

DDRR

Farming Dossier



ddrr
VIVA GRAN

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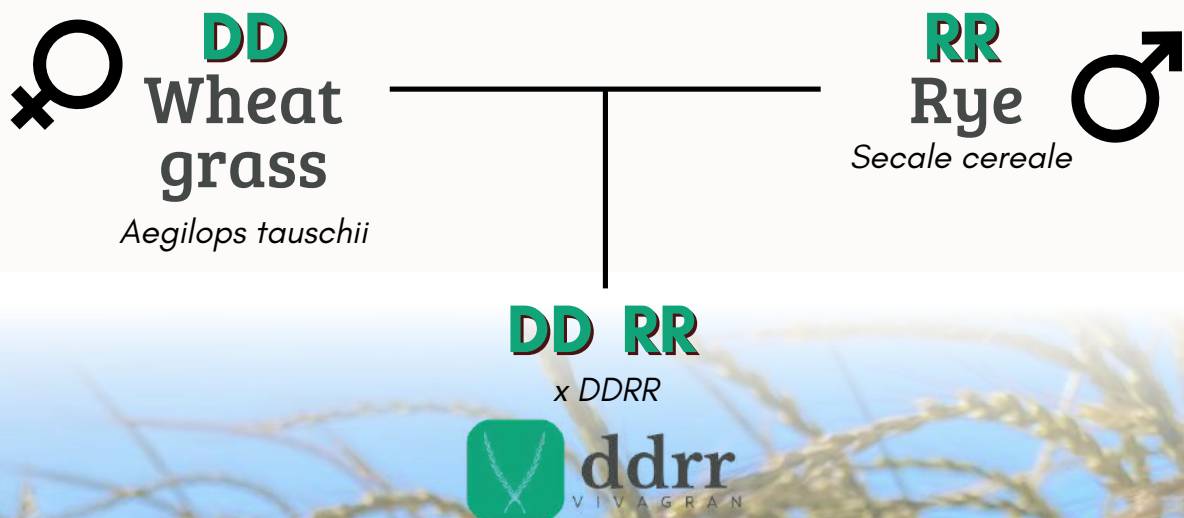
DDRR

the tetraploid cereal

DDRR is a novel cereal resulting from the hybridization of **wild wheat grass** (*Aegilops tauschii*) and **rye** (*Secale cereale*).

Developed through traditional breeding methods, it combines desirable traits from both parents, offering enhanced nutritional value and adaptability to various environmental conditions.

Notably, DDRR is **non-GMO** and holds promise for sustainable agriculture.



Phenotype

A unique new phenotype

DDRR's phenotype reflects its unique hybrid origin, combining key traits from rye and wild wheat grass. Agronomically, it displays a **robust and semi-erect growth habit**, with **broad, deep-green leaves** and loose, slightly **bearded spikes**.

The **DDRR spike** is like no other in the cereal world.

Here's a precise description:



Type:

- **Unilateral**, determinate spike, meaning it stops growing after the terminal spikelet forms.

Spikelets per spike:

- **Typically 20 to 26 spikelets** per spike, arranged alternately along the rachis (central axis).

Spikelet arrangement:

- **One-rowed structure**: One fertile spikelet is present per rachis node on opposite sides.
- Spikelets are sessile (attached directly without pedicels) and alternate on the rachis.

Florets per spikelet:

- **Each spikelet contains 2 to 3 florets**, though usually only 1 to 2 develop into fully formed grains under field conditions.

Awns:

- **Short awns** (bristles) are common and vary in length depending on the cultivar (e.g., Alameda).
- Awns are straight to slightly curved and contribute to ear photosynthesis.

Color:

- **The spike often shows a golden to slightly purple color at maturity.**

Shape:

- **Generally thin**, loose, long (20-25cm), resembling no other cereal crop.

Phenotype

A unique new phenotype

DDRR is a vigorous crop that **produces early high amount of above-ground biomass**, with favorable protein yield and a fatty-acid profile that benefits from earlier cutting, making it well-suited for grazing and forage/silage applications.

Unlike uniform wheat fields, DDRR displays **spikes emerging at slightly different heights, reaching up to 200 cm**, contributing to a more irregular but dense canopy. This growth pattern reflects its wild wheat heritage and supports its adaptability to diverse environments, while also enabling efficient light capture and resilience under stress conditions.

DDRR is distinguished by its **excellent regrowth capability allowing several cuts per season** and produces early biomass with very high protein content and digestibility.



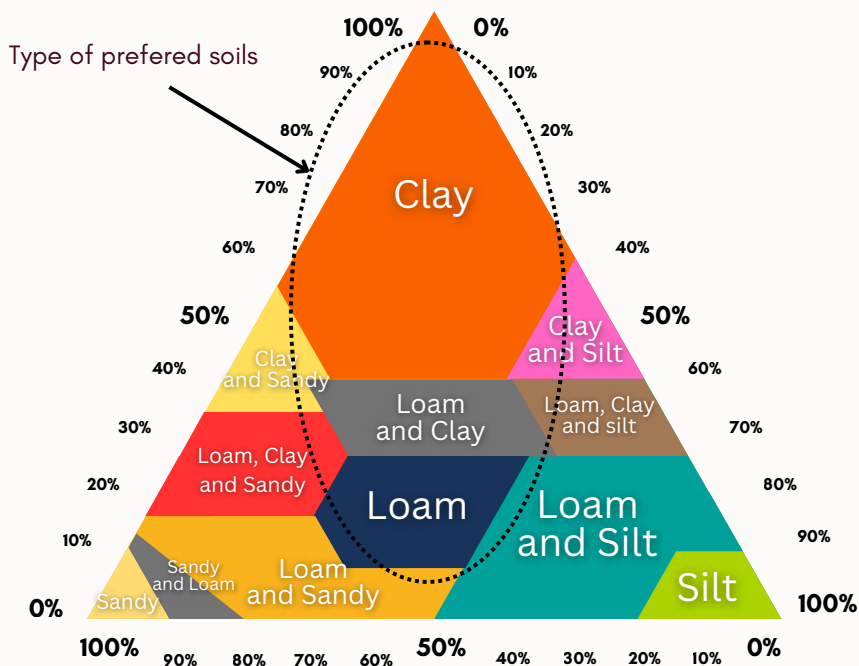
Agronomic Profile

Adaptability in soil, terrain, climate

DDRR was developed in the Mediterranean region, specifically in the south of Spain (Córdoba). Its origins in this climate shaped its **adaptation to hot, dry conditions with irregular rainfall**—traits typical of durum wheat growing regions. As a result, DDRR thrives in environments characterized by mild winters, early springs, and terminal drought, showing strong performance where other cereals may struggle.

Soil and Terrain

DDRR prefers well-drained soils with a **neutral to slightly alkaline pH**. It obtains its highest productions in Calcisols and Vertisols type of soils, although its adaptation is extensive like most of the wheats.



Feature	Calcisol	Vertisol
Key Trait	Lime accumulation (CaCO ₃)	Expanding clay, deep cracks
Climate	Arid to semi-arid	Seasonal wet-dry cycles
Texture	Loamy to clayey	Very clayey
Fertility	Moderate to high	High, but hard to manage
pH	Alkaline	Neutral to alkaline



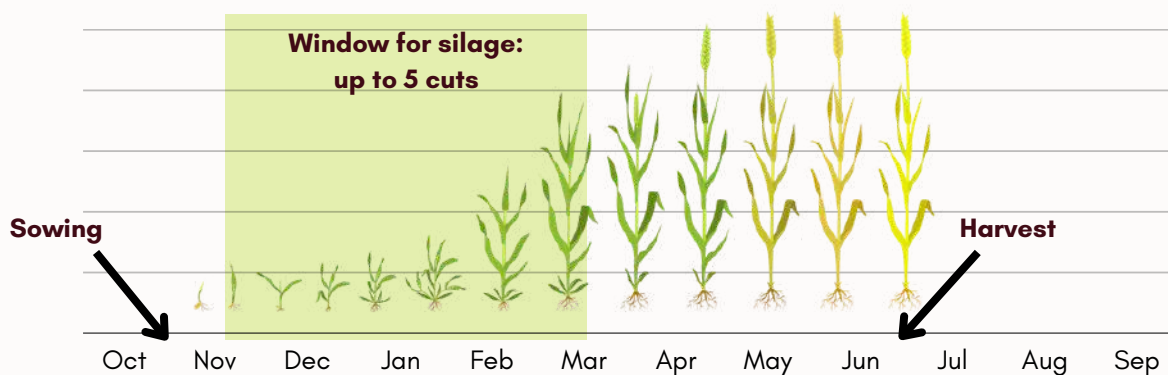
Agronomic Profile

Adaptability in soil, terrain, climate

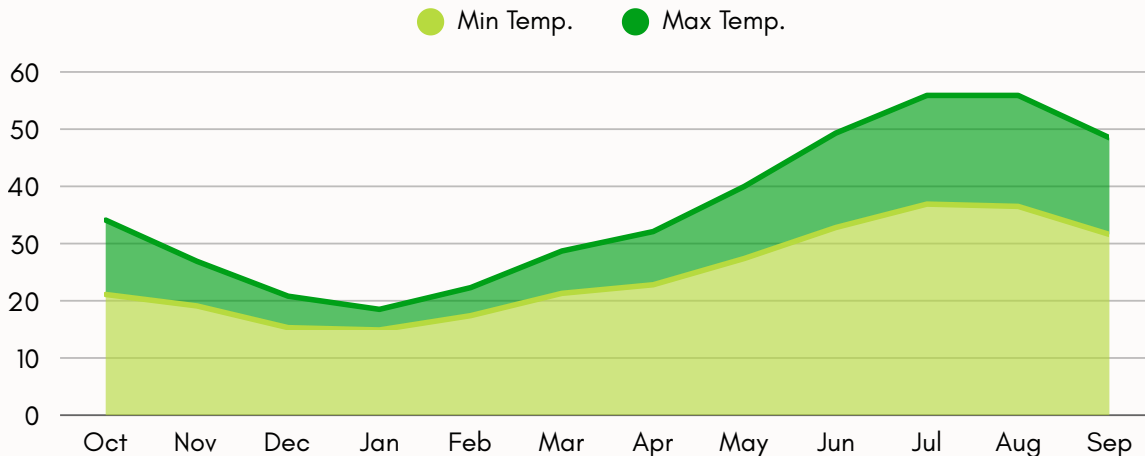
Climatic conditions

DDRR's commercial varieties were bred and selected in Córdoba, Spain.

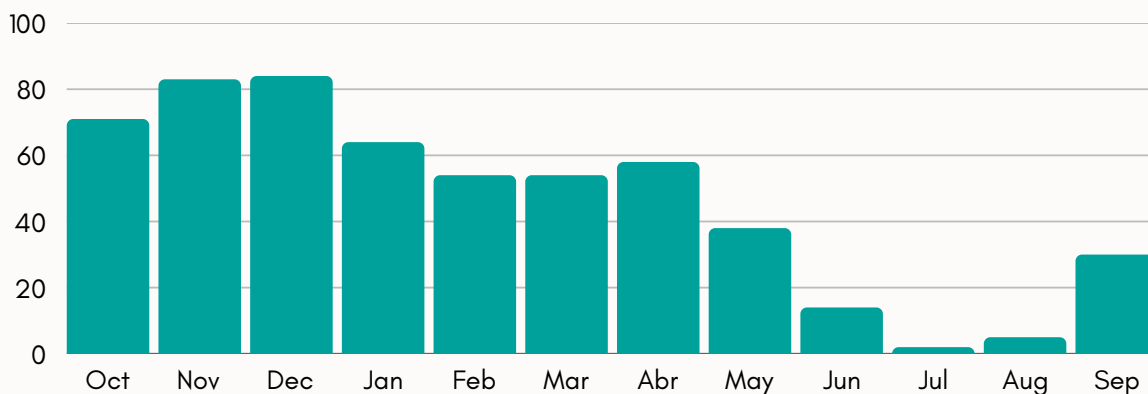
DDRR growing cycle:



Min and Max temperatures in celcius in Córdoba, Spain:



Average rainfall in mm in Córdoba, Spain:

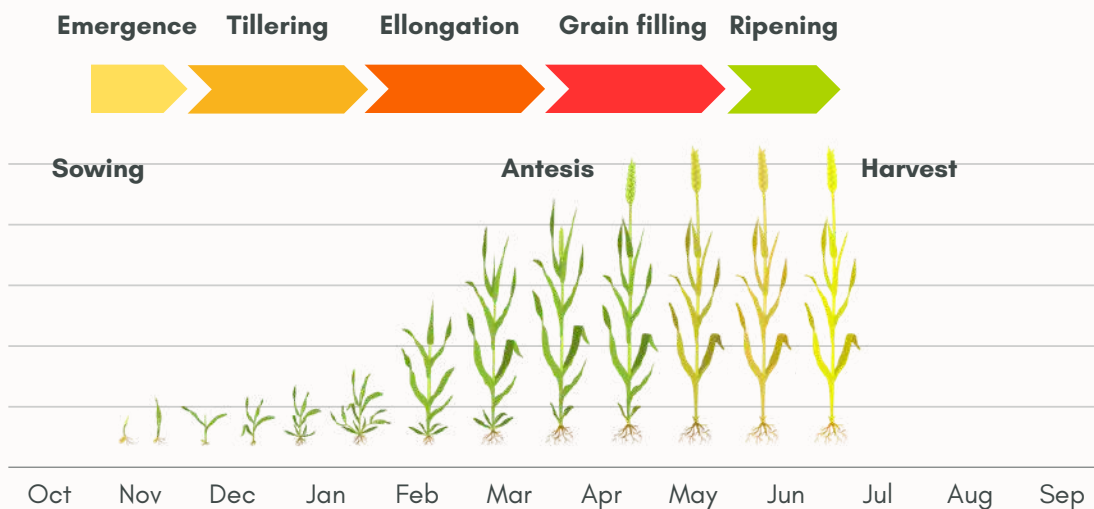


Agronomic Profile

Adaptability in soil, terrain, climate

Other characteristics

DDRR growing cycle:



Winter sowing window: 15th Oct. to 15th Nov.
Spring sowing window: 15th Feb. to 15th Mar.

DDRR is an alternative crop species, which does not require a strict vernalization

Sowing density for seed production: 50 to 70 kg /hectare
Sowing density for silage production: 70 to 100 kg /hectare

Higher sowing densities to those recommended may result in lower yields

Row Spacing and Depth: Rows spaced at 15–20 cm with a sowing depth of 3–5 cm are optimal for uniform emergence.

The tillering capability of DDRR is better than other feed crops.

Time to antesis: 125 to 135 days

Typical harvest window: June and July

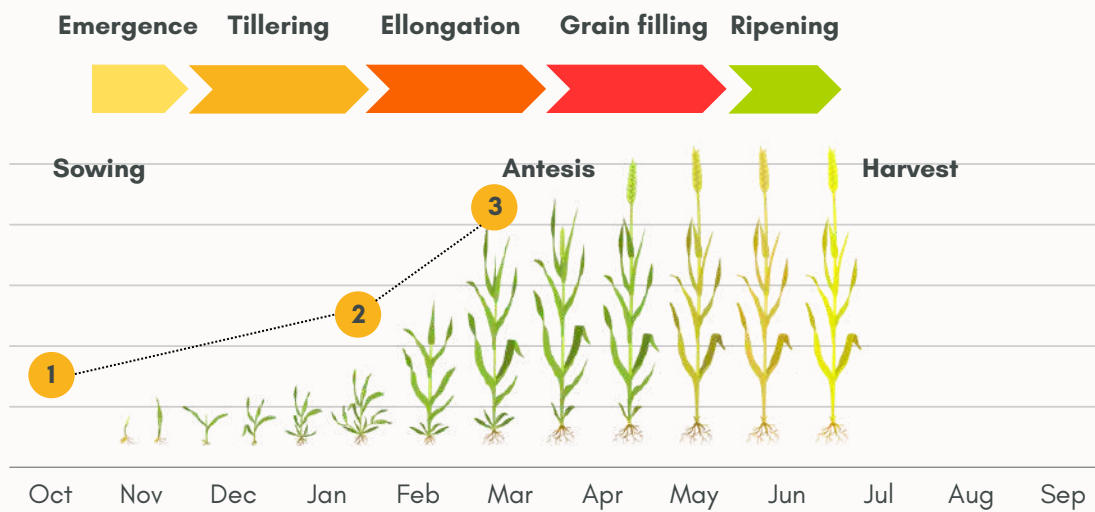


Agronomic Profile

Crop management

Fertilization

DDRR growing cycle:



1	Background application:	20%
2	End of tillering:	60%
3	Before heading:	20%
		100%

Given that the NPK extraction per ton of harvest is approximately 30-15-20, a **3,5 ton/ha Dry Matter (DM) yield** with +20% Crude protein content, and a **2,5-3,5 ton/ha grain yield** would require 150 Nitrogen Units (UN), 75 Phosphorus Units (UP), and 100 Potassium Units (UK).



Agronomic Profile

Crop management

Water Management

DDRR is noted for its water-use efficiency, performing well under rainfed conditions in suitable climates. In areas with prolonged dry spells, supplemental irrigation during critical growth stages (e.g., flowering and grain filling) can enhance yields. Its drought tolerance reduces the need for extensive irrigation, conserving water resources.

Crop Protection

DDRR demonstrates resistance to several common cereal diseases, including rusts and septoria. However, regular field monitoring is essential to detect and manage potential pest infestations or disease outbreaks promptly.

Crop protections used are typically those in use for winter wheats/barleys. Vivagran performs regularly trials to test new formulas to ensure that we see no phyto-toxicity, and can recommend what brands/products to use to farmers. In the following sections, we present the seed treatments, herbicides, fungicides, insecticides tested and recommended for DDRR.

Seed Treatments

Commercial Name	Dosis (g or l /ha)	Active Material	Suitable for...
PREMIS (BASF)	100-200 cc/Qm	triticonazol-2,5 p/v FS	Conventional farming
RAXIL PLUS (BAYER)	80-150 cc/Qm - 10-15 ml/100 kg	tebuconazol-2,5 p/v FS	Conventional farming
VITAVAX Flow (UPL Ltd.)	250-450 cc/Qm	carboxina-20 + tiram-20	Conventional farming
VINCIT MINIMA (FMC)	150-250 mL/Qm	flutriafol 2,5 p/v	Conventional farming
KINTO PLUS (BASF)	120-150 ml/100 kg	33,3 g/l de fludioxonil, 33,3 g/l de fluxapiraxad y 33,3 g/l de triticonazol	Conventional farming
MAS RAIZ ECO (SERVELASA)	1,5 L/ 1000 kg	see spec	Organic farming
PRE-SEM (SERVELASA)	2 - 2,5L/ 1000kg	see spec	Organic farming

Agronomic Profile

Crop management

Crop Protection

The effectiveness of the treatment is scored from 0 to 5.
5 = very effective / 0 = ineffective

Wide Leaf Herbicides

Commercial Name	Dosis (g or l /ha)	Authorized in...	Absorbed by...	Active Material							
					Thistle	Lagina Florida	Fumaria	Lapa	Daisy flower	Poppy flower	Speedwell flower
GRANSTAR 50 SX (DUPONT)	22,5-37,5 g	Durum, Rye	Root, Leaf	tribenuron-50	3	5	2	2	3	5	1
TRIMMER (DUPONT)	10-25 g	Durum, Rye, Oat	Root, Leaf	tribenuron-75	3	5	2	2	3	5	1
GRANSTAR SUPER (DUPONT)	40-60 g	Durum, Rye	Root, Leaf	tifensulfuron-25 + tribenuron-25	3	5	3	2	3	5	3
HARMONY 50 SX (DUPONT)	45-75 g	Durum, Rye, Oat	Root, Leaf	tifensulfuron-50	0	5	3	2	3	4	3
POSTA SX (BAYER)	45-67,5 g	Durum, Rye	Root, Leaf	tifensulfuron-33,3 + tribenuron-16,7	3	5	3	2	3	5	3
BIATHLON 4D (BASF)	100-150 g	Wheat, Barley, Rye, Triticale	Leaf	tritosulfuron 50 + florasulam 5	3	4	3	2	3	4	3
RACING TF (NUFARM)	50-75 g	Durum, Rye	Root, Leaf	metsulfuron-7 + tifensulfuron-68	4	5	5	3	5	5	3

Narrow Leaf Herbicides

Commercial Name	Dosis (g or l /ha)	Authorized in...	Absorbed by...	Active Material						
					Crazy oat	Fox tail	Bromo	Raygrass	Bird seed	Vulpia
AUROS (SYNGENTA)	4-6 l	Durum, Rye	Root	prosulfofocarb-80	1	3	0	5	1	1
AXIAL (SYNGENTA)	0,5-0,6 l	Durum, Rye	Leaf	pinoxaden-10	5	5	0	4	5	0
TRAXOS (SYNGENTA)	0,15-0,3 l	Durum	Leaf	clodinafop-propargil-24+pinoxaden-10	5	5	0	3	5	0
TOPIK (SYNGENTA)	0,175 l	Durum	Leaf	clodinafop-propargil-24	5	5	0	4	3	0

Agronomic Profile

Crop management

Crop Protection

Fungicides

The effectiveness of the treatment is scored from 0 to 5.

5 = very effective / 0 = ineffective



Commercial Name	Dosis (g or l /ha)	Authorized in...	Deadline...	Active Material	Fusarium	Helminthosporium	Mildew	Ramularia	Rhynchosporium	Brown Rust	Yellow Rust	Septoria	Tapesia
VARIOS	0,8 - 1	Barley, Wheat	35 days	azoxistrobin 25		3	1		1	5	5	3	
AZOSHY	1	Oat, Barley, Rye, Wheat, Triticale		azoxistrobin 25		3			1	5	5	3	1
TRIUNFO MAX	1	Barley, Wheat	35 days	azoxistrobin 20 + tebuconazol 20	3	3			2	5	5	3	
AVIATOR XPRO	0,6-1 / 0,8-1,25	Oat, Barley, Wheat, Triticale		bixafen 7,5 + prothioconazol 15	4	5	4		5	5	5	5	
SAKURA	1,2	Wheat	55 days	bromuconazol 16,7 + tebuconazol 10,7	3					5	5	3	
CYFLAMID	0,5	All cereals	60 days	ciflufenamid 5,13			5						
IMTRES	2	Oat, Barley, Rye, Wheat, Triticale	35 days	fluxapiraxad 6,25		5	1	5	5	4		5	4
LIBRAX	2	Barley, Wheat, Triticale	35 days	fluxapiraxad 6,25 + metconazol 4,5	4	5	2		5	5		5	
PRIAXOR EC	1 - 1,5	Oat, Barley, Rye, Wheat, Triticale	35 days	fluxapiraxad 7,5 + piraclostrobin 15		5	3	5	5	5	5	5	
CARAMBA EC	1	Oat, Barley, Wheat	35 days	metconazol 9	4		2		4	5	4	4	
FLEXITY	0,5	Oat, Barley, Wheat, Triticale	35 days	metrafenona 30			5						4
COMET 200 & MODEM 1,1	1,1	Oat, Barley, Rye, Wheat, Triticale	35 days	piraclostrobin 20		3			4	5	5		
CABRIO	1	Barley, Wheat	42 days	piraclostrobin 25		3	1		4	5	5	2	
VARIOS	1	Barley, Wheat		procloraz 45	1	1	1		3			3	3
ELATUS ERA LR/ ELATUS ERA	0,5 - 1	Oat, Barley, Rye, Wheat, Triticale		prothioconazol 15 + benzovindiflupyr 7,5		5		5	5	5	5	5	
PROSARO & ABILIS	1	Oat, Barley, Rye, Wheat, Triticale	35 days	prothioconazol 12,5 + tebuconazol 12,5	4	5	4		5	5	5	5	
SPARTA, LICTOR E	1,25	Oat, Barley, Rye, Wheat, Triticale		tebuconazol 20		4	4			5	5	3	
SONG	1	Oat, Barley, Rye, Wheat, Triticale	35 days	tebuconazol 25		4	4			5	5	3	
ULYSSES	0,6	Oat, Barley, Rye, Wheat, Triticale	35 days	tebuconazol 45	3	4	4		2	5	5	3	
BUZZ ULTRA DF	0,33	Wheat	35 days	tebuconazol 75			4			5	5	3	

Resistance of DDRR

Diseases	Level of Resistance
Fusarium	Moderate
Helminthosporium	Moderate
Mildew	High
Ramularia	Moderate
Rhynchosporium	Moderate
Brown Rust	High
Yellow Rust	High
Septoria	High
Tapesia	Moderate



Agronomic Profile

Crop management

Crop Protection

Others



Foot rot / Take-all

Field observations and trials indicate that DDDR exhibits tolerance to foot rot pathogens, especially under Mediterranean conditions where drought and poor soil structure can exacerbate symptoms in wheat.



Black stem rust

DDRR shows moderate to good tolerance to black rust (stem rust), though it is not completely immune.



Ergot

DDRR shows good tolerance, typically like rye, under similar conditions.

Insecticides



Commercial Name	Dosis (g or l /ha)	Active Material	Tick	Aphids	Calamobius	Beetles	Moths
DELTA PLAN (BAYER)	0,03-0,05 %	DELTAMETRIN 2,5% ((ESP I)) [EC] P/V	yes	yes			
AUDACE (CHEMINOVA AGRO)	0,03-0,05 %	DELTAMETRIN 2,5% ((ESP I)) [EC] P/V	yes	yes			
DECIS EXPERT (BAYER)	0,0625 l /ha	DELTAMETRIN 10% [EC] P/V		yes	yes	yes	
DECIS EC 100 (BAYER)	0,0625 l /ha	DELTAMETRIN 10% [EC] P/V		yes	yes	yes	
DECIS (BAYER)	0,03-0,05 %	DELTAMETRIN 2,5% ((ESP I)) [EC] P/V	yes	yes			
RITMUS (PROBELTE)	0,03-0,05 %	DELTAMETRIN 2,5% [EC] P/V (ESP.)		yes		yes	
DELTA EC (SAPEC AGRO)	0,3-0,5 l/ha	DELTAMETRIN 2,5% [EC] P/V		yes			yes
KILSEC (SYNGENTA)	0,1%	PIRIMICARB 50% [WG] P/P					

Agronomic Profile

Crop management

Guidelines for Harvesting DDDR grain

Harvesting DDDR requires careful attention to timing, combine settings, and threshing efficiency to ensure optimal grain quality and minimal losses. DDDR has its own unique characteristics that demand specific adjustments.

Optimal timing

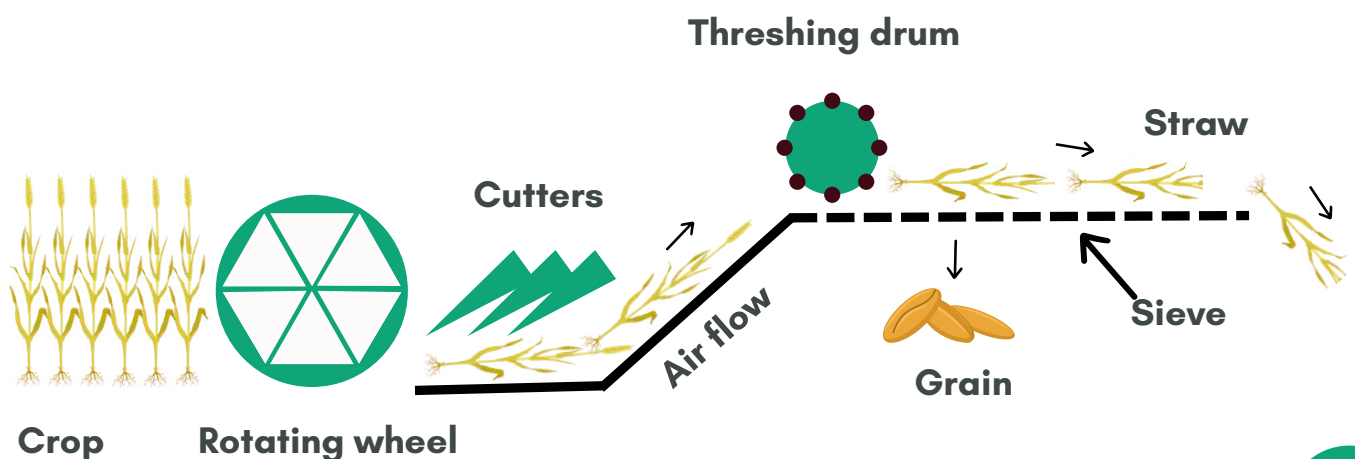
- Begin harvesting when the crop is dry, ideally in the afternoon, when morning dew has evaporated.
- **Target grain moisture should be below 12%.** The ideal range is 9-11%, as lower moisture improves threshing efficiency and grain separation.

Combine settings and calibration

- Proper calibration of the combine is crucial. In comparison to bread wheat:
 - **Adjust height of cutters**
 - **Slower air-flow**
 - **Check for sieve: should be 1,6-1,8mm maximum.**

Threshing characteristics

- **DDRR glumes are tougher than wheat**, which makes threshing easier at lower moisture levels.
- Threshing is generally more difficult than bread wheat, and closer to rye or triticale, depending on the DDDR variety.
- If harvesting starts too early or with improper settings, expect poor threshing or spike/grain breakage.



Agronomic Profile

Yield and resistance

Yields expectations

Forage

DDRR is excellent in regrowth ability with up to 5 cuts for forage.

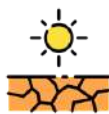
Biomass yield ranges from 23 to 53 tons per hectare, with cuts from December to April, at a 1-month interval. While biomass yield increases, the protein content decreases from 21% to 10% in the final cut.

Grain

Rainfed conditions: Expected yield ranges from 2.5 to 3.5 tons per hectare.

Irrigated conditions: never tested under such conditions.

Resistance to abiotic stresses



Drought/Heat resistance

- Maintains ear photosynthesis





Cold resistance

- Good cold and frost resistance, for temperatures above -10°C

Grain characteristics

Morphology

Morphology

	DDRR	Rye	Raygrass	Oat
Scientific name	x DDRR	Secale cereale	Lolium multiflorum Lolium perenne	Avena sativa
Genome	DDRR Tetraploid 28 chromosomes	RR Diploid 14 chromosomes	AABBDD Diploid 14 chromosomes	AACCDD Hexaploid 42 chromosomes
Cycle	Winter	Winter and Spring varieties	Winter and Spring varieties	Winter and Spring varieties
Hull	No	No	Yes	Yes
Awns	Yes	Both Typical has awns	No	No
Spikelets count	22-26	15-25	12-24	20-30
Grain shape	Elongated	slightly elongated	Very elongated and thin	slightly elongated
Grain color	Amber	Greenish	light tan to brown color	light yellow to golden brown
	 Variety: Alameda			

Grain characteristics

Applications

Morphology

1000 kernels weight: 22-33 gr

Specific weight: 68-72 kg/hL

Typical sieve mesh for cleaning: 1,6 mm

Aspect: can be vitreous or mealy



Applications

Forage



Fast regrowth



High biomass potential



Nitrogen use efficiency

Silage



Excellent Feed values



High protein and digestibility



High appetite

Biogas



High biomass potential



High methane yield



Adaptable to process

Summary

- A unique new phenotype
- Likes Calsisol and Vertisol soils
- Adapted to Mediterranean-like climate
- No seed dormancy
- No vernalization requirement
- Winter-sown gives higher yields
- 100 UN nitrogen is enough

- Crop protection management like wheats, barleys
- Excellent resistance to rusts, septoria, mildew
- Excellent biomass, regrowth potential and nutrition
- Harvester needs adjustments: tighter cutters, slower airflow, sieve 1,6mm
- Good resistance to abiotic stresses: heat, drought, cold.

- Elongated, amber, smaller than wheat
- Multiple uses: forage, biogas



More at: www.2d2r.com





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