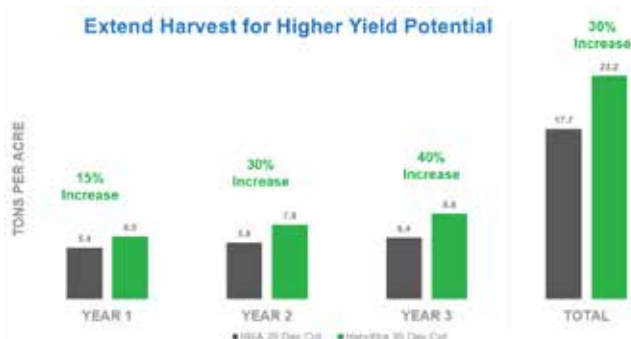
#### HarvXtra® Alfalfa Delivers Exceptional Forage Quality



#### Extend Harvest for Increased Yield Potential, without Sacrificing Quality



#### Extend Harvest for Higher Yield Potential



Learn more at [HarvXtra.com](http://HarvXtra.com)



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**WLALFALFAS.COM**

**HARVXTRA**  
with Roundup  
Ready® Technology

**Roundup  
Ready®**  
ALFALFA

**ULTRA/CUT™**  
Alfalfa Overseed Package

**HQ™**



In the following states, purchase and use of HarvXtra® Alfalfa with Roundup Ready® 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 United 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® Technology in Imperial County, California, pending import approval and until Forage Genetics International, LLC (FGI) grants express permission for such planting.

Forage Genetics International, LLC ("FGI") is a member of Excellence Through Stewardship® (ETS). FGI products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with FGI's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. HarvXtra® Alfalfa with Roundup Ready® Technology and Roundup Ready® Alfalfa have pending import approvals. GROWERS MUST DIRECT ANY PRODUCT PRODUCED FROM HARVXTRA® ALFALFA WITH ROUNDUP READY® 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. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Growers should refer to <http://www.biotradestatus.com/> for any updated information on import country approvals. Excellence Through Stewardship® is a registered trademark of Biotechnology Industry Organization.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready® crops contain genes that confer tolerance to glyphosate. Glyphosate herbicides will kill crops that are not tolerant to glyphosate.

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