



· SINCE ·

1958

2022 SEED GUIDE



A Global Leader

IN ALFALFA TECHNOLOGY

The legacy of W-L Alfalfas is second to no one. 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® 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.

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WL 336HQ.RR

EXCEPTIONAL YIELD POTENTIAL WITH SUPERB WINTERHARDINESS

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.

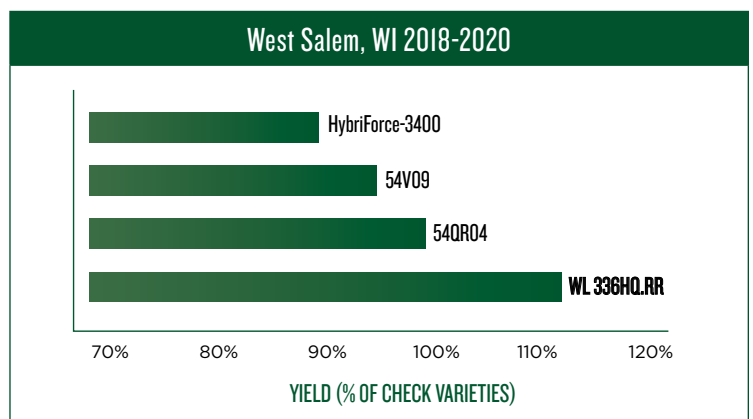
WL 336HQ.RR Advantages

- Superb yield potential under 2-, 3- to 4-cut harvest management systems
- Quick regrowth in a FD3, that delivers potential for high yields and long stand life
- Very winterhardy (WH=1.0); WL 336HQ.RR 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
- An almost perfect 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

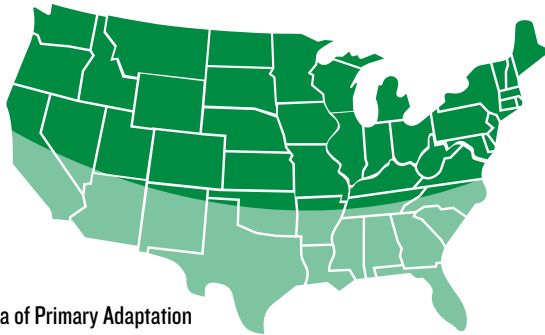
Planting WL 336HQ.RR alfalfa and utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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

WL 336HQ.RR Outyields the Competition*



* 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.



■ Area of Primary Adaptation

WL 336HQ.RR Forage Quality Analysis*

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

CP= Crude Protein IVTD = In Vitro True 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 Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

HQ™

**Roundup
Ready**
ALFALFA

AGRONOMIC TRAITS

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

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracoese	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	R
Leaf Disease	R
Pea Aphid	HR
Spotted Alfalfa Aphid	R
Stem Nematode	MR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 319HQ

EXCEPTIONAL WINTERHARDINESS AND OUTSTANDING PROFIT POTENTIAL

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.

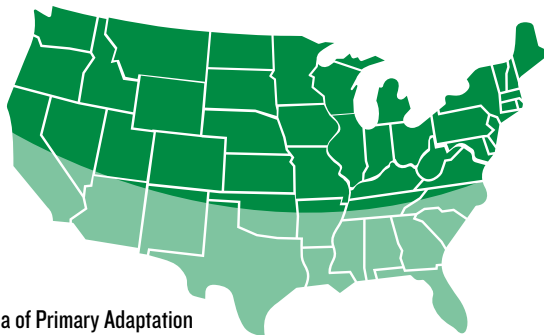
WL 319HQ Advantages

- Very high yield potential under both 3- and 4-cut harvest managements
- 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

Washington State Univ., Othello 2001	
Variety	Yield (T/A)
WL 319HQ	16.1
Pioneer® 54Q25	16.0
Vitro	15.7
HybriForce™-400	15.0
Reward II	14.5
Vernal	12.4

LSD 5% 1.15

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.



WL 319HQ Forage Quality Analysis*

Boone, IA, 2001

Variety	CP	% IVTD
WL 319HQ	23.4	79.4
Geneva	22.6	78.1
Magnum V	21.9	76.2
Pioneer® 53Q60	21.9	78.2

La Crosse, WI, 2001

Variety	CP	%IVTD
WL 319HQ	22.3	77.1
Magnum V	20.6	75.1
Affinity +Z	21.8	75.2
Pioneer® 53Q60	21.0	74.9

Mount Joy, PA, 2001

Variety	CP	%IVTD
WL 319HQ	25.2	82.6
Geneva	25.0	82.4
Magnum V	24.3	81.6
Pioneer® 54V54	24.0	81.0

CP = Crude Protein IVTD = In Vitro True Digestibility

* 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.

HQ™

AGRONOMIC TRAITS

Maturity	Medium
Fall Dormancy	2.8
Winterhardiness	1.3
Digestibility	Excellent
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	30/30

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race I)	HR
Leaf Disease	R
Pea Aphid	R
Spotted Alfalfa Aphid	R
Stem Nematode	MR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 341HVX.RR

ALFALFA REINVENTED

The New Standard of Yield Potential and Quality with W-L HarvXtra® Alfalfa

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. Our first release, WL 341HVX.RR provides growers with expanded flexibility in cutting schedule to protect forage quality, or the ability to greatly enhance fiber digestibility and overall feed value while maintaining current harvest timing. Either option delivers tremendous value no matter the type of grower or operation.

WL 341HVX.RR Advantages

WL 341HVX.RR 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 341HVX.RR at least a 15% greater RFQ (relative forage quality) and NDFD (neutral detergent fiber digestibility).

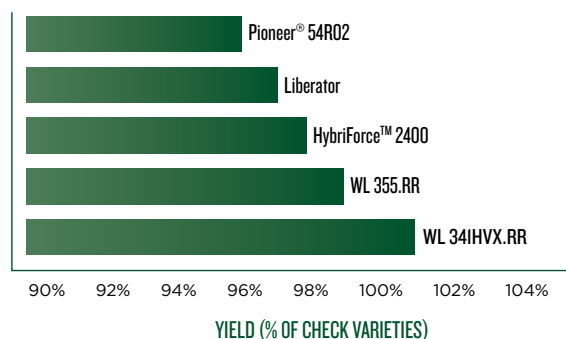
- Superb yield potential and agronomic characteristics under 3-cut system if extending cutting frequency, or under 4- to 5-cut systems to maximize feed value
- An almost perfect Disease Resistance Index (34/35) and very winterhardy, (2.1), delivering long stand life under tough growing conditions
- WL 341HVX.RR 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
- Quick stand establishment with WL 341HVX.RR that comes fully-loaded with W-L's The Gold Treatment® PLUS seed coating treatment containing Stamina® fungicide

Planting WL 341HVX.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

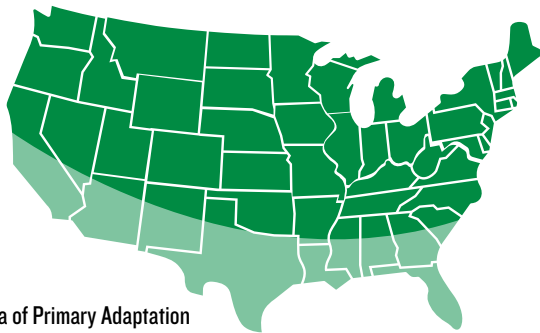
- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliolate stage to provide 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

WL 341HVX.RR Outyields the Competition*

West Salem, WI 2014-2016



* 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.



■ Area of Primary Adaptation

WL 34IHVX.RR Firmly Establishes a New Level of Fiber Digestibility and Feed Value*

Boone, IA; Mt. Joy, PA; West Salem, WI 2015-2016

Variety	ADL	NDFD	RFQ
WL 34IHVX.RR	78%	117%	123%
WL 355.RR	100%	98%	100%
Pioneer® 54R02	99%	99%	99%
HybriForce™ 2400	100%	102%	101%
Liberator	96%	103%	107%

ADL = Acid Detergent Lignin 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 Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

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.



AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	4.0
Winterhardiness	2.1
Digestibility/Feed Value	HarvXtra®
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	34/35
Salt Tolerance	Germination

*HarvXtra® Alfalfa with Roundup Ready® Technology

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthraxnose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	R
Pea Aphid	R
Spotted Alfalfa Aphid	HR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 3471.HVXRR

HARVXTRA® ALFALFA WITH ROUNDUP READY® TECHNOLOGY AND THE LATEST DISEASE PACKAGE ON THE MARKET

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).

- Superb yield potential and agronomic characteristics under 3-cut system if extending cutting frequency, or under 4- to 5-cut systems to maximize feed value
- Our newest disease resistance greatly effecting establishment and in-crop performance, WL 3471.HVXRR's Disease Resistance Index (DRI) of 39/40 also includes HR (high resistance) to enhanced multi-race aphanomyces¹, and resistance to anthracnose race 5²
- 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

Planting WL 3471.HVXRR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

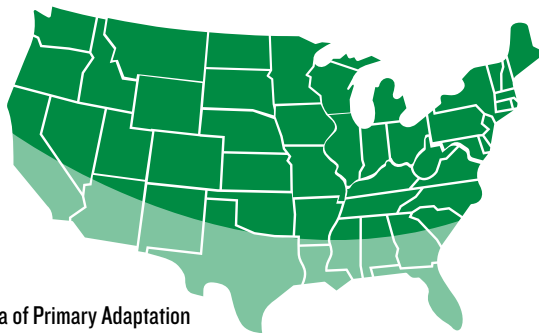
- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage
- Exceptional crop safety at all growth stages with the Roundup Ready® weed control system
- Recommended 1st glyphosate application at 1st-3rd trifoliolate stage to provide 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

WL 3471.HVXRR Outyields the Competition*

Data from FGI in listed locations in 2016-2018

Variety	Yield (% of check varieties)		
	West Salem, Wisconsin	Boone, Iowa	Mount Joy, Pennsylvania
WL 3471.HVXRR	114	98	104
54R02	100	-	105
54QR04	-	100	-
54V09	-	97	-
Hi Gest 360	104	102	98
HybriForce 3400	97	100	100
Attention II	93	91	98

* Results are based on controlled field trials at the listed W-L Alfalfas research 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.



■ Area of Primary Adaptation

WL 3471.HVXRR Firmly Establishes a New Level of Fiber Digestibility and Feed Value*

Data from FGI Research locations at West Salem, WI; Boone, IA; Mount Joy, PA 2016-2018

Variety	%ADL	%NDFD	%RFQ
WL 3471.HVXRR	78	117	120
54R02	102	98	95
HI Gest 360	97	104	105
HybriForce 3400	98	102	103
Attention II	103	98	98

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.

* Results are based on controlled field trials at the listed W-L Alfalfas research 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.

¹Includes 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.

²Includes race 1 protection, along with Anthracnose Race 5, which was recently confirmed by USDA's Agricultural Research Service.



AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	4.3
Winterhardiness	1.9
Digestibility/Feed Value	HarvXtra®
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	39/40

*HarvXtra® Alfalfa with Roundup Ready® Technology

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race 1)	HR
Anthracnose (Race 5) ²	R
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Aphanomyces Enhanced Multi-Race ¹	HR
Pea Aphid	R
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 356HQ.RR

OUTSTANDING YIELD POTENTIAL AND FORAGE QUALITY

With Powerful Protection on Your Toughest Soils

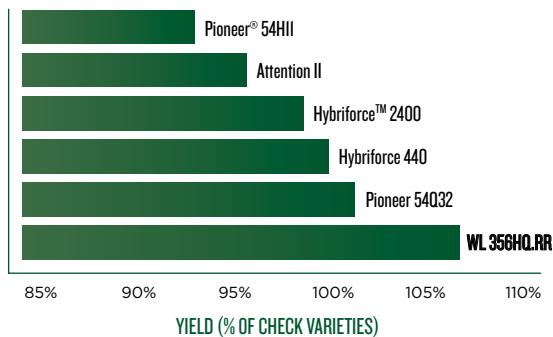
WL 356HQ.RR Advantages

- Very high yield potential under 3- to 5-cut harvest managements
- Unique wet soil disease resistance package (HR to Aphanomyces Race 2) promoting better stand establishment, persistence, and forage yield potential
- WL 356HQ.RR carries the "HQ" designation, exhibiting strong potential to deliver optimal feed intake, milk production, and profit potential when fed
- Very winterhardy (WH=1.6); WL 356HQ.RR delivers long stand life under adverse weather and soil conditions
- Highly resistant (HR) to stem nematode
- Perfect Disease Resistance Index (DRI) of 35/35 supports fast seedling establishment and long stand life
- 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

Planting WL 356HQ.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

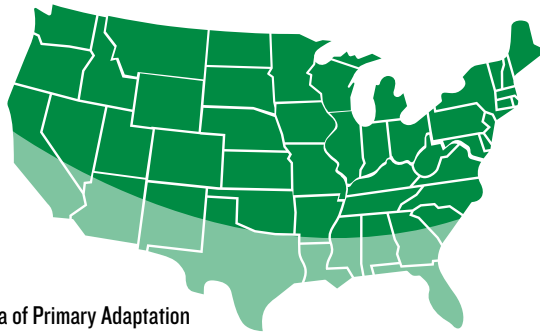
- Exceptional weed control at both stand establishment and in established stands means fewer weeds and higher-quality hay and haylage, which can result in more milk per ton fed and higher RFQ when tested
- Optimal crop safety at all growth stages with the Roundup Ready® weed control system delivers increased 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
- 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

West Salem, WI 2010-2011*



* 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.





■ Area of Primary Adaptation

WL 356HQ.RR Continues the “HQ” Tradition of Elite Forage Quality*

Boone, IA 2011

Variety	CP	IVTD	RFQ
WL 356HQ.RR	22.9	81.7	202
Pioneer® 53Q30	21.4	79.1	187
HybriForce™ 440	21.6	79.9	186
DKA 43-I3	20.8	76.7	172

CP = Crude Protein IVTD = In Vitro True 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 Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

Do You Need Dual-Race Aphanomyces Root Rot Resistance?

The Aphanomyces fungus prunes alfalfa roots, resulting in stunted, chlorotic plants and poor seedling establishment on wet soils. Most alfalfa varieties currently marketed in the U.S. are resistant to Race 1 Aphanomyces, but far fewer varieties are resistant to Race 2.

Race 2 Aphanomyces isolates are widespread and cause severe disease on Race 1-resistant varieties. University forage specialists throughout the Midwest and Northeast suggest that Race 2 Aphanomyces represents a widespread risk to alfalfa varieties that possess only Race 1 Aphanomyces resistance.

Planting alfalfa with high resistance to Race 2 Aphanomyces (WL 356HQ.RR) will significantly improve alfalfa stand establishment and productivity on heavy or poorly drained soils where root diseases are prevalent.

HQ™

**Roundup
Ready®**
ALFALFA

AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	3.8
Winterhardiness	1.6
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	35/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthraxnose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Spotted Alfalfa Aphid	MR
Pea Aphid	R
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 3441.RR

IMPROVED DISEASE PACKAGE AND ROUNDUP READY® FALL DORMANT 4

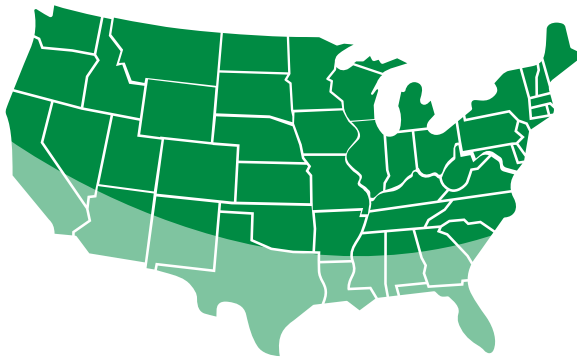
WL 3441.RR is a W-L breakthrough product, with enhanced multi-race Aphanomyces¹ disease package that offers growers the ability to help protect yield and quality potential.

WL 3441.RR Advantages

- Very high yield potential under 3- to 5-cut harvest managements
- Disease resistance package greatly effecting establishment and in-crop performance, WL 3441.RR Disease Resistance Index (DRI) of 35/35 also includes resistance to enhanced multi-race aphanomyces¹
- Very winterhardy (WH=2.0); WL 3441.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

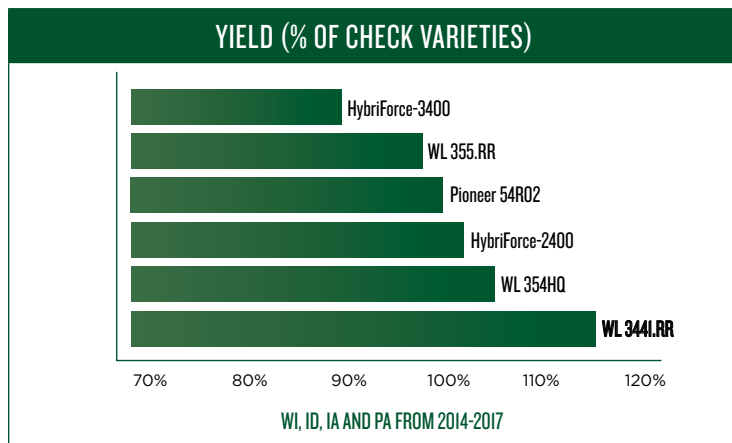
Planting WL 3441.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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



■ Area of Primary Adaptation

WL 344I.RR Outyields the Competition*



* Results are based on controlled field trials at the listed W-L Alfalfas research 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.

What does the new disease package mean for growers?

Disease resistance packages in W-L Alfalfas just took a major step-change up with the release of an enhanced multi-disease, multi-race resistance of *Aphanomyces* and Anthracnose, the industry's first. *Aphanomyces* fungus, prevalent in a great majority of key Midwest and Northeast alfalfa states, weakens alfalfa roots, resulting in stunted, chlorotic plants and poor seedling establishment in wet soil conditions, and a persistent drain on established stands. Many alfalfa seed varieties are available with Race 1 resistance, fewer are available with Race 2 resistance, but the enhanced multi-race resistance isolate is very unique.

¹Includes 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.

²Includes race 1 protection, along with Anthracnose Race 5, which was recently confirmed by USDA's Agricultural Research Service.



AGRONOMIC TRAITS

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

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Aphanomyces Enhanced Multi-Race ¹	R
Pea Aphid	R
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 359LH.RR

ENHANCED YIELD POTENTIAL AND QUALITY

With Outstanding Potato Leafhopper Resistance

The latest Roundup Ready® HopperShield™ potato leafhopper-resistant alfalfa variety from W-L Alfalfas. 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
- An almost perfect 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

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

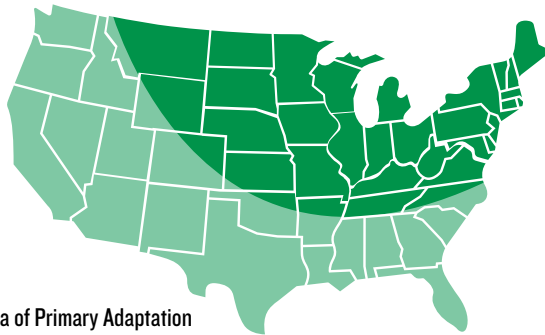
Treatment Thresholds for Potato Leafhoppers*

Spray thresholds from Iowa State University

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

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 Alfalfas's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

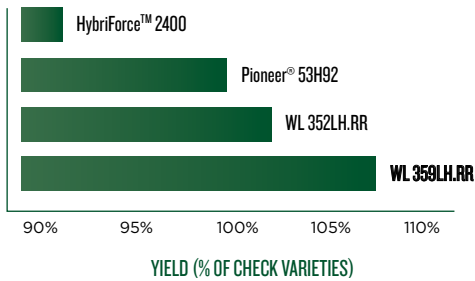


■ Area of Primary Adaptation

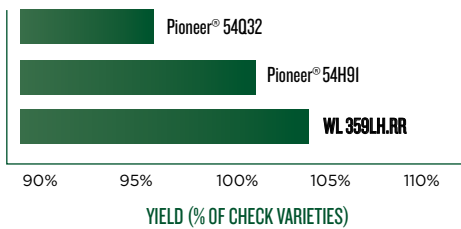


WL 359LH.RR Outyields the Competition*

Boone, IA 2012-2013



Mount Joy, PA. 2011-2012



* 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.

AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	3.9
Winterhardiness	2.2
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	High
Disease Resistance Index	34/35

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race I)	HR
Aphanomyces Root Rot (Race 2)	R
Potato Leafhopper	HR
Spotted Alfalfa Aphid	R
Pea Aphid	R
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 354HQ

EXCEPTIONAL PRODUCTIVITY AND PERSISTENCE ON YOUR TOUGHEST SOILS

Outstanding yield potential and exceptional forage quality on your toughest soils make WL 354HQ the alfalfa variety of choice for dairy, beef, and cash hay producers looking to significantly reduce the impact of root disease on seedling establishment and stand life.

WL 354HQ Advantages

- Unique wet soil disease resistance package (including HR to Aphanomyces Race 2) demonstrates on-farm benefits in stand establishment, persistence, and forage yield
- A perfect Disease Resistance Index (DRI) of 35/35
- Very high yield potential under 3- to 5-cut harvest managements; high yield potential across a wide range of soil types
- Excellent feed value and digestibility helps produce more milk or beef and greater profit potential when fed
- A great choice for cash hay: WL 354HQ delivers very high forage quality across a wide range of haying conditions
- Very winterhardy (WH=1.4); WL 354HQ delivers long stand life even under the toughest weather conditions
- Fast recovery after cutting and excellent standability encourages intensive harvest management
- Dark green, fine-stemmed, and highly palatable
- Very well-adapted for use in the Midwestern, Northern Plains, Pacific Northwest and Northeastern regions of the U.S. for hay and haylage uses

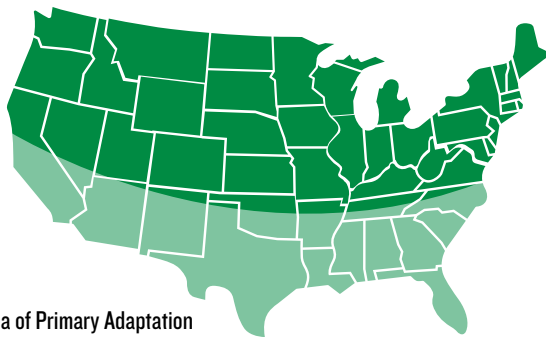
Geneseo, NY 2008-2009 Total Yield	
Variety	Yield (T/A)
WL 354HQ	18.28
Pioneer® 54V46	17.33
ReGen	16.89
Milestone	16.84
WL 348AP	16.66
Perform	16.56
AmeriStand 403T	15.36

West Salem, WI 2008-2009 Total Yield	
Variety	Yield (T/A)
WL 354HQ	14.92
Pioneer® 54V46	14.20
WL 357HQ	14.15
Pioneer® 54HII	12.02
HybriForce™-400	11.83

Nampa, ID 2008-2009 Total Yield	
Variety	Yield (T/A)
WL 354HQ	25.18
AmeriStand 444NT	24.65
Pioneer® 54V46	24.29
CW 500	23.04
Bullseye	22.38
HybriForce™-400	22.36

Marshfield, WI 2008-2009 Total Yield	
Variety	Yield (T/A)
WL 354HQ	16.32
Genoa	15.86
Pioneer® 54V46	15.15
WL 357HQ	14.96
HybriForce™-400	13.96

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.



■ Area of Primary Adaptation

WL 354HQ Delivers Greater Forage Quality*

Marshfield, WI, 2008-2009

Variety	CP	RFQ
WL 354HQ	19.9	151
CW 500	18.6	144
Pioneer® 54V46	18.2	146
HybriForce™ 400	18.5	150

CP = Crude Protein RFQ = Relative Forage Quality

* 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 Alfalfas.

Do You Need Dual-Race Aphanomyces Root Rot Resistance?

The Aphanomyces fungus prunes alfalfa roots, resulting in stunted, chlorotic plants and poor seedling establishment on wet soils. Most alfalfa varieties currently marketed in the U.S. are resistant to Race 1 Aphanomyces, but far fewer varieties are resistant to Race 2.

Race 2 Aphanomyces isolates are widespread and cause severe disease on Race 1-resistant varieties. University forage specialists throughout the Midwest and Northeast suggest that Race 2 Aphanomyces represents a widespread risk to alfalfa varieties that possess only Race 1 Aphanomyces resistance.

Planting alfalfa with high resistance to Race 2 Aphanomyces will significantly improve alfalfa stand establishment and productivity on heavy or poorly drained soils where root diseases are prevalent.

HQ™

AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	3.9
Winterhardiness	1.4
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	35/35
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthraxnose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Leaf Disease	R-HR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 349HQ

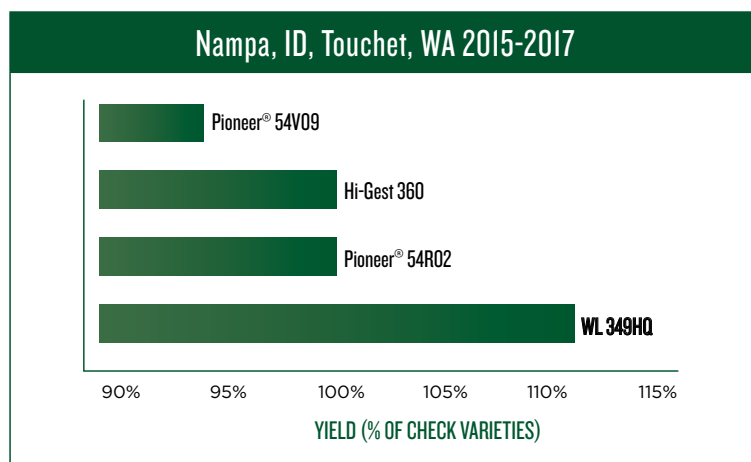
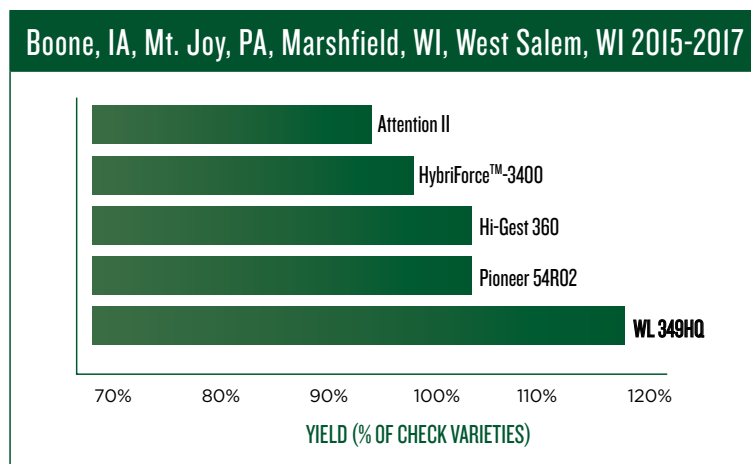
DISEASE PACKAGE RAISES ANTE ON YIELD POTENTIAL AND PERSISTENCE LEADERS

Broad disease resistance is always a priority on our research teams, constantly looking for additional tolerance across a wide geography. WL 349HQ is a new W-L breakthrough product, with an enhanced multi-race *Aphanomyces*¹ and *Anthraco*² 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.

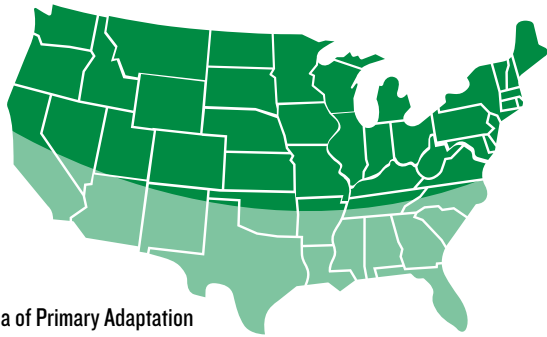
WL 349HQ Advantages

- Outstanding yield potential and agronomic performance under 4 to 5-cut harvest management systems (FD=4.4) in various locations throughout dormant alfalfa use areas
- A new day in disease resistance greatly effecting establishment and in-crop performance, WL 349HQ's perfect Disease Resistance Index (DRI) of 40/40 also includes HR (high resistance) to enhanced multi-race *Aphanomyces*¹, and HR to anthracnose race 1 and race 5²
- 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
- Enhanced 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.

WL 349HQ Outyields the Competition *



* 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.



■ Area of Primary Adaptation

What does the new disease package mean for growers?

Disease resistance packages in W-L Alfalfas just took a major step-change up with the release of an enhanced multi-disease, multi-race resistance of Aphanomyces and Anthracnose, the industry's first. Aphanomyces fungus, prevalent in a great majority of key Midwest and Northeast alfalfa states, prunes alfalfa roots, resulting in stunted, chlorotic plants and poor seedling establishment in wet soil conditions, and a persistent drain on established stands. Many alfalfa seed varieties are available with Race 1 resistance, fewer are available with Race 2 resistance, but the enhanced multi-race resistance isolate is very unique.

Anthracnose, a disease that effects stems and crowns occurs in more warm and humid conditions. Classic symptoms are liken to diamond shaped lesions on lower stems and the "shepherd's crook" wilting on the terminal parts of shoots. Like Aphanomyces, many alfalfa seed varieties are available with Race 1 resistance, but WL 349HQ comes fully loaded with high resistance to Anthracnose Race 5 as well.

Both of these diseases can cost growers via loss of yield at establishment or losses in-crop, so if these two diseases are prevalent in your geography, strong consideration should be made to realize the benefit of planting this impactful disease resistance package from W-L Alfalfas.



High-resistance Multi-Race Aphanomyces and Anthracnose resistance varieties (in the middle) compared to susceptible competitive check varieties (on outsides), Photo taken at FGI Research Facility, June 2018, West Salem, WI

HQ™

AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	4.4
Winterhardiness	1.7
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	40/40

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race 1)	HR
Anthracnose (Race 5) ²	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Aphanomyces Enhanced Multi-Race ¹	HR
Pea Aphid	HR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE

¹Includes 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.

²Includes race 1 protection, along with Anthracnose Race 5, which was recently confirmed by USDA's Agricultural Research Service.



WL 358LH

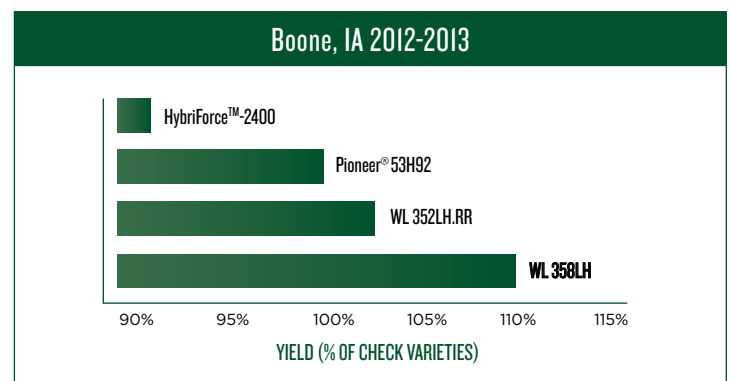
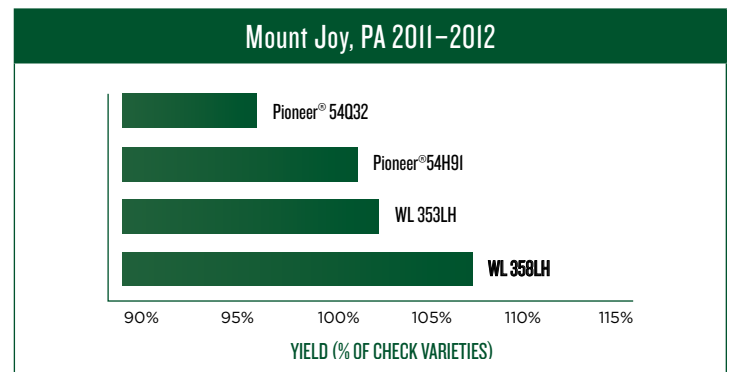
THE NEXT LEVEL OF ENHANCED POTATO LEAFHOPPER RESISTANCE

WL 358LH is the next level in the widely recognized line of HopperShield™ alfalfa genetics from W-L Alfalfas. Geared and selected for Midwest and Northeastern U.S. growers, WL 358LH is the latest in the line of varieties selected for 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.

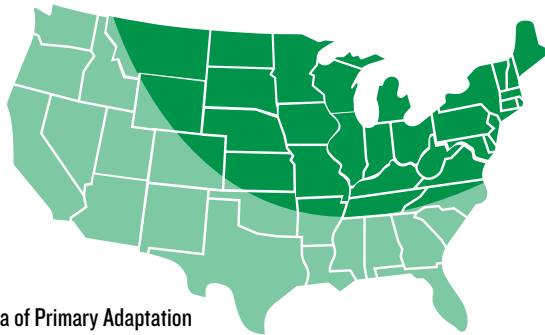
WL 358LH Advantages

- Eighth-generation potato leafhopper resistance, this HopperShield™ variety is a true “no-spray” PLH-resistant alfalfa
- 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
- An almost perfect 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 Outyields the Competition*



*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.



■ Area of Primary Adaptation

Treatment Thresholds for Potato Leafhoppers*

Spray thresholds from Iowa State University

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

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.



AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	4.1
Winterhardiness	2.0
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	34/35

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	R
Potato Leafhopper	HR
Pea Aphid	HR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 375HVX.RR

W-L ALFALFAS BULKS UP HARVXTRA® ALFALFA LINEUP WITH FD5 ADDITION

W-L HarvXtra® Alfalfa is a revolutionary new offering in alfalfa production

Our first fall dormancy 5 release, WL 375HVX.RR, simply delivers. WL 375HVX.RR compliments the 2016 release of FD4 WL 341HVX.RR and 2021 release of WL3471.HVXRR, offering another valuable winterhardy option with a new, advanced disease resistance package and the HarvXtra® Alfalfa trait.

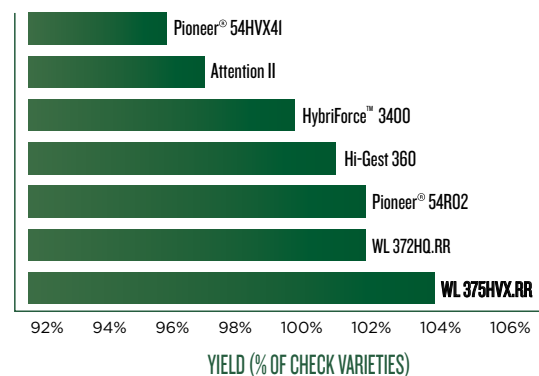
WL 375HVX.RR Advantages

- 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 WL 375HVX.RR a 16% greater RFQ (relative forage quality), and a 18% greater NDFD (neutral detergent fiber digestibility) than the average of competitive check varieties
- Yield performance of WL 375HVX.RR rivals WL 372HQ.RR, our highest yielding dormant variety ever, across 4 of our major U.S. research facilities
- Superb yield potential and agronomic characteristics under 4-cut system if delaying cutting frequency, or under 5- to 6-cut systems to maximize increased feed value
- Disease Resistance Index (39/40), which includes 'High Resistance' to Aphanomyces enhanced multi-race¹; and includes multi-race resistance to Anthracnose²
- 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

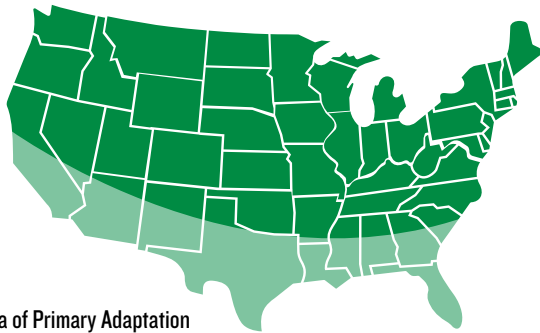
Planting WL 375HVX.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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 trifoliolate 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

WL 375HVX.RR Outyields the Competition* West Sale, WI; Mt. Joy, PA; Nampa, ID; Touchet, WA; 2016-2017



* 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.



■ Area of Primary Adaptation

WL 375HVX.RR is simply the new forage quality leader of FD5 Alfalfas*
Boone, IA; Mt. Joy, PA; West Salem, WI 2015-2016

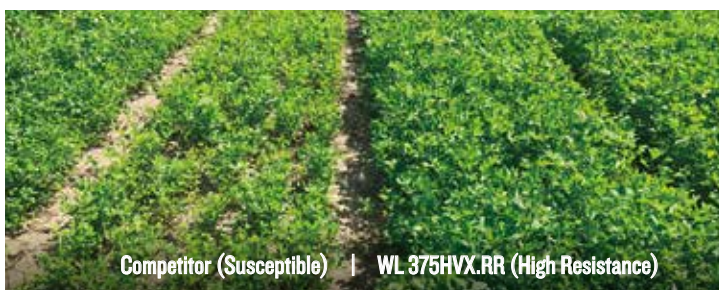
Variety	ADL	NDFD	RFQ
WL 375HVX.RR	78%	116%	118%
WL 372HQ.RR	102%	100%	100%
Hi-Gest 360	98%	103%	103%
HybriForce™ 3400	99%	102%	102%
Pioneer® 54R02	100%	98%	97%
Attention II	101%	98%	98%

ADL = Acid Detergent Lignin 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 Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.

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.



Competitor (Susceptible) | WL 375HVX.RR (High Resistance)

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

HARVXTRA
with Roundup Ready® Technology

AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	4.6
Winterhardiness	2.1
Digestibility/Feed Value	HarvXtra®
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Very High
Disease Resistance Index	39/40
Salt Tolerance	Germination

*HarvXtra® Alfalfa with Roundup Ready® Technology

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race 1)	HR
Anthracnose (Race 5) ²	R
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	HR
Aphanomyces Enhanced Multi-Race ¹	HR
Spotted Alfalfa Aphid	R
Pea Aphid	R
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE

¹Includes 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.

²Includes race 1 protection, along with Anthracnose Race 5, which was recently confirmed by USDA's Agricultural Research Service.



WL 372HQ.RR

EXCEPTIONAL TONNAGE AND FORAGE QUALITY UNDER INTENSIVE MANAGEMENT

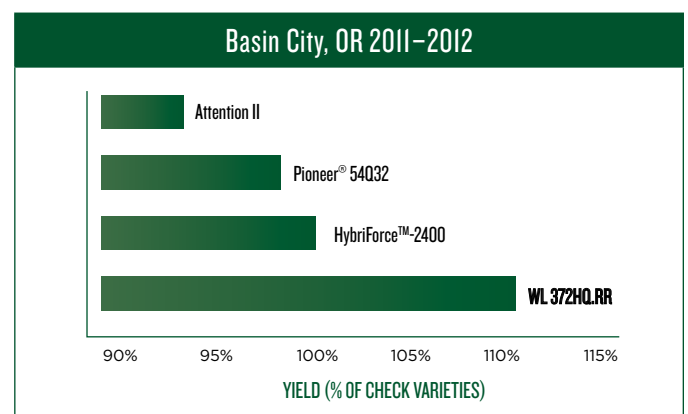
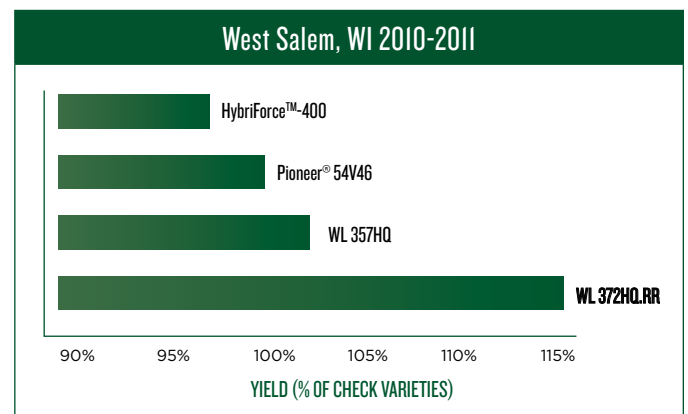
WL 372HQ.RR Delivers Outstanding Performance

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.

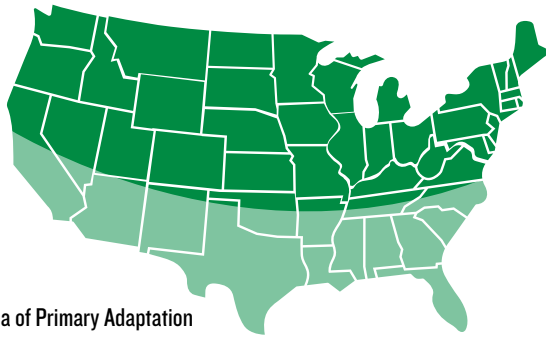
WL 372HQ.RR Advantages

- Our highest-yielding winterhardy RR FD5 released to date
- Very high yield potential under 4- to 6-cut harvest schedules
- 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 an almost perfect 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 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 372HQ.RR Outyields the Competition*



* 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.



■ Area of Primary Adaptation

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

HQ™

**Roundup
Ready®**
ALFALFA

AGRONOMIC TRAITS

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

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthraco nose (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	R
Spotted Alfalfa Aphid	HR
Pea Aphid	R
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 365HQ

THE NEW 5/2 HIGH-YIELD LEADER

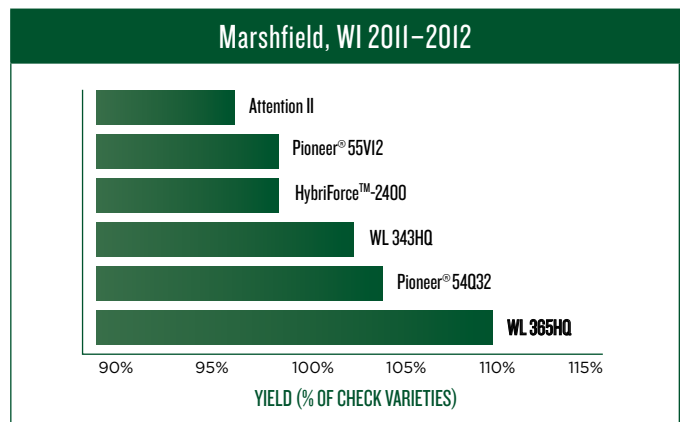
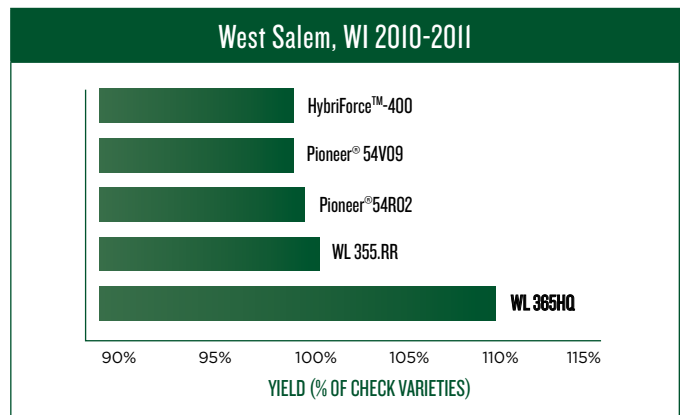
Our latest 5/2 winterhardy HQ variety

In 2002, W-L Alfalfas released its first 5/2 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 is the latest release in the line of high-yielding types packed with HQ levels of forage quality.

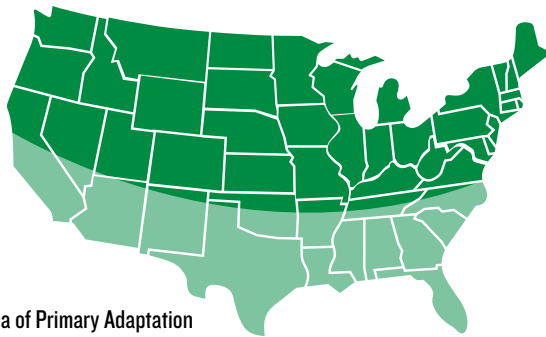
WL 365HQ Advantages

- Very high yield potential and agronomic performance under 4- to 6-cut harvest management systems (FD=4.9), and now our highest-yielding winterhardy conventional HQ released to date
- 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
- An almost perfect 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*

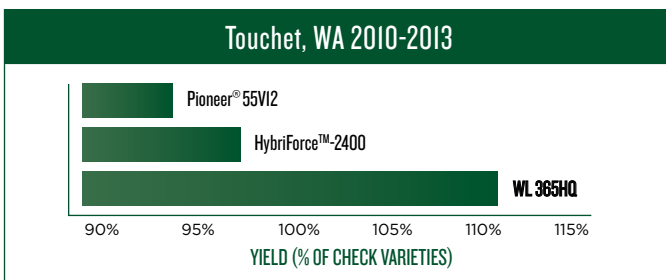
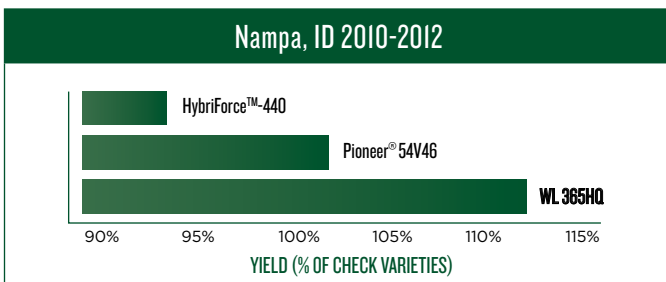
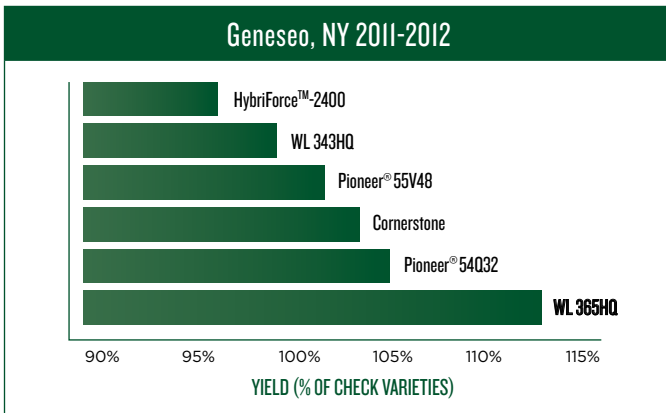


* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



■ Area of Primary Adaptation

WL 365HQ Outyields the Competition*



* 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.



AGRONOMIC TRAITS

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

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracoese (Race 1)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race 1)	HR
Aphanomyces Root Rot (Race 2)	R
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 377HQ

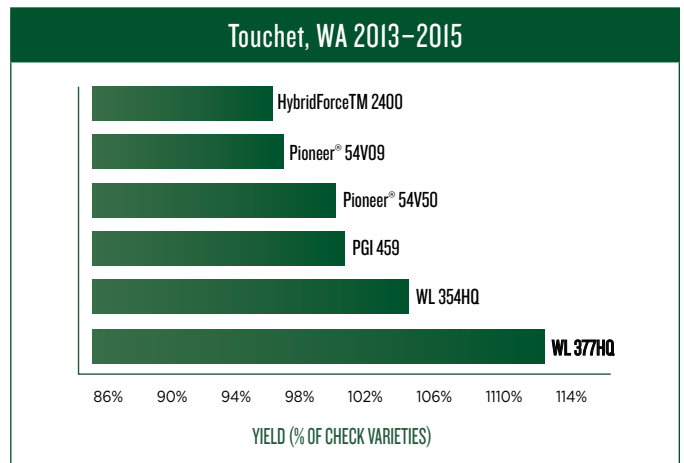
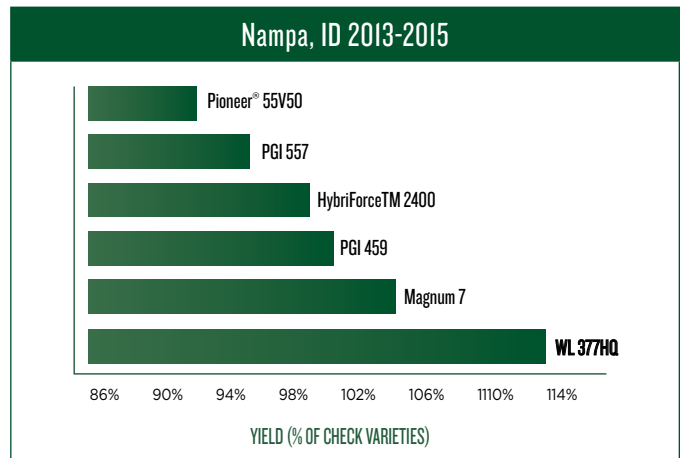
TOP OF OUR FD5 CLASS IN THE WEST

There have been many breakthrough varieties since the inception of W-L Alfalfas, 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.

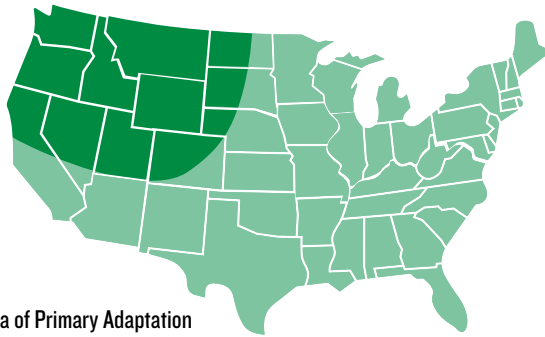
WL 377HQ Advantages

- Superb yield potential and agronomic performance under 4 to 6-cut harvest management systems (FD=5.0) in locations throughout the West
- 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
- Perfect 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*

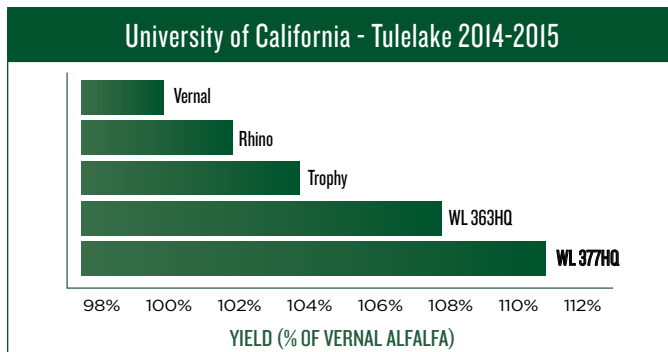
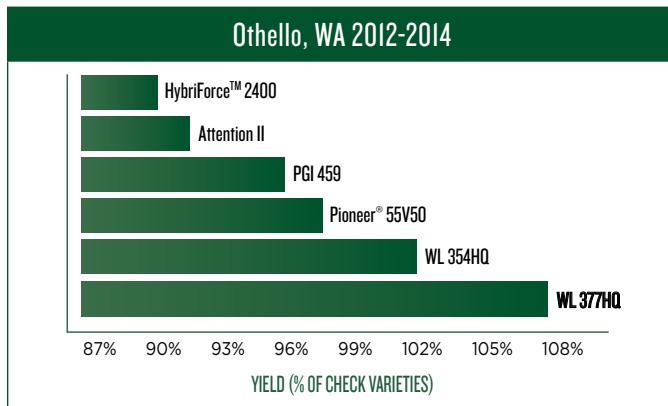


* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



■ Area of Primary Adaptation

WL 377HQ Outyields the Competition*



WL 377HQ Forage Quality Analysis*

Nampa, ID 2014

Variety	CP	NDFD	RFQ
WL 377HQ	21.2	44.4	174
WL 363HQ	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 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.



AGRONOMIC TRAITS

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

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race I)	HR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Stem Nematode	HR
Root-Knot Nematode (Northern)	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



HVX620RR Brand

ALFALFA REINVENTED

The New Standard of Yield Potential and Quality with W-L HarvXtra® Alfalfa

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.

HVX620RR 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:
 - Maintain their normal harvest schedule for higher-quality forage
 - Extend harvest for up to 10 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.

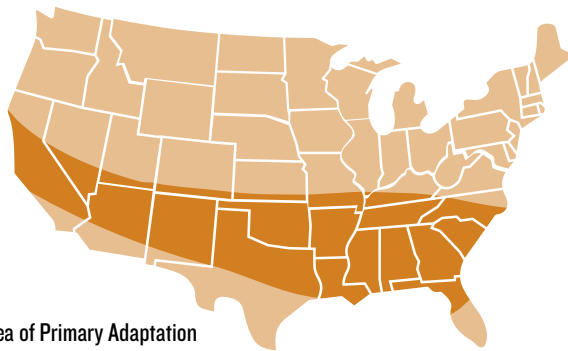
HVX620RR Brand Variety Performance

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

Variety	Fall Dormancy	Forage Yield (% Commercial Checks)			Forage Quality (% Commercial Checks)		
		Canyon, TX	Davis, CA	Los Banos, CA	I5 Canyon, TX	I5 Davis, CA	I5 Los Banos, CA
HVX620RR Brand	6	97	104	99	115	110	112
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

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.



■ Area of Primary Adaptation

Planting HVX620RR 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/Feed Value	HarvXtra®
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good

PEST RESISTANCE TRAITS

Bacterial Wilt	MR
Fusarium Wilt	HR
Anthracoese (Race I)	R
Phytophthora Root Rot	HR
Aphanomyces Root Rot (Race I)	R
Pea Aphid	HR
Spotted Alfalfa Aphid	HR
Blue Alfalfa Aphid	MR
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 458HQ.RR

EXCEPTIONAL YIELD POTENTIAL AND OUTSTANDING HAY QUALITY

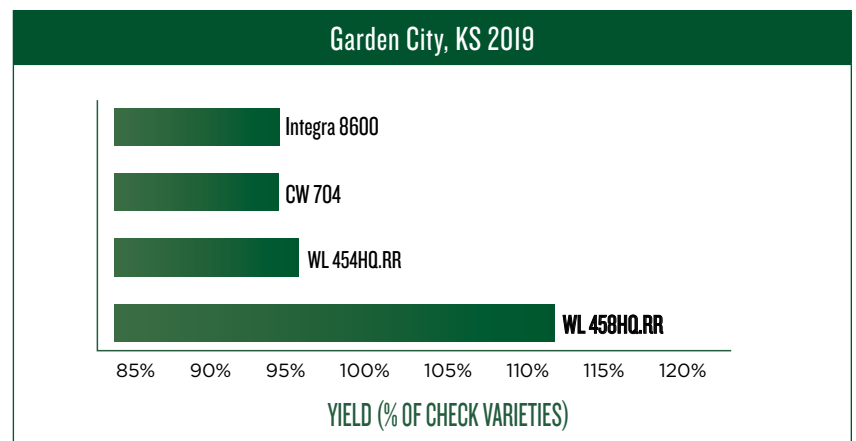
WL 458HQ.RR Advantages

- Semi-dormant FD=6
- Outstanding yield potential under 5-, 6-, and 7-cut harvest managements
- Resistant to all major aphid pests
- Resistant to all major nematode pests
- WL 458HQ.RR 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

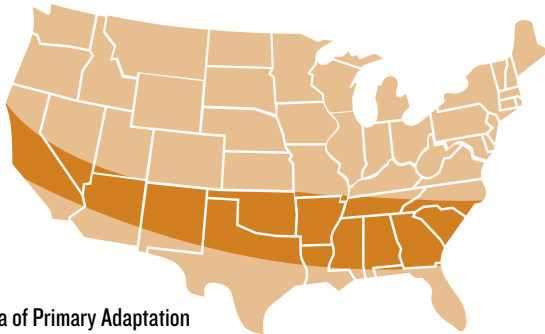
Planting WL 458HQ.RR Alfalfa and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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

WL 458HQ.RR Outyields the Competition*

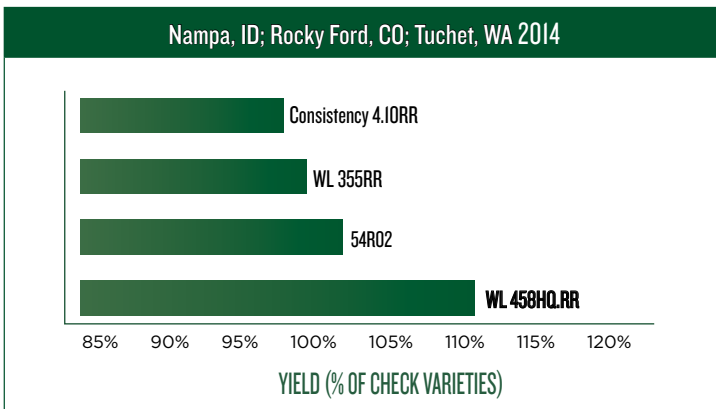


* Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfa's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



■ Area of Primary Adaptation

WL458HQ.RR: A Hay Quality Leader*



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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
Winter Activity	Moderate
Digestibility/Feed Value	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Moderate
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthraco nose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces (Race I)	HR
Spotted Alfalfa Aphid	R
Pea Aphid	HR
Blue Alfalfa Aphid	R
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 467HQ

CONSISTENT HIGH PERFORMER IN SEMI-DORMANT TERRITORY

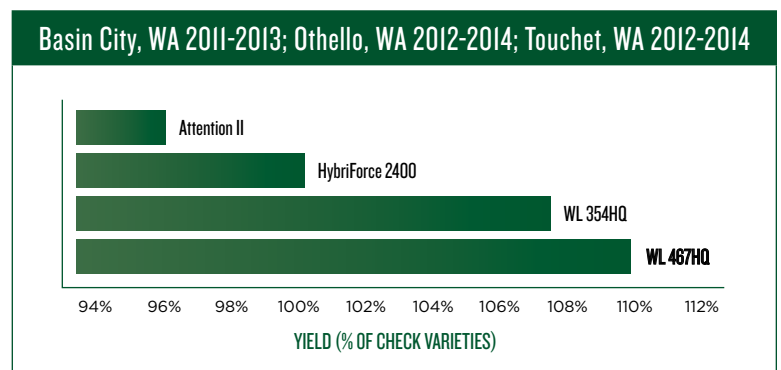
An intermediate HQ alfalfa to pay attention to

WL 467HQ compliments 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.

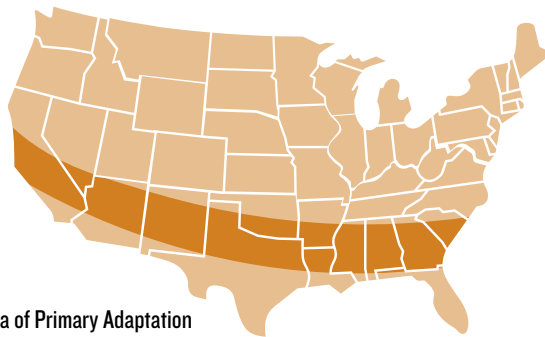
WL 467HQ Advantages

- Excellent yield potential and agronomic performance under 5 to 7-cut harvest management systems (FD=6.0)
- "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*

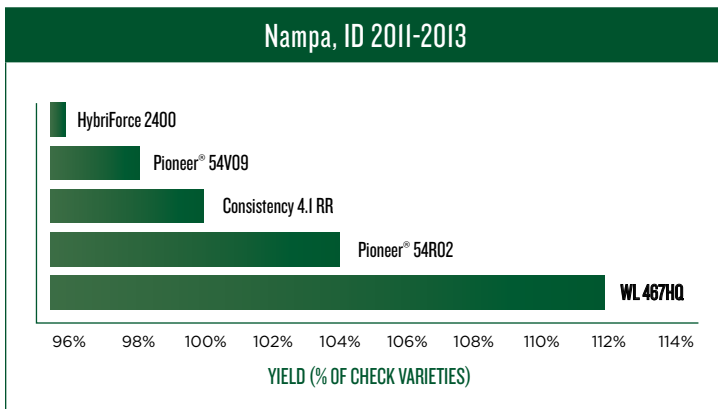


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■ Area of Primary Adaptation

WL 467HQ Outyields the Competition*



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AGRONOMIC TRAITS

Fall Dormancy	6.0
Winter Activity	Moderate
Digestibility/Feed Value	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Multileaf Expression	Moderate

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	R
Anthracnose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces (Race I)	R
Spotted Alfalfa Aphid	R
Pea Aphid	HR
Stem Nematode	HR
Root-Knot Nematode (Northern)	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



HVX840RR Brand

W-L ALFALFAS FIRST NON-DORMANT RELEASE OF HARVXTRA®, A GAME CHANGER FOR THE SOUTHWEST

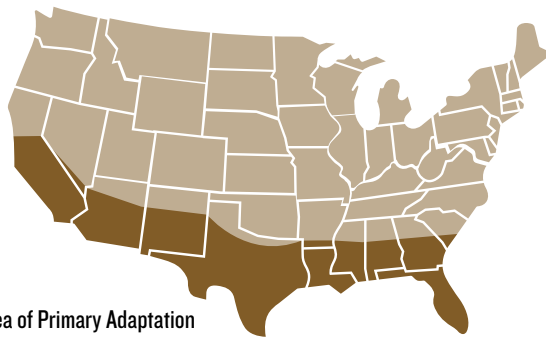
HVX840RR Brand, the latest release in the W-L HarvXtra® lineup offers exciting harvest flexibility accomplished by reduced lignin content

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® technology provides unprecedented flexibility by widening cutting windows, which gives growers the option at each cutting to:
 - Maintain their normal harvest schedules for higher-quality forage, or
 - 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

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 trifoliolate 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



HVX840RR Brand Outyields the Competition*

Shafter, CA 2014-2016

Variety	Forage Yield (% Commercial Check)	Forage Quality (% Commercial Check)
HVX840RR	104	114
WL 552.RR	100	102
AmeriStand 855T RR	99	100
RRALF 8R100	84	100

Dos Palos CA 2014-2016

Variety	Forage Yield (% Commercial Check)	Forage Quality (% Commercial Check)
WL HVX840RR	104	108
WL 552.RR	100	101
AmeriStand 855T RR	96	101
RRALF 8R100	—	—

Davis, CA 2014-2016

Variety	Forage Yield (% Commercial Check)	Forage Quality (% Commercial Check)
WL HVX840RR	105	108
WL 552.RR	—	101
AmeriStand 855T RR	102	98
RRALF 8R100	92	99

* 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

AGRONOMIC TRAITS

Fall Dormancy	8.2
Winter Activity	High
Digestibility/Feed Value	HarvXtra®
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	R
Fusarium Wilt	HR
Anthracnose (Race I)	R
Phytophthora Root Rot	R
Spotted Alfalfa Aphid	R
Pea Aphid	HR
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 558HQ.RR

INCREDIBLE YIELD POTENTIAL BACKED BY SUPERB FORAGE QUALITY

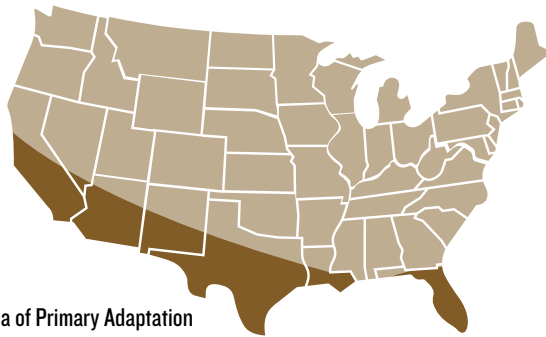
WL 558HQ.RR results from five years of intense forward breeding from WL 552HQ.RR with the focus on additional high yield potential, persistence, forage quality and increased pest resistance.

WL 558HQ.RR Advantages

- WL 558HQ.RR is a 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

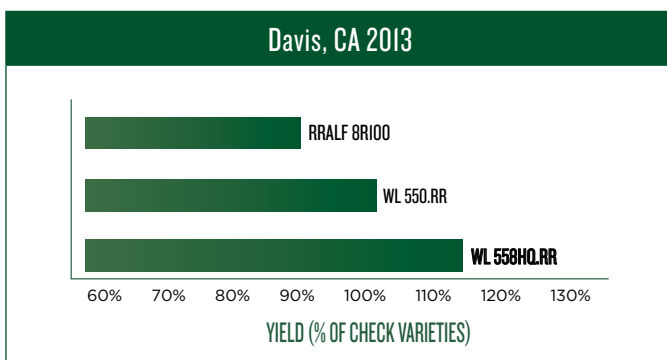
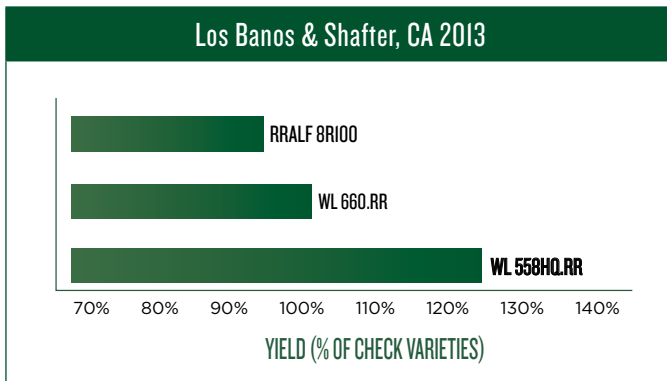
Planting WL 558HQ.RR and Utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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



■ Area of Primary Adaptation

WL 558HQ.RR Excels Against the Competition*



* 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.



AGRONOMIC TRAITS

Fall Dormancy	8.0
Winter Activity	High
Digestibility/Feed Value	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	R
Anthracnose (Race I)	R
Phytophthora Root Rot	HR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Blue Alfalfa Aphid	R
Stem Nematode	R

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 538HQ

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

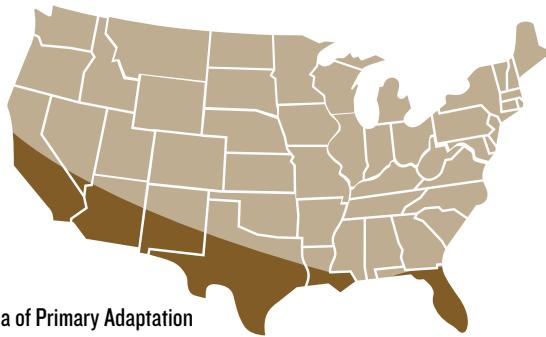
- Winter-active, non-dormant FD=8.0
- Very high yield potential across a wide range of soil types and harvest schedules
- Highly resistant to all major aphid pests
- Resistant to all major nematode pests
- WL 538HQ is highly palatable; optimizes intake, milk production, and can help lower feed costs 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

Davis, CA 2015-2017	
Variety	Yield (T/A)
WL 538HQ	113
HybriForce 800	99
CW 704	95

Los Banos, CA 2015-2017	
Variety	Yield (T/A)
WL 538HQ	115
HybriForce 800	99
CW 704	96

Davis, CA 2018-2020	
Variety	Yield (T/A)
WL 538HQ	109
Magna 80IFQ	102
HybriForce 800	98

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.



■ Area of Primary Adaptation

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.

HQ™

AGRONOMIC TRAITS

Fall Dormancy	8.0
Winter Activity	High
Digestibility/Feed Value	Superior
Persistence Index	Excellent
Recovery After Harvest	Fast
Standability	Excellent
Traffic Tolerance	Very Good
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	R
Fusarium Wilt	HR
Verticillium Wilt	R
Anthracnose (Race I)	HR
Phytophthora Root Rot	HR
Aphanomyces (Race I)	MR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Blue Alfalfa Aphid	HR
Stem Nematode	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 668HQ.RR

YIELD PACKED POTENTIAL BACKED BY SUPERB FORAGE QUALITY

Our latest FD9 release, 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.

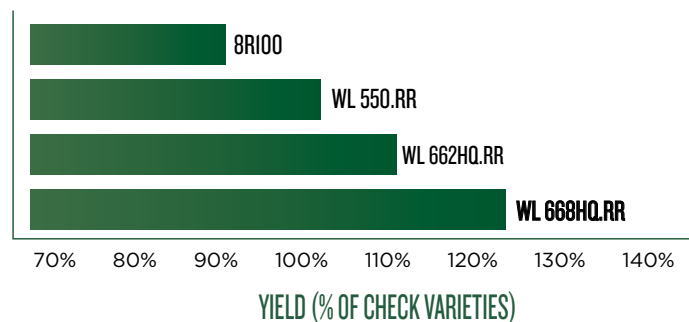
WL 668HQ.RR Advantages

- Winter-active, non-dormant FD=9.3
- Very high yield potential under 8- to 11-cut harvest systems
- 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

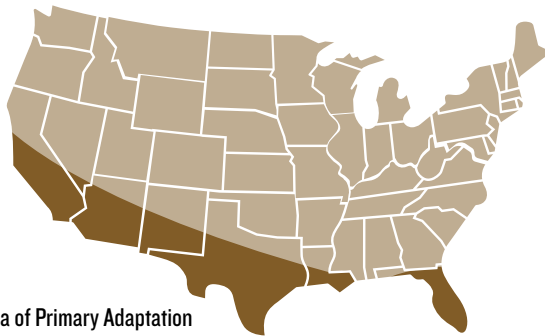
Planting WL 668HQ.RR utilizing the Roundup Ready® weed control system provides many benefits over conventional herbicide programs

- 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 trifoliolate 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

WL 668HQ.RR Outyields the Competition* 2013-2015 Davis, CA

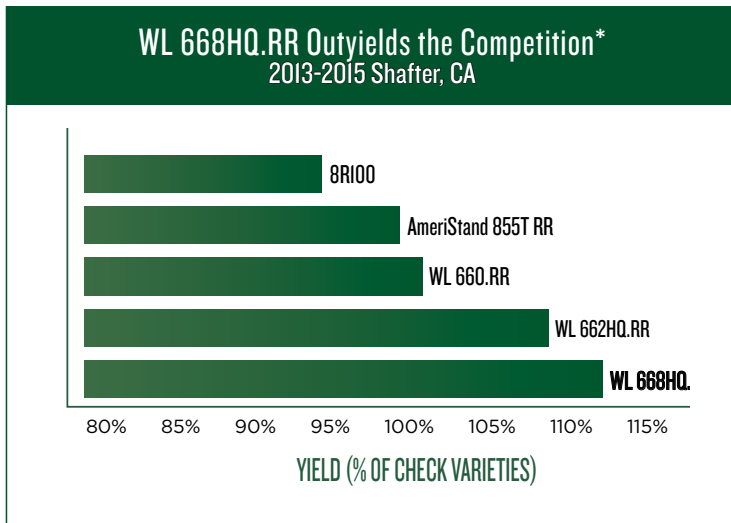


*Results are based on controlled field trials at the listed W-L Alfalfas location. Results may vary and are dependent on factors outside of W-L Alfalfas's control, such as weather. Yield, profit and other results cannot be predicted or guaranteed by W-L Alfalfas.



■ Area of Primary Adaptation

WL 668HQ.RR Outyields the Competition*



*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.



AGRONOMIC TRAITS

Maturity	Early
Fall Dormancy	9.3
Winterhardiness	Very High
Digestibility/Feed Value	Superior
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	HR
Fusarium Wilt	HR
Verticillium Wilt	R
Anthracnose (Racel)	HR
Phytophthora Root Rot	HR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Blue Alfalfa Aphid	R
Stem Nematode	HR
Root-Knot Nematode (Northern)	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



WL 656HQ

THE BEST 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
- Optimal digestibility supports more milk and greater 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

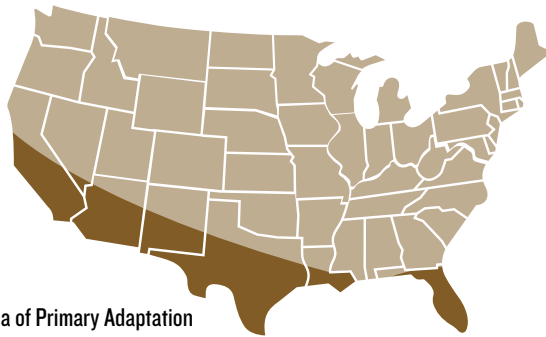
Shafter, CA 2006-2008 (25 cuts)	
Variety	Yield (T/A)
WL 656HQ	34.6
WL 625HQ	32.1
AmeriStand 802	32.0
WL 711	30.6
Cuf 101	30.5
Pioneer® 59N49	30.1
Pioneer® 58N57	29.1

Holtville, CA 2008-2009 (19 cuts)	
Variety	Yield (T/A)
WL 656HQ	17.7
TriplePlay	15.9
S&W 9301	15.5
WL 625HQ	15.2
Magna 901	14.8
Pioneer® 59N49	14.8
CW 907	14.7
Sequoia	13.5

Univ. of California, Kearney 2009 (7 cuts)	
Variety	Yield (T/A)
WL 656HQ	12.1
Saltana	11.7
WL 625HQ	11.3
Magna 995	10.9
UC Impalo	10.6
CUF 101	9.9
Dura 843	9.2
Pioneer® 59N49	9.0

Shafter, CA 2006-2008 (16 cuts)	
Variety	Yield (T/A)
WL 656HQ	19.3
WL 625HQ	17.8
Cuf 101	18.2
Pioneer® 59N49	17.7
Magna 801FQ	16.8
CW 907	16.0
S&W 9720	15.7
Dura 843	15.6

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.



■ Area of Primary Adaptation

WL 656HQ: The One To Beat!

Our newest, 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.

WL 656HQ: An HQ Leader*

Shafter, California, 2006-2008

Variety	CP	RFQ
WL 656HQ	22.9	179
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 RFV = Relative Feed Value

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HQ™

AGRONOMIC TRAITS

Fall Dormancy	9.3
Digestibility/Feed Value	Superior
Persistence Index	Very High
Recovery After Harvest	Very Fast
Standability	Excellent
Traffic Tolerance	Very Good
Salt Tolerance	Germination

PEST RESISTANCE TRAITS

Bacterial Wilt	MR
Fusarium Wilt	HR
Verticillium Wilt	HR
Anthracnose (Race I)	R
Phytophthora Root Rot	HR
Spotted Alfalfa Aphid	HR
Pea Aphid	HR
Blue Aphid	HR
Stem Nematode	HR
Root-Knot Nematode (Southern)	HR

HR = HIGH RESISTANCE R = RESISTANT MR = MODERATE RESISTANCE



AGRONOMIC TRAITS

	Fall Dormancy	Winterhardiness	Digestibility/Feed Value	Wet Soil Tolerance	Multileaf Expression	Bacterial Wilt	Fusarium Wilt	Verticillium Wilt
DORMANT								
WL 336HQ.RR	3.2	1.0	Excellent	—	High	HR	HR	HR
WL 319HQ	2.8	1.3	Excellent	—	Very High	HR	HR	HR
WL 341HVX.RR	4.0	2.1	HarvXtra®	—	Very High	HR	HR	HR
WL 3471.HVXRR	4.3	1.9	HarvXtra®	—	Very High	HR	HR	HR
WL 356HQ.RR	3.8	1.6	Superior	Excellent	Very High	HR	HR	HR
WL 344I.RR	4.3	2.0	Superior	—	Very High	HR	HR	HR
WL 359LH.RR	3.9	2.2	Superior	—	High	HR	HR	HR
WL 354HQ	3.9	1.4	Superior	Excellent	Very High	HR	HR	HR
WL 349HQ	4.4	1.7	Superior	Excellent	Very High	HR	HR	HR
WL 358LH	4.1	2.0	Superior	—	Very High	HR	HR	HR
WL 375HVX.RR	4.6	2.1	HarvXtra®	Excellent	Very High	HR	HR	HR
WL 372HQ.RR	4.9	1.8	Superior	—	Very High	HR	HR	HR
WL 365HQ	4.9	1.1	Superior	—	Very High	HR	HR	HR
WL 377HQ	5.0	2.5	Superior	—	Very High	HR	HR	HR
SEMI-DORMANT								
HVX620RR Brand	6.0	—	HarvXtra®	—	—	MR	HR	—
WL 458HQ.RR	6.0	—	Superior	—	Moderate	HR	HR	HR
WL 467HQ	6.0	—	Superior	—	Moderate	HR	HR	R
WL 454HQ.RR	6.7	—	Superior	—	Moderate	R	HR	R
NON-DORMANT								
HVX840RR Brand	8.2	—	HarvXtra®	—	—	R	HR	—
WL 558HQ.RR	8.0	—	Superior	—	—	HR	HR	R
WL 538HQ	8.0	—	Superior	—	—	R	HR	R
WL 535HQ	8.2	—	Superior	—	—	—	HR	HR
WL 668HQ.RR	9.3	—	Superior	—	—	HR	HR	R
WL 656HQ	9.3	—	Superior	—	—	MR	HR	HR

PEST RESISTANCE TRAITS

TRAITS

Anthracnose (Race 1)	Anthracnose (Race 5) ²	Phytophthora Root Rot	Aphanomyces (Race 1)	Aphanomyces (Race 2)	Aphanomyces Enhanced Multi-Race ¹	Spotted Alfalfa Aphid	Pea Aphid	Stem Nematode	Southern Root-Knot Nematode	Northern Root-Knot Nematode	Potato Leafhopper	Disease Resistance Index	Salt Tolerance
HR	—	HR	HR	R	—	R	HR	MR	—	—	—	34/35	G
HR	—	HR	HR	—	—	R	R	MR	—	—	—	30/30	—
HR	—	HR	HR	R	—	HR	R	R	—	—	—	34/35	G
HR	R	HR	HR	HR	HR	—	R	R	—	—	—	39/40	—
HR	—	HR	HR	HR	—	MR	R	HR	—	—	—	35/35	G
HR	—	HR	HR	HR	R	—	R	HR	—	—	—	35/35	G
HR	—	HR	HR	R	—	R	R	R	—	—	HR	34/35	—
HR	—	HR	HR	HR	—	HR	HR	R	—	—	—	35/35	G
HR	HR	HR	HR	HR	HR	—	HR	R	—	—	—	40/40	—
HR	—	HR	HR	R	—	—	HR	R	—	—	HR	34/35	—
HR	R	HR	HR	HR	HR	R	R	HR	—	—	—	39/40	G
HR	—	HR	HR	R	—	HR	R	HR	—	—	—	34/35	G
HR	—	HR	HR	R	—	HR	HR	R	—	—	—	34/35	G
HR	—	HR	HR	—	—	HR	HR	HR	—	HR	—	30/30	G

R	—	HR	R	—	—	HR	HR	R	—	—	—	—	—
HR	—	HR	HR	—	—	R	HR	HR	—	—	—	—	G
HR	—	HR	R	—	—	R	HR	HR	—	HR	—	—	—
HR	—	HR	—	—	—	R	HR	HR	—	R	—	—	G

R	—	R	—	—	—	R	HR	HR	—	—	—	—	G
R	—	HR	—	—	—	HR	HR	R	—	—	—	—	G
HR	—	HR	MR	—	—	HR	HR	HR	—	—	—	—	G
—	—	HR	—	—	—	HR	HR	R	R	R	—	—	G
HR	—	HR	—	—	—	HR	HR	HR	—	HR	—	—	—
R	—	HR	—	—	—	HR	HR	HR	HR	—	—	—	G

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

SALT TOLERANCE

G = Germination
F = Forage

¹Includes 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.

²Includes race 1 protection, along with Anthracnose Race 5, which was recently confirmed by USDA's Agricultural Research Service.

STANDARD SEED TREATMENT PACKAGE OFFERINGS

Treatment Options	Treatment Description	Stamina®	Apron XL®	Nitragin Gold®	Optimize Gold®	Micronutrients	OMRI Listed
34% Nutrient Coat	COS	X	X	X	X	X	NO
Apex Green 34% Organic Coat (Only available on specific products)	OC			X			YES

ADVANTAGES OF GOLD® TREATMENT PLUS

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

Proprietary Gold® Treatment Plus Package includes:

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.

Nitragin® Gold

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

Apron XL® Fungicide

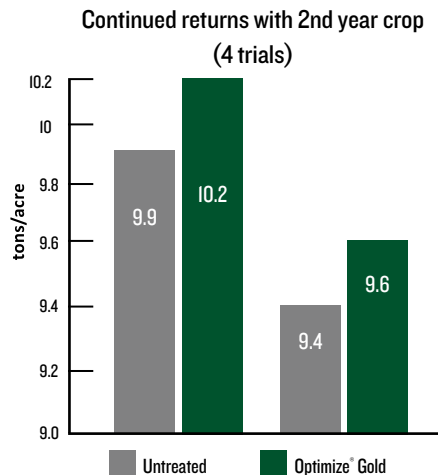
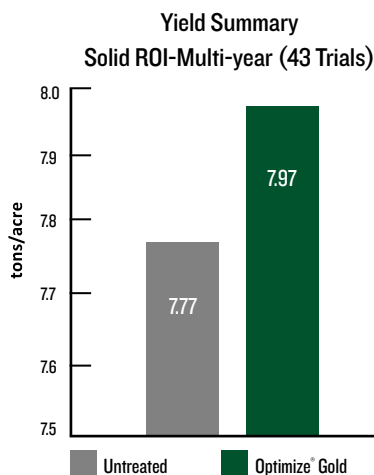
- Protects against seedling damping-off diseases, especially in cool wet soils

Micronutrients

- Assists in early vigor and stand establishment

Protective Coating

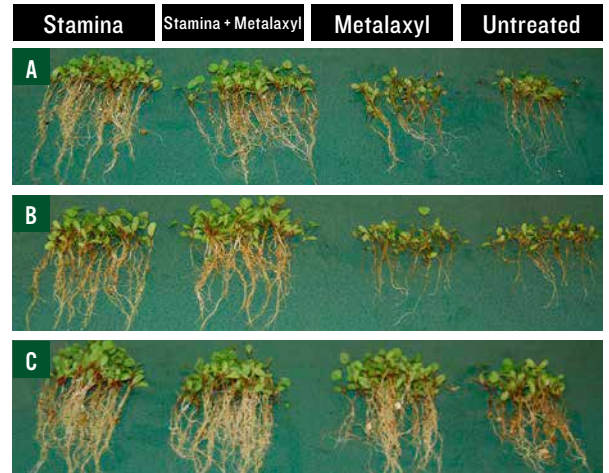
- Preserves and extends shelf life of active rhizobia within seed treatment



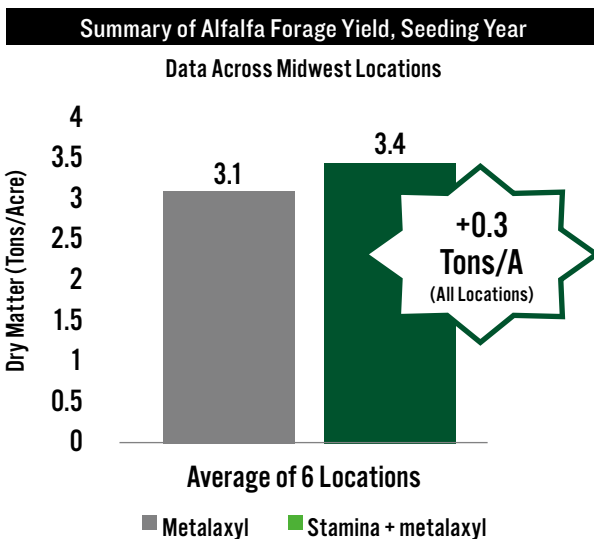
STAMINA® FUNGICIDE BENEFITS

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.



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.

AN ALFALFA THAT GIVES YOU OPTIONS. NOT LIMITS.

The genetically enhanced HarvXtra® 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 341HVX.RR, WL 375HVX.RR, HVX620RR 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.

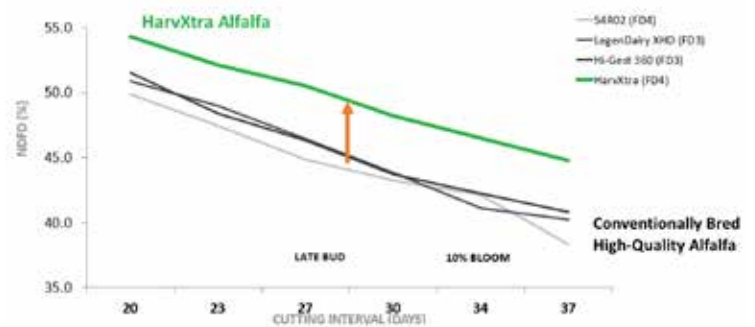
- Choose to maintain your current harvest schedule for higher quality forage, OR
- Delay harvest a few days for increased tonnage without sacrificing acceptable forage quality.

It's a True Game Changer

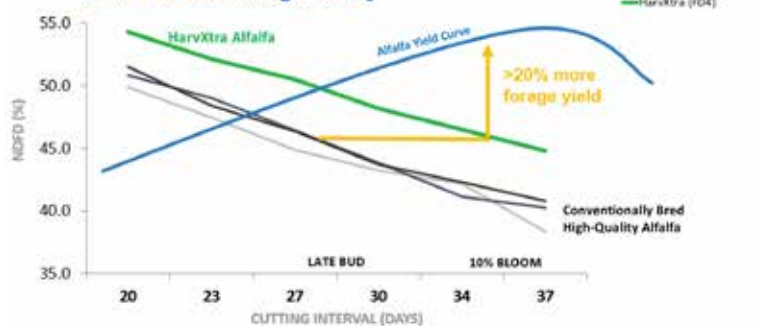
By reducing the amount of lignin in the plant, the HarvXtra® Alfalfa trait technology fundamentally changes the relationship between forage quality and stage of maturity. Less acid detergent lignin (ADL) and higher neutral detergent fiber digestibility (NDFD) improves digestibility and can command a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

To learn more about HarvXtra® with Roundup Ready® technology, visit harvxtra.com.

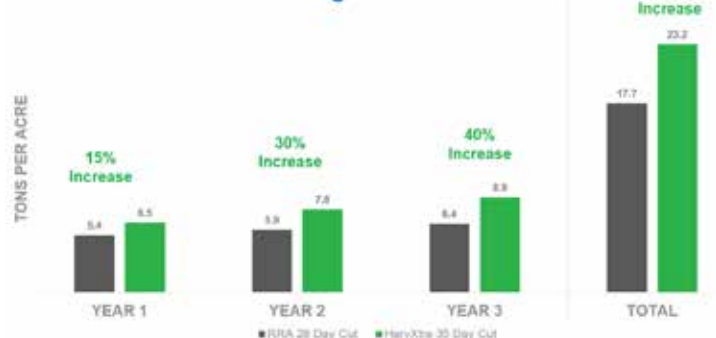
HarvXtra® Alfalfa Delivers Exceptional Forage Quality



Extend Harvest for Increased Yield Potential, without Sacrificing Quality



Extend Harvest for Higher Yield Potential





EXPERIENCE THE 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.

DECREASED DAMAGE FROM HERBICIDES

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

CLEANER STAND ESTABLISHMENT

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

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 PERSISTENCE POTENTIAL

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



MORE QUALITY POTENTIAL

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



MORE SAVINGS POTENTIAL

Enjoy lower herbicide costs compared to conventional herbicide options.



Learn more at RoundupReadyAlfalfa.com.



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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.

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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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