Crop & Service Guide

2023 - 24

A BRAND OF MAÏSADOUR

masseeds®

ACT TOGETHER FOR A CHANGING AGRICULTURE

Dear grower,

Climate change and environmental degradation are an existential threat to all of us, on every continent. At the same time consumers are asking for a more sustainable approach to agriculture. This translates into a lower use of crop protection products, and fertilizers, and more attention to soil quality and biodiversity. As one of the major seed actors in Europe, it makes sense to have a close look at the **EU GREEN DEAL** though.

The Green Deal is a set of policy initiatives aiming to overcome the challenge of climate change and make our food systems more sustainable. Among them, there is the Farm to Fork strategy, which aims to **reduce**, by 2030, the overall **use and risk of chemical pesticides by 50%**, reduce nutrient losses while conserving soil fertility, so therefore reduce the use of fertilisers by at least 20%. And finally, the EU Commission also wants to arrive at a **quarter of the EU's agricultural land under organic farming**.

All this have major impacts on Europe's, and also the world's plant breeding and seed sector. We at MAS Seeds® are already very well advanced with our company purpose ACT TOGETHER FOR A CHANGING AGRICULTURE, in contributing to this transition. MAS Seeds® proposes various agroecological solutions to face those 4 key challenges:

1. **Carbon & Soil Fertility,** adapted cultural practices can help reach a positive carbon balance, protect soil life and increase soil fertility,
2. **Protein & Energy Autonomy,** Producing protein locally on farm is an important part of food sovereignty. Together with renewable energy production it makes an important pillar of agroecology,
3. **Water & Climate Resilience,** Growing crops in water scarcity requires adapted farming systems enhanced by genetic tolerance.
4. **Biodiversity,** landscape design with pollinators and using genetic tolerance is an efficient measure to reduce chemical inputs.

In concrete, we provide an innovative **diversified seed portfolio, genetic innovations for changing climate, seed applied solutions, agro-services** that support the EU policies.

Furthermore, we are implementing a Corporate Social Responsibility (CSR) Policy that is 100% aligned with our company purpose. Our **R&D division** has restructured their organization, added an "Agroecological solutions" department and started implementing experiments for future solutions. We are working on **partnerships with universities** that will bring us even further in agroecological transition.

It is safe to say that MAS Seeds® will continue contributing to the agroecological transition to the maximum degree possible, as we are convinced it is the right way to go. The three pillars provide a solid foundation for each of our customers, no matter the country. **Let's ACT TOGETHER for a Changing Agriculture!**

Francois HARAMBAT
Head of Marketing & Sustainable Agriculture

AFNOR Certification attests having assessed the contribution to sustainable development according to ISO 26000 within GROUPE COOPERATIF MAISADOUR.

Content

ACT TOGETHER FOR A CHANGING AGRICULTURE

Our mission

At MAS Seeds®, our mission is to **PROVIDE AN INNOVATIVE MAIZE & SUNFLOWER PORTFOLIO FOR CEREAL AND CATTLE GROWERS.**

We develop and produce high performing maize and sunflower varieties, and provide a diversified crop portfolio, seed applied solutions and agro-services that contribute to sustainable agriculture.

AN INNOVATIVE MAIZE & SUNFLOWER PORTFOLIO

We created genetics innovations to help our customers to improve their production and face an increasingly difficult climatic and economic environment.

WATER LOCK

GREEN+

HelioSMART

NORUST

Our purpose

Our purpose is **ACT TOGETHER FOR A CHANGING AGRICULTURE.**

Since 1949, we team up with farmers, distributors and partners to respond to agricultural challenges and contribute to the changing agriculture that will feed the future generations.

Furthermore, we are implementing a **Corporate Social Responsibility** (CSR) **Policy** and we received the **Responsibility Europe and CSR confirmed labels** in 2022.

A SUSTAINABLE PORTFOLIO FOR DIVERSIFICATION & REGENERATIVE AGRICULTURE

We develop an attractive portfolio for crop rotation, soil fertility & feed protein autonomy.

MAIZE | SUNFLOWER | ALFALFA | COVER CROPS | SOYBEAN | OILSEED RAPE | FORAGE MIXTURES | CEREALS

Soil Fertility & Carbon

Soil is the most essential non-renewable resource for crop production, and it plays a central role in biodiversity, carbon fixation and storage. At MAS Seeds® we support farmers to implement protective measures:

- Providing a complete cover crops portfolio to generate carbon sinks and improve soil fertilliy
- Helping field producers to optimize crop operations with AGROPLUS® services

Protein & Energy Autonomy

Increasing protein and feed autonomy is a way to reduce the negative impacts on the environment, manage economic and climatic risks thus improve the sustainability of the farms. We supports farmers to improve feed efficiency of their forages, from sowing to storage in silos by:

- Developing high energy and high protein species, varieties and mixtures as silage maize GREEN+, special alfalfa varieties and MAS4 Nutri
- Proposing NUTRIPLUS® Services to cultivate, harvest and store the forages in the best efficient way

Climate & Water Resilience

The biggest agricultural challenge of the future will be to increase food production while facing water scarcity. We started our agroecological transition by providing several agronomic solutions:

- Breeding resilient genetics against drought as GREEN+ and WATERLOCK for maize
- Selecting adaptable varieties with earlier relative maturity
- Developing a tropical germplasm to improve our temperate maize

Biodiversity

Biodiversity in agroecosystems offers a greater autonomy from synthetic fertilizers and crop protection products to the farmers, thanks to the interactions between plants and soil:

- Diversify crops to develop pollinators and increase the landscape biodiversity with alfalfa, cover crops, soybean, winter oilseed rape, sorghum and forage mixtures
- Develop high genetic tolerance against diseases like HelioSMART and NORUST for sunflower to reduce chemical inputs

AN AGRO-SERVICES PORTFOLIO TO SUPPORT GROWERS TO OPTIMIZE PRODUCTION & RESOURCES USE

agro PLUS®

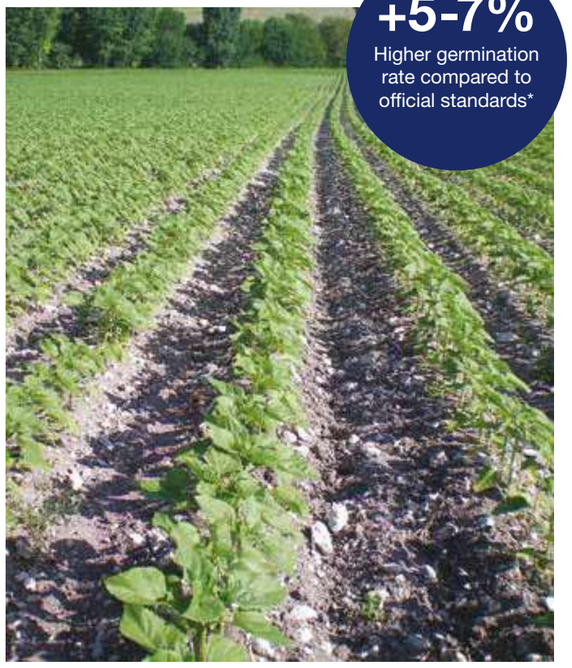
nutri PLUS®

HIGH QUALITY SEEDS FOR HIGHER YIELD

60%
of the crop yield depends on quality of emergence

MAS Seeds® and seed production:

- For MAS Seeds the hybrid seed production has always been a strategic activity.
- With more than 70 years experience we are a European leader in hybrid seed production.



+5-7%
Higher germination rate compared to official standards*

High quality seeds

- Production protocoles adapted to each variety.
- High Tech industrial capacities.
- Demanding quality controls at each step of the process.
- «A la carte» calibration methods to guarantee the best seed homogeneity in each bag.

AGRO START+

Innovation applied to the seed

- A department of experts dedicated to creation and experimentation of solutions applied to the seed.
- A High Tech coating process in our 4 factories.
- A full seed protection.
- Real booster of the germination vigour for a quicker plant development.

A direct impact on yield

- Better density because of less plant losses.
- Quicker emergence.
- Less small plants, a more homogeneous emergence.
- Better soil prospection for a better use of water and nutrients.
- Steadier yield components.

+2-7%
higher yield depending on emergence condition*

* Source: MAS Seeds database

ORGANIC SEEDS AT MAS SEEDS®

Organic farmers rely on organic seeds to meet the growing demand for certified organic products. These seeds are essential to the integrity of the supply chain for quality organic food, feed and other products.

Organic farming challenges can be quite different from conventional systems. Seed provides the genetic tools to confront these day-to-day challenges in the field.

Specific variety selection criteria

- Excellent **starting vigor** and **strong root development**.
- **Disease tolerance** in order to reduce losses through pests and secure yield.
- Management of competitive weeds: **rapid soil cover** and **row closure**, robust stems adapted to mechanical weed control.
- **Performance, stress tolerance** and regularity under all conditions.
- In order to evaluate these achievements, MAS Seeds invests every year in a special Organic test network from Terres Inovia and Arvalis.

Special production network

We have built a well-functioning network of organic seed producers who follow all the rules and requirements set out in the EU and GNIS specifications. We define a cultivation protocol adapted to the production area to produce every hybrid where the yield potential is the highest.

Own production facility

MAS Seeds® is ORGANIC certified, and we have a specific production line for organic agriculture seeds.

We renew our accreditation through semi-annual audits by a certified organization (CERTIPAQ Organic).

For over 15 years, MAS Seeds® invested in development and production of organic seeds.

WE ASKED OUR EXPERT:

What is special about ORGANIC Seed Production?

The organic production fields are well **isolated**:

- Keeping isolation distances is essential. We increased the distance from recommended 500 m to 700 m to ensure the purity.

The **sowing date** is optimized:

- Not too early, so that weeds have enough time to emerge. We carry out mechanical weed control before the sunflower is sown.
- Not too late, to not endanger the harvest. Also, special attention should be paid to botrytis. It is a criteria for the certification for organic seeds.

The **weeding** is done mechanically. We also conduct trials for innovative solutions and use some organic weed control measures.

Nicolas LABEYRIE
MAS Seeds® Seed Production Expert

Our organically produced maize and sunflower seeds portfolio:

CROP	VARIETY	TYPE	EARLINESS	EARLY VIGOR	MILDEW	DISEASE TOLERANCE	STRESS TOLERANCE
MAIZE	**MAS 075B** BIO	Flint	Very Early	***		****	****
	MAS 250F BIO	Flint	Early	****		****	****
	MAS 26R BIO	Flint-Dent	Mid-Early	****		****	****
	MAS 43P BIO	Dent	Mid Late	****		****	****
SUNFLOWER	**MAS 81K** BIO	Linoleic	Early	****	RM9	****	****
	MAS 815OL BIO	High Oleic	Early	****	RM9	****	***
	MAS 830OL BIO	High Oleic	Mid Early	****	RM9	***	***

** correct *** good **** excellent

MAIZE VARIETIES AND ADVICES 2023-24

	VARIETIES	MATURITY	FAO Silage *	FAO Grain **	USE AND CARACTERISTICS					SOWING DENSITY (grains/hectare)			
					Type of grain	Use	Energy type	GREEN+	WATER-LOCK	Silage - Optimal	Silage - Limited	Grain- Optimal	Grain - Limited
NEW	STARLORD	Ultra early	180	180	Flint	Silage, Biogas, Grain	Starchy			105 000	95 000	100 000	90 000
NEW	DM0502***	Ultra early	190	190	Flint	Silage, Biogas, Grain	Starchy	◢		105 000	95 000	100 000	90 000
	MAS 075B	Ultra early	190		Flint	Silage	Starchy	◢		105 000	95 000		
	MAS 125C	Very early		220	Dent	Grain						100 000	90 000
NEW	DM1530***	Very early	210		Flint	Silage	Starchy			105 000	95 000		
	MAS 10A	Very early	220	220	Dent	Silage, Biogas	Starchy	◢		105 000	95 000	100 000	90 000
NEW	STANLEY	Early	250	260	Flint	Silage, Biogas	Balanced	◢		98 000	88 000		
	MAS 16B	Early	240		Flint	Silage, Biogas	Balanced	◢		100 000	90 000		
	MAS 250F	Early	270	270	Flint - Dent	Silage, Biogas, Grain	Starchy	◢		95 000	88 000	90 000	85 000
	CHARLOTTA	Early	270		Flint	Silage, Biogas	Balanced	◢		98 000	90 000		
NEW	DM2522***	Early	270	270	Flint	Silage, Biogas	Balanced	◢		95 000	85 000		
NEW	MAS 275L	Early	290		Flint - Dent	Silage, Biogas	Starchy			92 000	82 000		
	MAS 23M	Early		290	Dent	Grain			◢			95 000	85 000
NEW	MAS 282K	Early		290	Dent	Grain			◢			95 000	85 000
	HULK	Mid Early	290	290	Flint - Dent	Silage, Biogas	Balanced			92 000	82 000		
	MAS 26R	Mid Early	280	280	Flint - Dent	Silage, Grain	Starchy	◢		95 000	90 000	95 000	90,000
	MAS 28A	Mid Early	280	280	Flint - Dent	Silage, Biogas	Balanced	◢		95 000	85 000	90 000	80 000
	MAS 306P	Mid Early		300	Dent	Grain						95 000	80 000
	CITADEL	Mid Early	340	340	Dent	Grain			◢			95 000	70 000
	MAS 333T	Mid Early		390	Dent	Grain			◢			95 000	75 000
	MAS 431B	Mid Early	320	360	Dent	Silage, Biogas, Grain	Balanced			95 000	85 000	90 000	80 000
	MAS 448G	Mid late		480	Dent	Grain			◢			85-95 000	70-80 000
	MAS 43P	Mid late		450	Dent	Grain			◢			90 000	85 000
	MAS 524A	Late		530	Dent	Grain						80-90 000	75-85 000
	MAS 576N	Late	540	540	Dent	Grain, Silage						75-85 000	70-80 000
	MAS 582D	Late		570	Dent	Grain						75-85 000	70-80 000
	MAS 59K	Late		580	Dent	Grain						75-85 000	70-80 000
NEW	MAS 674L	Very late		650	Dent	Grain						75-85 000	70-80 000
	MAS 765A	Very late	700		Dent	Silage, Biogas	Balanced			95 000	85 000		
	SHANIYA	Very late	720		Dent	Silage, Biogas	Balanced	◢		100 000	90 000	90 000	80 000

	VARIETIES	AGRONOMY					DISEASE TOLERANCE						VARIETIES	
		Early vigor	Dry down	Stay-green	Water stress tolerance	Harvest lodging	Fusarium (stem)	Fusarium (ear)	Hel-mintho	Eye spot	Head smut	Commun smut		
NEW	STARLORD	7	7	7	8	8	8	9	9	8	9	9	STARLORD	NEW
NEW	DM0502***	7	7	9	8	9	8	8	8	8	7	8	DM0502***	NEW
	MAS 075B	8	6	9	8	8	8	9	8	8	9	8	MAS 075B	
	MAS 125C	6	9	7	9	9	8	8	7	8	8	8	MAS 125C	
NEW	DM1530***	9	7	7	8	8	8	8	8	8	8	9	DM1530***	NEW
	MAS 10A	7	7	8	8	7	8	9	7	8	8	7	MAS 10A	
NEW	STANLEY	9	6	9	8	8	8	8	8	8	7	8	STANLEY	NEW
	MAS 16B	8	7	8	8	8	8	8	7	9	9	8	MAS 16B	
	MAS 250F	8	7	8	8	8	8	8	8	8	7	8	MAS 250F	
	CHARLOTTA	8	6	9	8	9	8	8	8	8	5	8	CHARLOTTA	
NEW	DM2522***	8	6	9	8	8	8	8	8	8	7	8	DM2522***	NEW
NEW	MAS 275L	9	7	7	7	8	8	8	8	8	9	8	MAS 275L	NEW
	MAS 23M	7	8	7	8	8	8	8	9		9	8	MAS 23M	
NEW	MAS 282K	9	8	7	8	7	7	7	8		6	8	MAS 282K	NEW
	HULK	8	8	7	7	7	8	8	7	8	7	8	HULK	
	MAS 26R	8	8	8	8	8	8	8	9	8	8	9	MAS 26R	
	MAS 28A	7	6	8	7	8	8	9	7	8	4	8	MAS 28A	
	MAS 306P	8	7	8	7	8	7	8	6		7	7	MAS 306P	
	CITADEL	7	7	7	8	7	8	8	6		8	8	CITADEL	
	MAS 333T	8	7	6	8	7	7	7	6		8	8	MAS 333T	
	MAS 431B	8	7	8	7	8	8	8	8		8	8	MAS 431B	
	MAS 448G	8	7	7	8	8	8	7	8		7	8	MAS 448G	
	MAS 43P	8	7	6	8	9	7	8	7		7	8	MAS 43P	
	MAS 524A	6	7	8	8	8	8	7	8		7	7	MAS 524A	
	MAS 576N	7	7	8	7	8	8	7	8		8	8	MAS 576N	
	MAS 582D	8	7	6	7	7	7	7	6		7	7	MAS 582D	
	MAS 59K	8	8	7	7	7	7	7	6		7		MAS 59K	
NEW	MAS 674L	8	8	8	7	8	8	8	8		8	8	MAS 674L	NEW
	MAS 765A	8	8	7	8	8	8	8	8		8	8	MAS 765A	
	SHANIYA	9	7	9	8	8	8	8	8		8	8	SHANIYA	

* Silage maturity at 32 % DM
** Grain maturity for 35% H2O for flint, 32% H2O for dent
*** In registration process

1-3 bad | 4-6 average – good | 7-9 excellent

MAKE THE BEST OUT OF EACH DROP

We at MAS Seeds® have 74 years seed experience. Historically, our breeding structures were based in France and Germany and used to provide varieties well adapted to oceanic climate.

Since 2000, our commercial deployment in central and eastern Europe combined with more severe and frequent droughts with high temperature peaks in Western Europe have leaded our breeding programs to select new hybrids with better drought tolerance.

Today, maize hybrids from MAS Seeds® portfolio that are offering a superior ability to thrive under drought stress conditions are labelled WATERLOCK.

BREEDING CRITERIAS FOR WATERLOCK HYBRIDS

Early flowering

During flowering stage maize plants are highly sensitive to drought stress. Speed up the flowering time permits to take advantage of water resources available in spring and avoid summer heat waves.

Strong root system

Strong and deep root system to explore the soil is essential to improve water uptake by the plant and to delay drought stress damages.

Synchronisation of male and female flowering

Timely synchronisation between silks emergence and pollen shed is critical to ensure proper pollination and kernel number on ear.

Leaf area index establishment and upkeep

Efficient establishment and maintenance of leaf area, even under drought stress, is a priority to maximize photosynthesis activity.

IMPROVED PHYSIOLOGICAL RESILIENCE

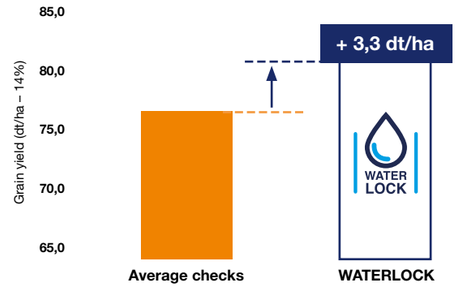
Plants have better capacity to return to a normal activity after a drought stress period.

Benefits for the farmer

In situations where maize plants have to face short or long period of drought stress, WATERLOCK maize hybrids have demonstrated their yield superiority compared to market competitors. They bring security to the farmer, and a guarantee of profitability in all weather scenarios.

WATERLOCK – maize hybrids to get the best from each drop!

WATERLOCK : performance is visible in the field



Data R&D MAS Seeds®
Seasons 2012-2020 – fields with drought stress detected

Investments in agronomy and technology

A wide maize trial network, rich of diverse weather scenarios

MAS Seeds® is develops its R&D centers in Ukraine, Romania, Russia with local breeding programs. In these regions where water supply is limited, our teams are able to identify accurately the most productive genetic resources.

A large data collection

- Phenotype data: plant morphology, physiology, yield components.
- Environmental data: climate data, soil water supply, crop management.
- Genotype data: complete genetic screening of all resources involved.

Modern data analytics methods

Our data scientist team integrates the data collected in the field and in the laboratory, in order to evaluate and predict the drought tolerance of our new coming maize hybrids.

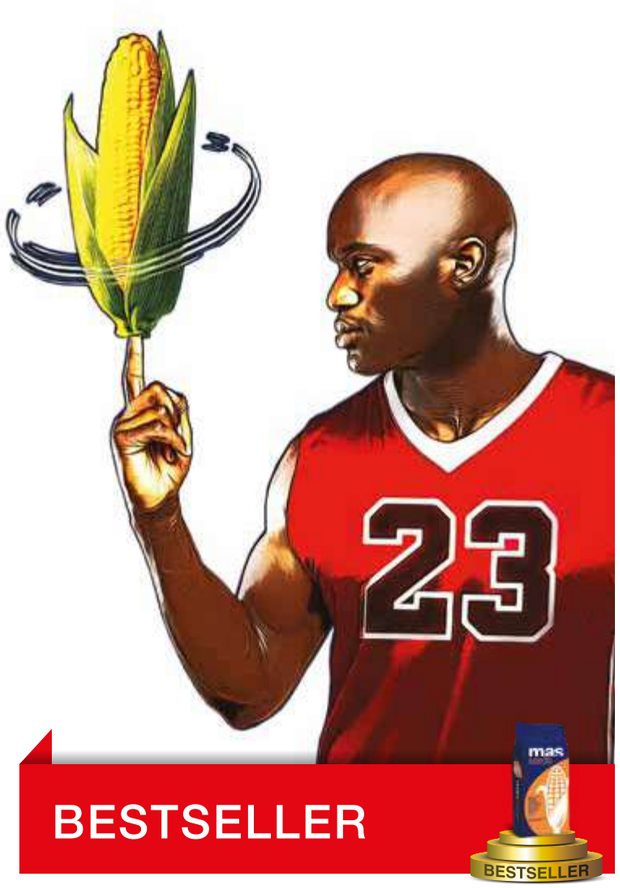
EARLY

WATER LOCK

MAS 23M

PURE DENT IN EARLY GROUP

- **PERFORMANCE IN ALL SITUATIONS**
  suitable for high and low potential
- **VERY SAFE AGRONOMY**
  short plant, good disease profile
- **DENT GENETIC WITH EARLY FLOWERING**
  low harvest moisture and widely adapted



CHARACTERISTICS

Plant height:	Short
Ear insertion:	Low
Type of grain:	Dent
Nr of rows:	14-16
Nr of grains per row:	30-34
TKW:	290-310 g
Flowering (°C):	875°C
Grain maturity 32% H_2O:	1730°C

Temperature sums, base 6°C

AGRONOMY

Early vigor:	7
Stay green:	7
Dry down:	8
Helminthosporium :	9
Fusarium (ear):	8
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

GROWING RECOMMENDATIONS

	Optimal conditions	Limited conditions
Adaptation	++++	++++
Density (Grain Pl/ha)	95 000	85 000

LATE

MAS 59K

THE BALANCED YIELD SOLUTION

- **HIGH YIELD POTENTIAL**
  in all growing situations
- **BALANCED PLANT**
  to secure the harvest
- **STRONG EARLY VIGOR**
  to secure crop installation

CHARACTERISTICS

Plant height:	Medium
Ear insertion:	Low
Type of grain:	Dent
Nr of rows	16-18
Nr of grains per row:	43-45
TKW:	345 g
Flowering (°C):	1015°C
Grain maturity 32% H_2O:	2040°C

Temperature sums, base 6°C

AGRONOMY

Early vigor:	8
Stay green:	7
Dry down:	8
Helminthosporium:	6
Fusarium (ear):	7
Lodging:	7
Drought tolerance:	7

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

MID LATE

WATER LOCK

MAS 448G

STRONG AND YIELDY

- **HIGH YIELD PERFORMANCE**
  on FAO 400 market
- **SECURE PLANT QUALITY**
  top agronomy with good diseases profile
- **SHORT AND STABLE PLANT**

CHARACTERISTICS

Plant height:	Short
Ear insertion:	Low
Type of grain:	Dent
Nr of rows:	16
Nr of grains per row:	34-36
TKW:	320 g
Flowering (°C):	980°C
Grain maturity 32% H_2O:	1960°C

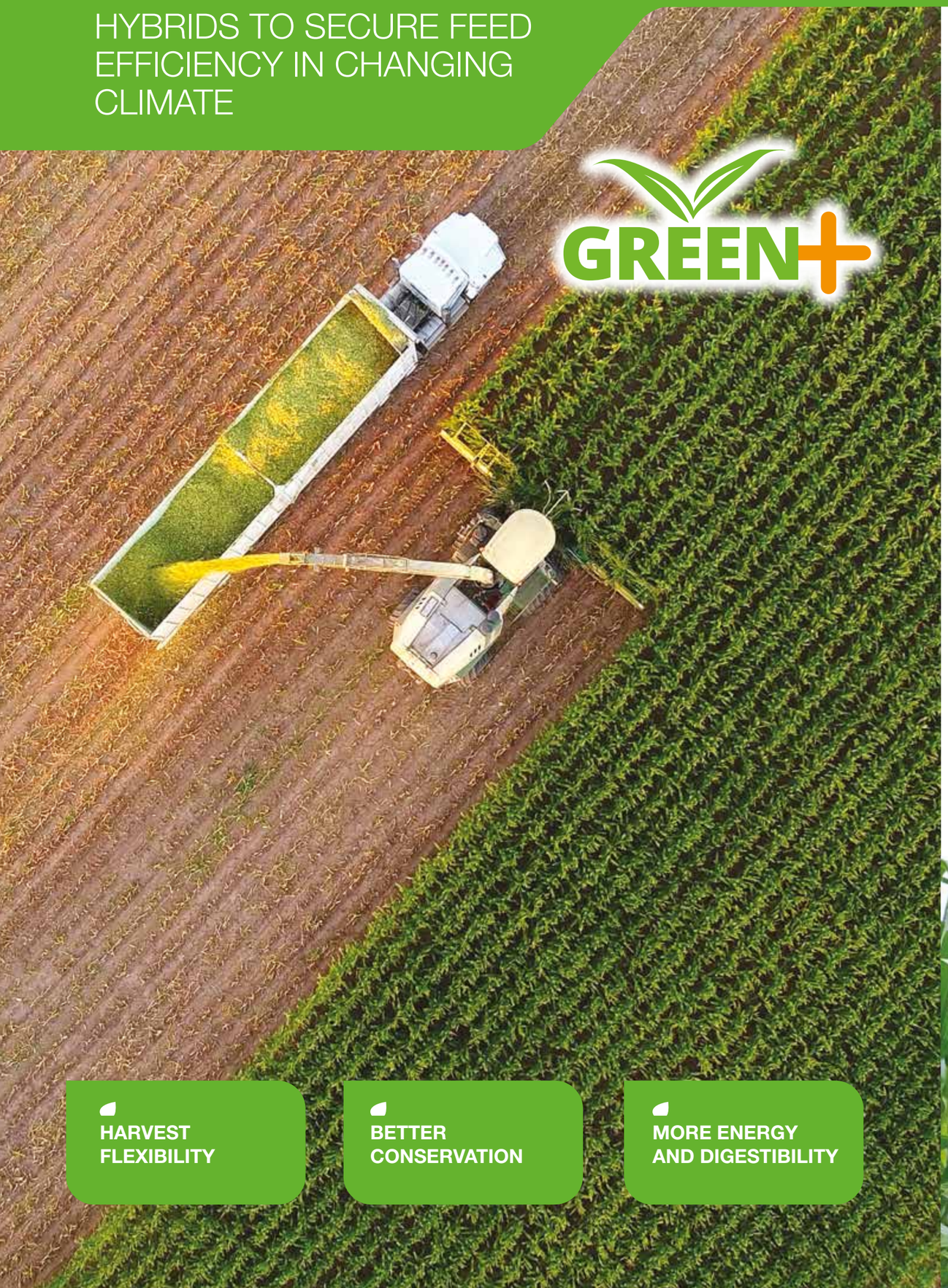
Temperature sums, base 6°C

AGRONOMY

Early vigor:	8
Stay green:	7
Dry down:	7
Helminthosporium:	8
Fusarium (ear):	7
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

HYBRIDS TO SECURE FEED EFFICIENCY IN CHANGING CLIMATE



BREEDING CRITERIAS

Harvesting high-quality silage at correct maturity is a major objective for the farmers in order to ensure the feeding of their dairy cows. Milk production is closely linked to the **quality of harvested and stored silage.**

In addition to dry matter (DM) yield, feed value and starting vigour, **MAS Seeds® maize silage R&D has worked for 15 years on drought tolerance** of plants. **GREEN+ portfolio** is the result of this research.

KEY RESEARCH AXES OF MAS SEEDS® SILAGE R&D PROGRAM:

- DM yield/ha
- Feed value (starch & digestibility)
- **GREEN+***
- Starting vigour

*GREEN+ is defined as genetic ability of a variety to delay maturity of leaves and stems, and so maintain their photosynthetic area active for longer period.

Characteristics and advantages of GREEN+ hybrids for farmers:

HARVEST

- Good **stay-green** of the plant
- More **flexibility to harvest** **+5 to 10 days***
- Better organisation of **harvest planning**

STORAGE IN SILO

- More **soluble sugars** in the plant
- Better **conservation in silo** **+3% of green forage grain***
- Quicker start of fermentation and **pH decrease**

FEEDING

- Slower evolution of **grain dry matter**
- Higher **valorisation of starch** **+5% digestible starch***
- Grains easier to crash

*Source: MAS Seeds® trial results in mini clamps – 2017 & 2018.

EARLY

GREEN+

MAS 250F

STARCH ENERGY

GOOD YIELD IN ALL CONDITIONS

- **VERY GOOD YIELD**
  in all conditions
- **HIGH LEVEL OF STAY GREEN**
  to secure harvest and conservation
- **GOOD FEED VALUE**
  thanks to a good level of starch

BESTSELLER

CHARACTERISTICS

Plant height:	Medium - High
Ear insertion:	Medium
Type of grain:	Flint - Dent
Nr of rows:	16
Nr of grains per row:	32-34
Flowering (°C):	850°C
Silage maturity 32% DM:	1460°C
Grain maturity 35% H2O:	1750°C

Temperature sums, base 6°C

AGRONOMY

Early vigor:	8
Stay green:	8
Dry down:	7
Helminthosporium:	8
Fusarium (ear):	8
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

FEED VALUE

Starch:
dNDF:
Energy:

GROWING RECOMMENDATIONS

	Optimal conditions	Limited conditions
Adaptation	++++	++++
Density (Silage Pl/ha)	95 000	85 000

MAS 250F is a voluminous plant with large leaves adapted in many situations and also in cold area thanks to its good behavior in stressful conditions.

The hybrid has a good stay green, it secures the quality of silage harvest and conservation.

VERY EARLY

GREEN+

MAS 10A

STARCH ENERGY

THE MIXT PERFORMANCE

- **DOUBLE PERFORMANCE**
  high yield in silage and grain
- **ADAPTATION**
  with superb ability to build regular cobs in any condition
- **HIGH DISEASE RESISTANCE**
  to fusarium, helmintosporium and eyespot

CHARACTERISTICS

Plant height:	Medium - Short
Ear insertion:	Medium - Low
Type of grain:	Flint
Nr of rows:	16-18
Nr of grains per row:	24-28
TKW:	260-280 g
Flowering (°C):	770°C
Silage maturity 32% DM:	1340°C
Grain maturity 35% H2O:	1585°C

Temperature sums, base 6°C

AGRONOMY

Early vigor:	7
Stay green:	8
Dry down:	7
Helminthosporium:	7
Fusarium (ear):	8
Lodging:	7
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

FEED VALUE

Starch:
dNDF:
Energy:

VERY EARLY

NEW

STARLORD

STARCH ENERGY

THE STAR OF THE FUTURE

- **VERY GOOD LEVEL OF DIGESTIBILITY**
- **VERY GOOD STAY GREEN**
- **HIGH SILAGE POTENTIAL**

CHARACTERISTICS

Plant height:	Medium
Ear insertion:	Medium
Type of grain:	Flint
Nr of rows:	16-18
Nr of grains per row:	28-32
TKW:	330-340 g
Flowering (°C):	770°C
Silage maturity 32% DM:	1290°C
Grain maturity 35% H2O:	1290°C

Temperature sums, base 6°C

AGRONOMY

Early vigor:	7
Stay green:	7
Dry down:	7
Helminthosporium:	9
Fusarium:	8
Fusarium (ear):	9
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

FEED VALUE

Starch:
dNDF:
Energy:

EARLY NEW GREEN+

STANLEY

BALANCED ENERGY

THE BEST DIET FOR YOUR COW

- **GOOD PERFORMANCE IN STRESS CONDITION**
- **VERY GOOD STAY GREEN AND EARLY VIGOR**
- **GOOD FEED VALUE**
  a top agronomy and tolerance to diseases

CHARACTERISTICS

Plant height:	Medium - High
Ear insertion:	Medium
Type of grain:	Flint
Nr of rows:	16
Nr of grains per row:	28-32
TKW:	320-330g
Flowering (°C):	840°C
Silage maturity 32% DM:	1440°C
Grain maturity 35% H2O:	1700°C

Sum of temperature in °C based on AGPM

AGRONOMY

Early vigor:	9
Stay green:	9
Dry down:	6
Helminthosporium:	8
Fusarium (ear):	8
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

FEED VALUE

Starch:
dNDF:
Energy:

EARLY GREEN+

CHARLOTTA

A TREAT FOR THE COWS

BALANCED ENERGY

- **ELITE YIELD POTENTIAL**
  the strongest in difficult situation
- **TOP AGRONOMY**
  good early vigor and healthy plant
- **GREEN+ GENETICS**
  ensures a flexible harvest window and good conservation of silage

AGRONOMY

Early vigor:	8
Stay green :	9
Dry down:	6
Helminthosporium :	8
Fusarium (ear):	8
Lodging:	9
Drought tolerance:	8

VERY LATE GREEN+

SHANIYA

BALANCED ENERGY

BIG PLANT FOR SILAGE

- **GOOD LEVEL OF YIELD**
  in all potential conditions
- **GOOD FEED VALUE**
  thanks to the digestibility of fibers
- **GOOD CROP ESTABLISHMENT**

AGRONOMY

Early vigor:	9
Stay green :	9
Dry down:	7
Helminthosporium :	8
Fusarium (ear):	8
Lodging:	8
Drought tolerance:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

SELECT A SILAGE VARIETY SUITABLE FOR YOUR CATTLE DIET

The nutritional quality of silage varieties is in the heart of our silage maize breeding program. The energy in the maize silage comes from the starch and the fiber digestibility of stem and leaves. MAS Seeds® has determined 2 different energy types to categorize maize silage varieties, depending on the dominant source of the energy:

- **Balanced energy varieties**
- **Starchy energy varieties**

Principle of the approach

All MAS Seeds® silage varieties are analyzed for their nutritional quality and the ratio of their fiber and starch energy at harvest between 32 and 35% DM. We then categorize varieties by their energy profile and we recommend them depending on the diet practiced by the cattle farmers.

Practiced diet	Maize silage dominant	Grass and alfalfa dominant
Maize ratio	**More than 70% maize**	**Less than 70% maize**
Recommended maize silage profile	• Need fiber digestibility in maize • No excess starch • Acidosis risk management	• Need energy concentration • Quick available energy • High level of starch
Feeding Period	Late Autumn - Winter	Spring - Summer - Early autumn
Silage Energy profile	BALANCED ENERGY	STARCH ENERGY
Use Advices	Can be supplemented with energy concentrates: Grain or cereal Maize cob mix	• It combines excellently with our ALFALFA varieties and FORAGE mixtures • Limit additional source of starch (acidosis risk)

Higher methane production with MAS Seeds® biogas hybrids

Maize is the main substrate (~ 50-60%) for the most biogas plants as it is a unique crop with the highest carbon efficiency per hectare.

The main criteria for highest methane production/ha:

Massive yield in dry matter (DM)

Methane production in liter per kg of DM.

We observe in our network of biogas trials that the production of methane/ ha is directly linked to **DM yield. This is the key criteria of selection of our biogas varieties in MAS Seeds®, respecting a minimum of 32% of DM to ensure the best quality of plant.**

MAS Seeds® research is also focused on secondary parameters:

High stay green

- to secure the harvest window
- to have a quicker fermentation on the silo and a better conservation of the quality.

Good fat content: Increase biogas production.

Good level of hemicellulose for a better retention time in the digester.

OUR BIOGAS SEED PORTFOLIO

VARIETIES	Maturity	Type	Biogaz/ha yield	"Biogaz Index (RATH Formule)"	Stay green	Fat	Hemicellulose
MAS 10A	Very early	Flint	***	****	****	***	****
MAS 195P	Early	Flint	***	****	****	****	****
STANLEY	Early	Flint	***	****	****	****	****
MAS 250F	Early	Flint - Dent	****	***	****	****	***
CHARLOTTA	Early	Flint	****	***	***	****	***
MAS 26R	Mid-early	Flint - Dent	****	***	****	****	***
MAS 431B	Mid-early	Dent	****	***	***	***	***
MAS 765A	Late	Dent	****	****	****	****	***
SHANIYA	Late	Dent	****	***	****	****	***

** correct *** good **** excellent

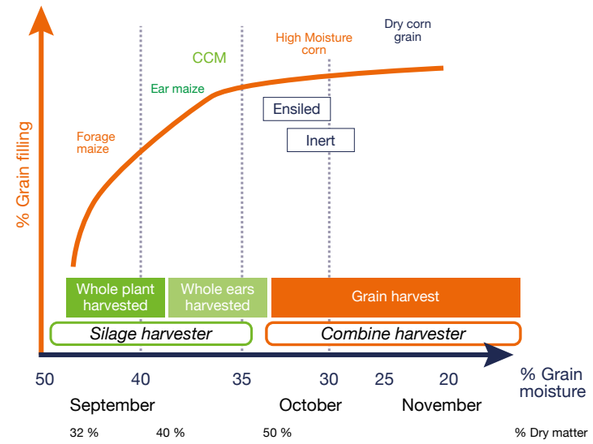
High moisture maize for animal feeding

Maize is an excellent source of energy for animals and can be harvested at different maturities depending on the final use.

High moisture maize (HMC) is a farmland grown feed resource, which increases farm sustainability by limiting purchasing of off-farm feeds, transport and cost of energy for drying. It can be ensiled or stored in oxygen-limiting storage structures for a natural conservation.

The advantages in using HMC are numerous for pigs, dairy cows, beef, sheep and ducks: **nutritive, economic and organisational.**

The different harvesting methods of maize



Our advices to take the best profit from high moisture maize

The main target is to guarantee a **healthy maize** crop and avoid mycotoxins development due to fusarium:

- harvest before November 1st (select hybrids with an adapted maturity)
- destroy and bury harvest residues
- control grain borers.

Advantages of high moisture maize

1. No drying cost
2. A source of quicky digestible starch
3. A multipurpose feed
4. An efficient use of maize grown on farm.
5. An adapted and easy form of storage.

MAS Seeds® maize varieties for high moisture maize use

Each MAS Seeds® maize hybrid is **evaluated** by our R&D teams in our European trial network. Following characteristics are considered to put one variety in high moisture portfolio.

VARIETIES	Maturity	Type	Fusarium	Ease of grinding	Feed value	Protein	Quality of fat
STARLORD	Very early	Flint	****	***	****	***	****
MAS 125C	Very early	Dent	****	***	****	***	****
STANLEY	Early	Flint	****	**	****	****	***
MAS 23M	Early	Dent	****	****	***	***	****
MAS 448G	Mid-late	Dent	****	****	****	****	***
MAS 59K	Late	Dent	****	****	****	***	****
MAS 78T	Very-late	Dent	****	***	****	****	****

** correct *** good **** excellent

AGROSTART® MAIZE SEED APPLIED SOLUTION

AGRO START®

INNOVATIVE MAIZE SEED CARE
FOR BETTER FIELD ESTABLISHMENT AND YIELD SAFETY

Biostimulant

+ Fungicide

AGROSTART®: MORE THAN A SEED TREATMENT, IT IS AN INNOVATIVE TECHNOLOGY!

Innovative formulation to boost and protect plants in all environments

The innovative AGROSTART standard formulation for stronger and well protected seedling.

Two advanced formulations for environments with higher pest pressure, composed with the standard formulation and complementary solutions.

AGRO START®

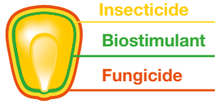
STANDARD FORMULATION

- **Biostimulants:** a new humic acid formulation to improve the absorption of nutrients available around seedling.
- **Fungicide:** prevents damage during the early growth phase from fungus and secure the emergence.

AGRO START® + INSECT

ADVANCED FORMULATION FOR SOIL INSECT PRESSURE

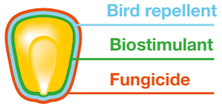
- **Biostimulant** and **fungicide** standard formulation.
- **Insecticide** (FORCE® 20 CS): protects against the principal soil insects as wireworms.



AGRO START® + BIRD

ADVANCED FORMULATION FOR BIRD PRESSURE

- **Biostimulant** and **fungicide** standard formulation.
- **Bird repellent** (KORIT®).



Benefits at field establishment and harvest

Boost and protect the seedling for a better emergence:

- Quicker and more regular emergence
- Higher emergence rate in cold conditions (+ 5% of raised plants)
- Better roots exploration and nutrient absorption

Improve yield in all situations, especially in cold conditions at emergence:

- + 3% Yield in average*
- + 11% Yield in cold conditions at emergence*

* Compared to standard treatment. Source: MAS Seeds® Research in Seeds Production Data

TROPICAL MAIZE

Tropical maize acquisition

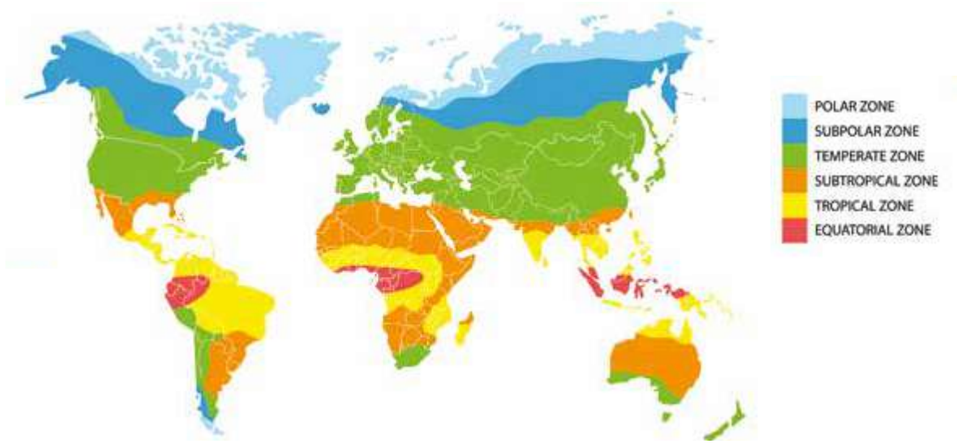
In 2019, MAS Seeds® purchased a tropical maize program, to address the more than 30 millions of non-GMO hectares of hybrids that are grown in sub-tropical and tropical areas in the world. With a **breeding station in Mexico** original country of maize domestication and its counterpart in **Ivory Coast**, MAS Seeds® brings genetic diversity into its programs and enlarges its maize products' portfolio available for the myriad of environments which exist worldwide.

An innovative portfolio

There is a large diversity of markets in subtropical and tropical countries. Nevertheless, hybrids need to demonstrate common abilities in these growing areas: **tolerance to heat/limited drought periods and diseases pressure**. Our MAS Seeds® portfolio combines these assets to propose a range of products very stable in terms of yield across the different environments and weather conditions they face.

Our tropical maize portfolio compiles yellow and white maize hybrids, usable for grain or silage, to cover farmers' requirements: from robust plants suitable for rainfed cultivation to strong hybrids built for intensive-high inputs agriculture. Their harvest can be used for many purposes: human consumption, animal feeding and industry.

World climate zones



Perspective of deployment

The products of the MAS Seeds® tropical portfolio have been tested for several years now in Mexico and West Africa. Since then, **tropical maize sales have been launched in a positive dynamic in Mexico and Ivory Coast, with active promotion in Ghana and prospection in Nigeria & Benin.**

This adaptation brings ambition to expand our product range and develop our sales in our new markets, particularly in subtropical and tropical areas of Africa, Asia and America.

VARIETIES	MATURITY	USE AND CARACTERISTICS			SOWING DENSITY (grains/hectare)			
		Type of grain	Use	Energy type	Silage - Optimal	Silage - Limited	Grain- Optimal	Grain - Limited
MASTROP 144	Tropical	Orange Dent	Grain				90,000	85,000
MASTROP 143	Tropical	Orange Dent Flint	Grain Silage	Fast	95,000	85,000	90,000	85,000
MASTROP 103	Tropical	Orange Flint	Grain Silage	Balanced	90,000	80,000	85,000	70,000
MASTROP W43	Tropical	White Dent Flint	Grain Silage	Balanced	95,000	85,000	90,000	80,000

AGRONOMY			DISEASE TOLERANCE				VARIETIES
Early vigor	Dry down	Stay-green	Fusarium (stem)	Fusarium (ear)	Hel-mintho	Eye spot	
8	8	6	7	7	8	7	MASTROP 144
9	8	9	7	8	8	7	MASTROP 143
8	9	7	8	8	9	7	MASTROP 103
9	8	9	6	7	7	7	MASTROP W43

YELLOW MAIZE

MASTROP 144

THE HIGH POTENTIAL VARIETY

- **GOOD ADAPTABILITY**
  has demonstrated adaptability skills in varied conditions
- **A DENT SMOOTH & FLOORY GRAIN**
  these characteristics make it suitable for cattle feed and poultry (rich in flour)
- **GOOD YIELDS ON FIELDS**
  and a quick dry down to harvest early

CHARACTERISTICS

Plant height:	2,7 m
Ear insertion:	1,2 m
Grain Type:	Yellow - Dent
Flowering date:	51-78 days (depending on environment)
Fusarium:	7
Helminthosporium:	8
Lodging:	7
Number of rows:	16-18
Number of grains/row:	36-38
TKW (15% moisture):	330 g

ADAPTABILITY

Optimal conditions	Limited conditions
+++	+++

YELLOW MAIZE

MASTROP 143

A POWERFUL, STABLE AND REASSURING VARIETY

- **FOR ALL YOUR USES**
  a 'all-terrain' plant, well covered ears and a quality yellow grain
- **A PROFITABLE VARIETY**
  MASTROP143 is suitable for food uses and cattle feeding
- **STRONG DISEASES TOLERANCE**
  a variety tolerant to leaf diseases that will not dry out prematurely

CHARACTERISTICS

Plant height:	2,8 m
Ear insertion:	1,2 m
Grain Type:	Yellow - Dent - Flint
Flowering date:	51-74 days (depending on environment)
Fusarium:	8
Helminthosporium:	8
Lodging:	8
Number of rows:	16-18
Number of grains/row:	36
TKW (15% moisture):	330-360 g

ADAPTABILITY

Optimal conditions	Limited conditions
++++	+++

ORANGE FLINTY MAIZE

MASTROP 103

GOOD PROFIT FOR ALL OCCASIONS

- **FOR ALL TYPES OF FIELDS**
  better in early planting, MASTROP 103 is a maize hybrid adapted to all situations and soil types
- **STABLE AND RUSTIC**
  with MASTROP 103, I secure my yield and my profitabilty
- **A VERY NICE GRAIN**
  elongated cob, smooth and orangey, good nutritional value for food and industrial use (gritz, poultry, farming, brewery)

CHARACTERISTICS

Plant height:	2,6 m
Ear insertion:	1,2 m
Grain Type:	Orange - Flint
Flowering date:	53-80 days (depending on environment)
Fusarium:	8
Helminthosporium:	9
Lodging:	7
Number of rows:	14-16
Number of grains/row:	39-40
TKW (15% moisture):	330-360 g

ADAPTABILITY

Optimal conditions	Limited conditions
+++	++++

WHITE MAIZE

MASTROP W43

THE BEST OF WHITE MAIZE FOR YOUR BEST FIELDS

- **GOOD GRAIN QUALITY**
  its grain has a very good quality, rich in flour and with a very nice white color
- **A WELL-BALANCED PLANT**
  nice ear, beautiful plant, stable and well developed
- **AN ATTRACTIVE YIELD POTENTIAL**
  planting for the best harvest potential

CHARACTERISTICS

Plant height:	2,8 m
Ear insertion:	1,3 m
Grain Type:	White - Dent
Flowering date:	57-80 days (depending on environment)
Fusarium:	7
Helminthosporium:	7
Lodging:	7
Number of rows:	14-16
Number of grains/row:	38-40
TKW (15% moisture):	330-360 g

ADAPTABILITY

Optimal conditions	Limited conditions
+++	++

SUNFLOWER VARIETIES AND ADVICES 2023-24

	VARIETIES	HARVEST MATURITY	FLOWERING MATURITY	USE AND CARACTERISTICS							SOWING DENSITY (grains/hectare)		ADAPTABILITY		AGRONOMY			DISEASE TOLERANCE							
				Oil type	Oil content	Oleic acid content	Herbicide tolerance	Broomrape tolerance	Helio-SMART	NORUST	Optimal conditons	Limited conditions	Optimal conditons	Limited conditions	Early vigor	Water stress tolerance	Lodging	Mildiew	Verticillium	Sclerotinia (head)	Sclero-tinia (collar)	Pho-mopsis	Phoma		
NEW	DT3202CP*	Early	Early	Linoelic	44-45%		Clearfield® Plus	E			65-68 000	55-60 000	••••	••••	**7**	8	8	RM3	7	8	7	7	7	DT3202CP*	NEW
NEW	DT7002*	Early	Early	Linoleic	43-45%			G		◢	65-68 000	55-60 000	••••	••••	7	8	9	RM9	7	9	8	7	7	DT7002*	NEW
	MAS 804G	Early	Early	Linoleic	44-45 %			G			65-70 000	50-60 000	••••	••••	7	8	9	RM9	8	7	9	7	6	MAS 804G	
NEW	MAS 817P	Early	Early	Linoleic	43-45%			G			65-70 000	50-60 000	••••	••••	7	8	9	RM3	7	9	9	7	6	MAS 817P	NEW
	MAS 83SU	Early	Mid Early	Linoleic	45-47%		Express® SX	E		◢	65-68 000	50-55 000	•••	••••	8	8	7	RM9	7	7	6	9	7	MAS 83SU	
	MAS 85SU	Mid Early	Mid Late	Linoleic	46-47%		Express® SX	E		◢	70 000	65 000	••••	••••	8		7	RM9	8	8	8	8	8	MAS 85SU	
	MAS 920CP	Mid Early	Mid Early	Linoleic	43-45%		Clearfield® Plus	E	◢	◢	65-70 000	60-65 000	••••	••••	8	9	9	RM9	8	9	9	8	8	MAS 920CP	
	MAS 98K	Mid Early	Mid Early	Linoleic	44-45%			E			65-70 000	60-55 000	••••	••••	7	8	9	RM9	9	8	9	9	8	MAS 98K	
NEW	DOVERCLP	Mid Late	Mid Late	Linoleic	45-47%		Clearfield® Plus	G			68-72 000	58-60 000	••••	••	6	7	9	RM9	7	7	9	7	7	DOVERCLP	NEW
NEW	DT3402TT*	Mid Late	Mid Late	Linoleic	42-44%		Express SX	E	◢	◢	65-68 000	50-60 000	••••	••••	7	8	9	RM9	8	9	8	8	7	DT3402TT*	NEW
	MAS 92CP	Mid Late	Mid Early	Linoleic	44-49%		Clearfield® Plus	E		◢	68 000	62 000	••••	••••	7	9	6	RM9	7	8	9	7	8	MAS 92CP	
	MAS 815OL	Early	Mid Early	High Oleic	45-47%	89-91%		/			65-68 000	50-55 000	••••	•••	7	8	9	RM9	8	7	8	7	7	MAS 815OL	
	MAS 89HOCL	Early	Mid Early	High Oleic	45-47%	87-90%	Clearfield®				75 000	65 000	••••	••••	7	7	7	RM9	7	6	7	8	7	MAS 89HOCL	
	DT3301OL*	Mid Early	Mid Early	High Oleic	44-45%	85-86%		/			65-68 000	50-55 000	••••	•••	7	7	8	RM9	7	9	7	7	7	DT3301OL*	
	MAS 826OL	Mid Early	Mid Early	High Oleic	44-45%	88-90%		/			67-70 000	55-60 000	••••	•••	7	7	9	RM9	7	8	9	7	7	MAS 826OL	
	MAS 86OL	Mid Late	Mid Early	High Oleic	45-47%	84-87%		E		◢	70 000	65 000	••••	•••	8	8	7	RM9	9	8	7	7	8	MAS 86OL	
NEW	MAS 908HOCP	Mid Late	Mid Late	High Oleic	44-45%	84-85%	Clearfield® Plus	E	◢	◢	65-68 000	50-55 000	••••	•••	6	7	8	RM9	8	8	9	8	7	MAS 908HOCP	NEW
NEW	MAS 910OL	Mid Late	Mid Early	High Oleic	44-45%	87-89%		E	◢	◢	65-68 000	50-55 000	••••	••••	7	8	8	RM9	8	9	8	8	8	MAS 910OL	NEW

* In registration process

THE BEST DISEASE TOLERANCE TO SECURE THE YIELD

HelioSMART hybrids have the highest genetic tolerance to the main diseases of sunflower

Managing the risk of diseases is a major issue for sunflower cultivation because diseases can impact the yield by 30% up to 100% depending on the conditions and the intensity of the attacks, and furthermore can decrease the oil quality.
Sunflower diseases have a direct impact on the income of farmers and the performance of sunflower grain collectors. Good agricultural practices must be accompanied by genetic innovations.

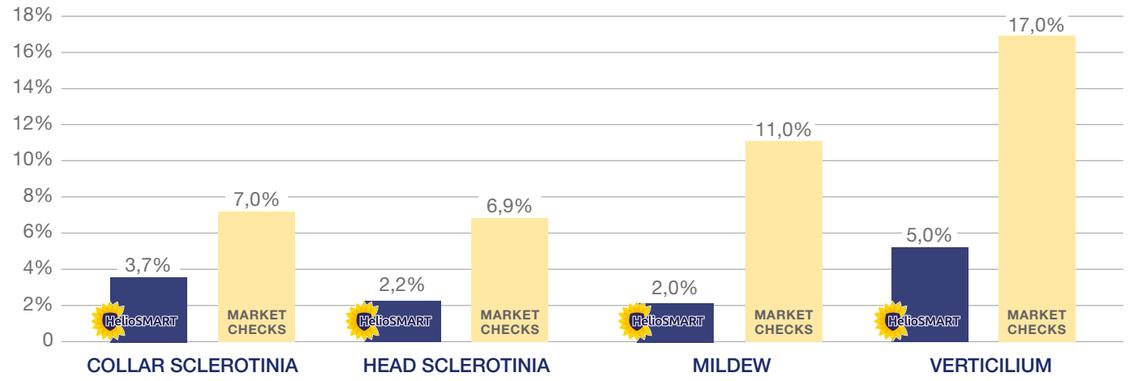
HelioSMART hybrids are the results of a breeding program with the best tolerance against main sunflower diseases, in particular mildew, present at the start of the cycle, sclerotinia, which attacks mainly from flowering, and verticillium, the signs of contamination of which appear more at the end of the cycle. This genetic innovation is the result of many years of research and experimentations carried out in area where disease pressure is the highest across Europe.

HelioSMART hybrids diseases profile

- **Verticillium**: 8-9***
- **Sclerotinia**: <5% attacks**
- **Mildew**: RM9 profile**

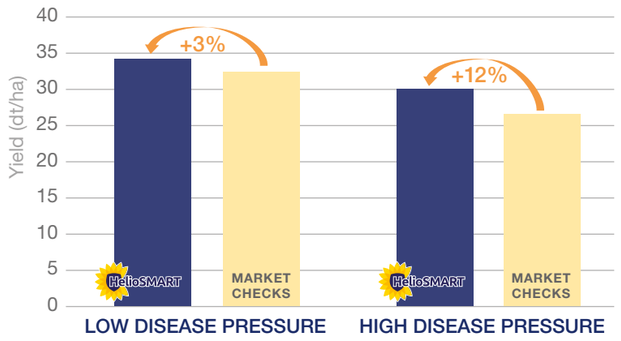
* 1= bad 9= very good
** Based on MAS Seeds® R&D network

CONTAMINATION LEVEL (%)



Results from MAS Seeds® R&D network from 2019 to 2022

HelioSMART hybrids are selected on their high productivity in all disease situations



Results from MAS Seeds® R&D network 2019-21, average with competitors, HelioSMART hybrids and classic hybrids.

The HelioSMART hybrids have contamination levels that are 3 to 15% lower than the market reference varieties.

This translates into **an increase in crop yield up to 12% in high disease pressure situations.**In low disease pressure, HelioSMART hybrids offer in average 3% yield bonus compared to market standards.

HelioSMART hybrids ensure high performances whatever disease pressure conditions.

SUNFLOWER HYBRIDS WITH THE BEST TOLERANCE TO BLACK RUST

Black rust life cycle and symptoms on sunflower

Black rust is a disease caused by the Basidiomycota fungi Puccinia helianthi spp. Originally discovered in the United Sates, the disease is now widely spread in most of sunflower planted areas all over the world and is a major problem in several regions of Russia and Ukraine.

	Two internodes stage **BBCH32**	Inclined flower bud **BBCH61**	Falls of ligulate flowers **BBCH73**
			
PERIOD	**June** After over-wintering in crop residues, telia germinates and the fungi infect sunflower leaves.	**End of June to end of August** Reproductive and spraying phase. Pustules appear after 2 weeks on both sides of leaves and repeat cycle every 10-14 days.	**August to harvest** Cold temperatures or maturity of sunflower stop reproductive phase and induce the change to overwintering stage (Telia).
SYMPTOMS	**Pycnia:** Yellow-orange spot on top side of lower leaves. **Aecia:** orange spots on underside of lower leaves in opposite of pycnia.	**Uredinia:** Orange-brown spot with spores on both side of leaves.	**Telia:** dark brown-black spots without spores.

Impact on sunflower crop: up to 80% yield losses

Black rust induces several impacts on sunflower by pumping nutrients:

- Increase of transpiration (water losses).
- Decrease of plant nutrients transfer to the grains.
- Acceleration of senescence.
- It can induce huge impacts on sunflower performances, depending on the severity of the attack: 25 to 80% yield losses and 4 to 15% oil content losses.
- The impact on yield is already significant if 1% of leaf area is infected by either Uredinia or Telia.

The solutions against black rust

Crop rotation: Respect a delay of 4 years between two sunflowers in the same field.

Plant protection: Fungicides, apply at first symptoms of rust (1% of leaf area infected) to limit further development.

Genetic: Choice of hybrids tolerant to rust.

MAS Seeds® genetic solution: NORUST hybrids

NORUST hybrids have the best tolerance against black rust in the market:

For many years, MAS Seeds® have invested to evaluate its hybrids under Black rust pressure.

We use a large range of supports (R&D network, Marketing demo fields, Commercial fields) to characterize the tolerance of each hybrid.

With NORUST hybrids, you reduce black rust in all situations:

- **In low pressure:** no visible symptoms.
- **In high pressure without fungicides:** later appearance of Black rust infection and less impact compared to competitors.
- **In high pressure with fungicides:** only minimal infection and less impact compared to competitor.

Picture: comparison of MAS 93CP against competitor in high pressure of black rust

NORUST hybrids

TECHNOLOGY	CLASSIC	EXPRESS® SX HERBICIDE	Clearfield® Plus Production System for Sunflower	IMISUN HERBICIDE TOLERANT
SUNFLOWER HYBRID	**MAS 850B** **MAS 910OL** **MAS 81K** **MAS 96P** **MAS 86OL**	**MAS 83SU** **MAS 85SU** **DT3402TT*** **MAS 880SU**	**MAS 920CP** **MAS 92CP** **MAS 93CP** **MAS 908HOCP**	**BLADE**

* In registration process

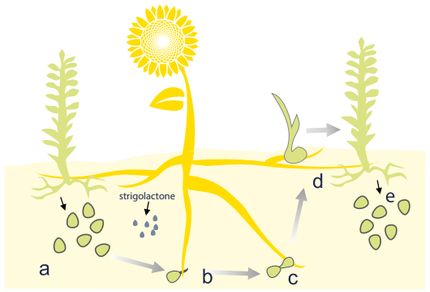
BROOMRAPE: A KEY PARASITE TO MANAGE CAREFULLY

Orobanche cumana (english: broomrape) affect significantly final sunflower yield. This parasitic plant, affecting specifically and exclusively sunflower (and some other Helianthus types), is expanded around the Black sea and also in south of Spain and in few regions in France. Fortunately, solutions exist to manage broomrape and reduce his impact on yield. Between herbicide tolerant sunflowers and hybrids genetically tolerant to F, G and G+ races, MAS Seeds® propose a large choice of solutions for farmers. Nevertheless, some basic best practices are important to secure the field and limit the propagation of Orobanche Cumana.

Orobanche cumana life cycle

Broomrape plant produce thousands of seeds kept in soil many years before emergence (a).
Broomrape seeds germination is stimulated by sunflower: strigolactone released in soil by sunflower roots (b).
Fixation on sunflower roots, broomrape grows using sunflower energy and produce seeds (c, d, e).

Choosing adapted sunflower hybrids, broomrape can't emerge and produce new seeds: most effective strategy to avoid increasing number of seeds in fields and develop new contamination areas.



Cultivation practices under broomrape infestation

Before sowing – rotation
- Identify risky fields
- Implement proper crop rotation: minimum 3 years between 2 sunflower crops in the same field

Variety choice – cultural operations
- Use sunflower **hybrids genetically tolerant to broomrape** race identified or use a Clearfield/Clearfield PLUS variety
- Clearfield or Clearfield® PLUS hybrids → use proper herbicide sprayed at maximum advised dosis**
- Choose **double protection (hybrid genetically tolerant to broomrape + Clearfield® PLUS) for hardest cases**
- Avoid nutrients deficiency in order to have strong sunflower crop

After harvest
- Harvest orobanche-free fields first & infested fields at the end
- **Clean carefully harvesting equipment** between each fields
- Bury residues in soil to avoid broomrape seeds dispersion by wind and wild animals

MAS Seeds® solutions for broomrape infested areas

EARLINESS	CONVENTIONAL	Clearfield Plus	OPTIMISED FOR EXPRESS™ HERBICIDE
EARLY MID EARLY	**JULIUS MAS 804G MAS 817P DT7002***		**MDS5123LS***
MID LATE LATE	**MAS 91G MAS 90F MAS 96P**	**DOVER CLP MAS 93CP MDS5523LP***	**MAS 880SU**

* In registration process

**For right hybrid choice and dosis advices, don't hesitate to ask your local MAS Seeds® contact

HIGH OLEIC SUNFLOWERS – HIGH VALUE CROP FROM GROWER TO ENDUSER

An extra price for farmers, a healthier oil, an useful oil composition for companies, **High Oleic (HO) Sunflowers** all have qualities to seduce the protagonists of the sunflower market.

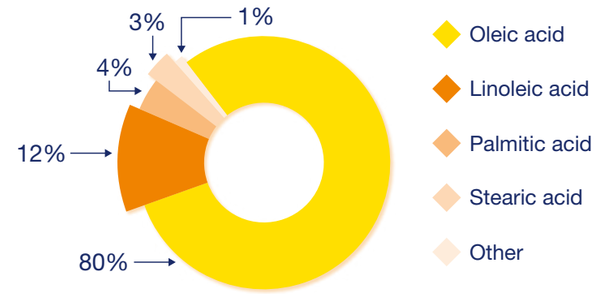
What is a HIGH OLEIC sunflower?

HO sunflowers are different in oil composition. Contrary to linoleic sunflowers, the oil transformation chain is blocked by enzymes before the full transformation. The transformation from oleic acid to linoleic acid is stopped and the concentration of oleic acid increases and surpasses easily 80% (vs 20% for linoleic sunflowers).

In field, there are none differences in cultivation practices between the two types of sunflower and the oil content is also the same.

For a HO sunflower, **30 days following the flowering are particularly important** to establish the oil content and the oleic acid content.

High oleic sunflower composition



Why is it useful to cultivate HO sunflowers?

Health

HO oil contains a high percentage of monounsaturated fatty acid. This fatty acid family permits to **reduce the cholesterol** content in blood and to **struggle against hypertension** problems. HO oil is also rich in vitamin E and antioxidants which protect our cells.

Industry

HO oil has a better stability during the cooking than a classic oil therefore HO oil is very appreciated by agribusiness companies. HO oil is also frequently used in green chemistry companies and **can be used like bio lubricants, green ester and biofuels.**

Environment

Contrary to palm oil, which comes from far countries and which increases deforestation problems, **HO oil is produced in Europe** and doesn't require destruction of forests. Today, more and more farmers are launching in organic sunflower cultivation to answer a new demands from customers.

Clearfield® Plus
Production System for Sunflower

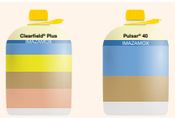
The Clearfield® Plus Production System for Sunflower

1. **Clearfield® Plus Hybrids**
2. **Clearfield® Plus Herbicide**
3. **Stewardship Program**

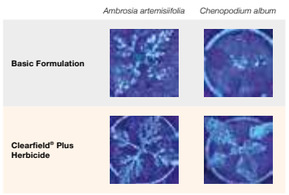
The Clearfield® Plus Herbicides

- Researchers and specialists have worked together to develop tailor made, complex herbicide solutions exclusively for the Clearfield® Plus Production System for Sunflower
- New formulations based on the need to provide better and more fl exible weed control to farmers
- Clearfield® Plus Herbicides deliver a consistently increased post emergence efficacy against broadleaf weeds, grasses and Orobanche
- This is based on better uptake, retention an adhesion

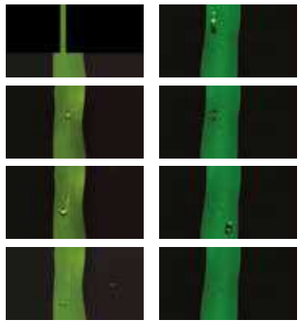
New Herbicide solutions for Clearfield® Plus



Herbicide Clearfield® Plus at the leaves of the target weeds*



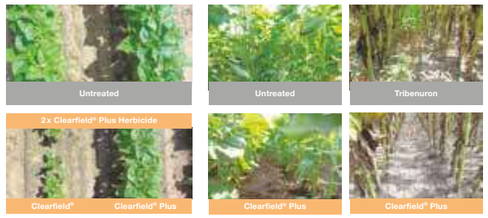
Improved plant adhesion of Clearfield® Plus Herbicides, reduced roll off*



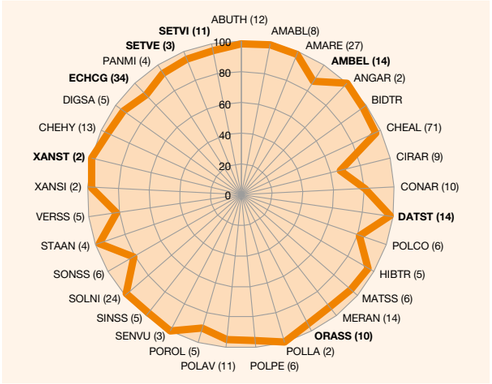
The Clearfield® Plus Production System for Sunflower – development and targets

- Excellent herbicide tolerance
- Robust and reliable weed control
- Flexibility
- Best genetics

Improved selectivity of Clearfield® Plus Hybrids, improved effi cacy from Clearfield® Plus Herbicides*



Clearfield® Plus Herbicides deliver high level efficacy towards important Sunfl ower weeds including grasses, *Ambrosia* and *Orobanche cumana**



*results and pictures derived from BASF research and development 2004–2015

BASF
We create chemistry

FMC An Agricultural Sciences Company

SUNFLOWER POST EMERGENCE HERBICIDE

TAKE THE HEAD OF THE EVOLUTION

MAS Seeds® hybrids are now available with Express tolerance.

Express™ SX®
herbicide

A UNIQUE AND MODERN BROAD-LEAVED WEED HERBICIDE TO MAXIMISE SUNFL OWER GROWTH SAFELY

USE PLANT PROTECTION PRODUCTS SAFELY AND WITH RESPONSIBLE CARE.
PLEASE ALWAYS FOLLOW THE LABEL WHEN APPLYING PLANT PROTECTION PRODUCTS.

EARLY | LINOLEIC

MAS 804G

A STAR IS BORN

- **YIELD POTENTIAL**
  in all conditions
- **EARLINESS**
  at flowering and at maturity
- **BROOMRAPE TOLERANCE**
  an ORO G profile

PRODUCT ID

Maturity:	Early
Oil Type:	Linoleic

CHARACTERISTICS

Flowering:	Early
Plant height:	Medium - Short
Head shape:	Slightly convex
Head position:	Slightly inclined
TKW:	45-55 g
Oil content:	44-45 %

AGRONOMY

Early vigor:	7
Lodging:	9
Drought tolerance:	8
Broomrape:	G
Mildew:	RM9
Phomopsis:	7
Sclerotinia (head):	7
Sclerotinia (stem):	9
Verticillium:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

GROWING RECOMMENDATIONS

	Optimal conditions	Limited conditions
Adaptation	++++	++++
Density (Grain Pl/ha)	65-70 000	50-60 000

MAS 804G has been developed to deliver high and secure top yields for early sunflowers areas under broomrape pressure.

It has been tested during two years in all MAS Seeds® R&D trial locations and the results are very impressive whatever cultivation conditions and weather conditions.

In addition, its ORO G presents an excellent disease and agronomic profile for maximum safety. **MAS 804G** is the best seller of early linoleic with broomrape tolerance market.

MID EARLY | LINOLEIC

MAS 920CP

MISTER YIELD

- **YIELD PERFORMANCE**
  unlock the potential
- **SECURITY OF POTENTIAL**
  to fill silos in all situations
- **HELIOSMART VARIETY**
  to ensure yield from seed to harvest

PRODUCT ID

Maturity:	Mid Early
Oil Type:	Linoleic
Herbicide trait:	Clearfield Plus

CHARACTERISTICS

Flowering:	Mid Early
Plant height:	High
Head shape:	Flat
Head position:	Straight
TKW:	55-65 g
Oil content:	43-45%

AGRONOMY

Early vigor:	8
Lodging:	9
Drought tolerance:	9
Broomrape:	E
Mildew:	RM9
Phomopsis:	8
Sclerotinia (head):	9
Sclerotinia (stem):	9
Verticillium:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

EARLY | LINOLEIC

MAS 83SU

TECHNICAL ADAPTABILITY IN EARLY GROUP

- **EARLINESS/YIELD POTENTIAL RATIO**
  adaptability in all territories
- **HIGH OIL CONTENT**
  to secure quality
- **FLEXIBILITY TO WEED CONTROL**
  to forget weed problems

PRODUCT ID

Maturity:	Early
Oil Type:	Linoleic
Herbicide trait:	Express SX

CHARACTERISTICS

Flowering:	Mid Early
Plant height:	High
Head shape:	Slightly convex
Head position:	Mid erected
TKW:	50-55 g
Oil content:	45-47 %

AGRONOMY

Early vigor:	8
Lodging:	7
Drought tolerance:	8
Broomrape:	E
Mildew:	RM9
Phomopsis:	9
Sclerotinia (head):	7
Sclerotinia (stem):	6
Verticillium:	7

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

AGROSTART® SUNFLOWER SEED APPLIED SOLUTION

AGRO START®

INNOVATIVE SUNFLOWER SEED CARE

FOR BETTER FIELD ESTABLISHMENT AND YIELD SAFETY

Biostimulant

+ Fungicide

AGROSTART®: MORE THAN A SEED TREATMENT, IT IS AN INNOVATIVE TECHNOLOGY!

Innovative formulation to boost and protect plants in all environments

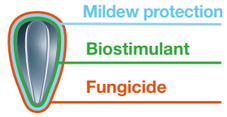
The innovative AGROSTART standard formulation for stronger and well protected seedling.

Two advanced formulations for environments with higher pest pressure, composed with the standard formulation and complementary solutions.

AGRO START®

STANDARD FORMULATION

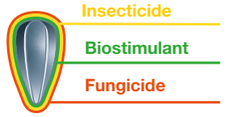
- **Biostimulants:** a new humic acid formulation to improve the absorption of nutrients available around seedling.
- **Fungicide:** prevents damage during the early growth phase from fungus and secure the emergence.
- **Mildew protection:** Possibility to treat with a mildew protection in accordance with the local regulation, to support genetic protection.



AGRO START® + INSECT

ADVANCED FORMULATION FOR SOIL INSECT PRESSURE

- **Biostimulant** and **fungicide** standard formulation.
- **Insecticide**: protects against the principal soil insects as wireworms.



Benefits at field establishment and harvest

Boost and protect the seedling for a better emergence:

- Quicker and more regular emergence
- Higher emergence rate in cold conditions
- Better roots exploration and nutrient absorption

Improve yield in all situations, especially in cold conditions at emergence:

- + 5% Yield in average *
- + 7% Yield in cold conditions at emergence*
- Better yield in more 80% of situations*

* Compared to standard treatment. Source: MAS Seeds® Research in Seeds Production Data

WINTER OILSEED RAPE

MAS Seeds® offers competitive winter oilseed rape hybrid portfolio covering most known segments in the market

- ALL MATURITIES
- CLASSIC HYBRID
- HERBICIDE TOLERANT
- CLUBROOT TOLERANT
- SAFETY+ GENETIC LABEL

	MATURITY & TYPE		USE AND CHARACTERISTICS						DENSITY &		ADAPTATION		AGRONOMY					DISEASE				
									Density at harvest, pl/m²		Adaptation											
VARIETY	Type	Flowering	Oil content	Protein content	GLS** content µmoles/g	Herbicide tolerance	TuVY Resistant	SAFETY+	Optimal conditions	Limited conditions	High-normal potential	Low potential	Early vigor	Stem Elonga-tion	Growth after winter	Pod shattering	Lodging	Phoma	Sclerotinia stem	Leaf ligth-ing spot	Dry stem	VARIETY
VESTAL CL	OGU-INRA	Early	42-44%	37-39%	15-17	Clearfield®	-	-	30-35	30-40	•••	••••	6	6	Early	8	7	7	8	7	7	VESTAL CL
SIMONA	OGU-INRA	Mid early	42-44%	34-37%	13-15	-	-	-	30-35	30-40	•••	••••	7	8	Mid-late	9	7	7	7	5	6	SIMONA
MIRANDA	OGU-INRA	Mid early	41-43%	34-37%	15-17	-	-	-	25-35	30-40	•••	••••	7	8	Early	9	8	7	8	8	9	MIRANDA
KOMBIA	OGU-INRA	Mid early	42-44%	34-36%	15 -17	-	-	◢	30-40	35-40	••••	•••	8	9	Mid-Early	9	8	8	7	7	7	KOMBIA
COLUMBIA	OGU-INRA	Mid late	42-44%	34-36%	17-19	-	-	◢	25-35	35-40	•••	••••	9	7	Mid-late	9	9	8	8	6	8	COLUMBIA
NEW DC2191*	OGU-INRA	Mid late	41-43%	36-38%	13-15	-	◢	◢	25-35	30-40	••••	•••	8	8	Mid-late	9	9	8	8	8	8	DC2191* NEW

*In registration process
**Glucosinolates
1-4 Sensitive | 4-5 Average | 6-7 Good | 8-9 Excellent

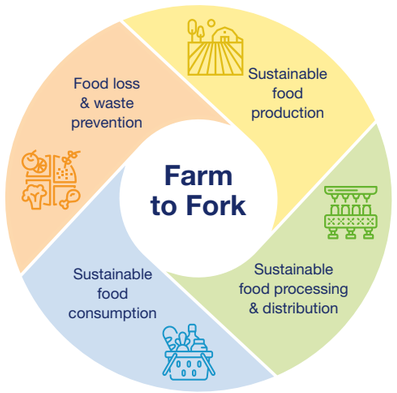
•••• Best results
••• Normal results
•• Limited performance
• Avoid

RESEARCHING AGROECOLOGICAL SOLUTIONS FOR OILSEED RAPE AT MAS SEEDS®

Farm-to-Fork European strategy (F2F), which is considered at the heart of the **Green Deal**, aims at **reducing** by 50%:
a) the overall use and risk of chemical pesticide;
b) the use of hazardous pesticides.

At the same time, the F2F strategy aims at reducing nutrient losses in the soil by at least 50%, while ensuring no deterioration in soil fertility. And this should **reduce the use of fertiliser**s by at least 20%.

ACT TOGETHER
FOR A CHANGING AGRICULTURE



Aligning with these F2F objectives, MAS Seeds® has launched a dedicated **research program for agroecological solutions** in oilseed rape (OSR). This research aims to boost rapeseed agroecosystem to ensure yield security while respecting the objectives of the European Green Deal and the new Common Agricultural Policy 2023-2027 (CAP).

Name of trials	Objective	How ?
SAFETY+	Limit use of insecticide in autumn.	Select hybrids with combined characteristic that mitigate impact of autumn insects on the yield.
Association of 2 hybrids	Limit use of insecticide in spring.	Associate the hybrid of interest (90%) with an earlier flowering one (10%) that will attract pollen beetles and thus reduce their impact on the yield of the hybrid of interest.
Companion plants	Limit use of insecticide in autumn and reduce nitrogen fertilisation by 30 kg/ha.	Associate OSR with legumes which will participate in its fertilization and have confusing effect on insects during the fall.
Nitrogen efficiency	Reduce nitrogen fertilization.	Select hybrids with a better use of nitrogen with less yield loss in low nitrogen situation.

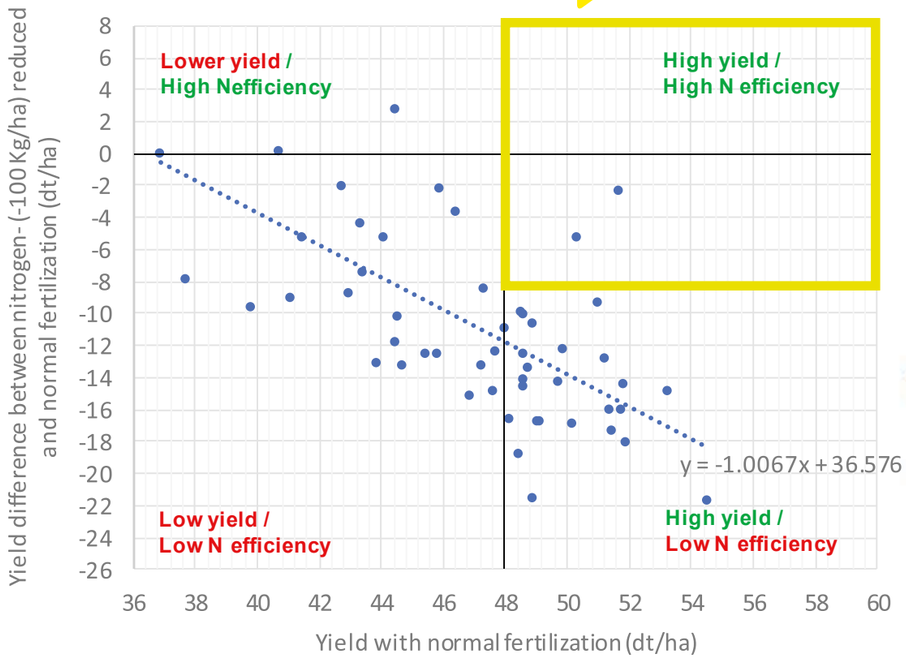

Use of companion plants


Association of 2 hybrids


SAFETY+ trials

"We select better nitrogen efficient hybrids with lower yield losses under reduced fertilisation."

Results of nitrogen trials 3 years 2 locations in France



Source: R&D Trials 2019-2022, France

SAFEGUARD THE YIELD OF YOUR RAPESEEDS

INSECT FOCUS

SAFETY+

- Better early vigor until 4 leaves stage
- Strong development before winter
- Higher tolerance to autumn insects

Global warming, drought, heat make sowing conditions increasingly difficult and uncertain for OSR. This has 2 main consequences:

- Later sowing in September results in difficult emergence
- Difficult growth at early stages which is leading to a more sensitive OSR to autumn insects, especially Flea Bettle.

As Europe is reducing and even stopping certain active insecticidal molecules, genetics becomes the 1st lever to mitigate the impacts on the yield. Indeed the SAFETY+ portfolio proposes varieties with combined characteristics that have most effect on this mitigation:

+5% of plants at 4 leaves stage*

Quick development to pass the insect sensitive stage as quickly as possible (before 4 leaves stage).

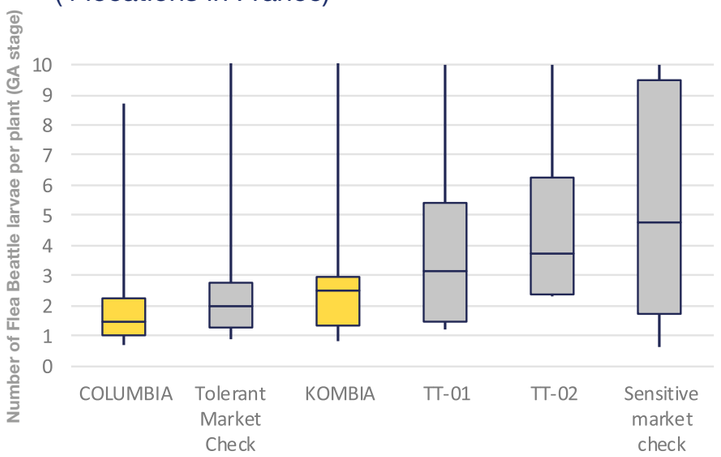
+10 to 20% of biomass volume before winter*

High biomass production before winter to avoid loss of plants even infected by Flea Beattle.

INFECTED PLANT

LOSS PLANT PER HECTAR

2022 & 2023 Berlese test: Counting of larvae on OSR
(4 locations in France)



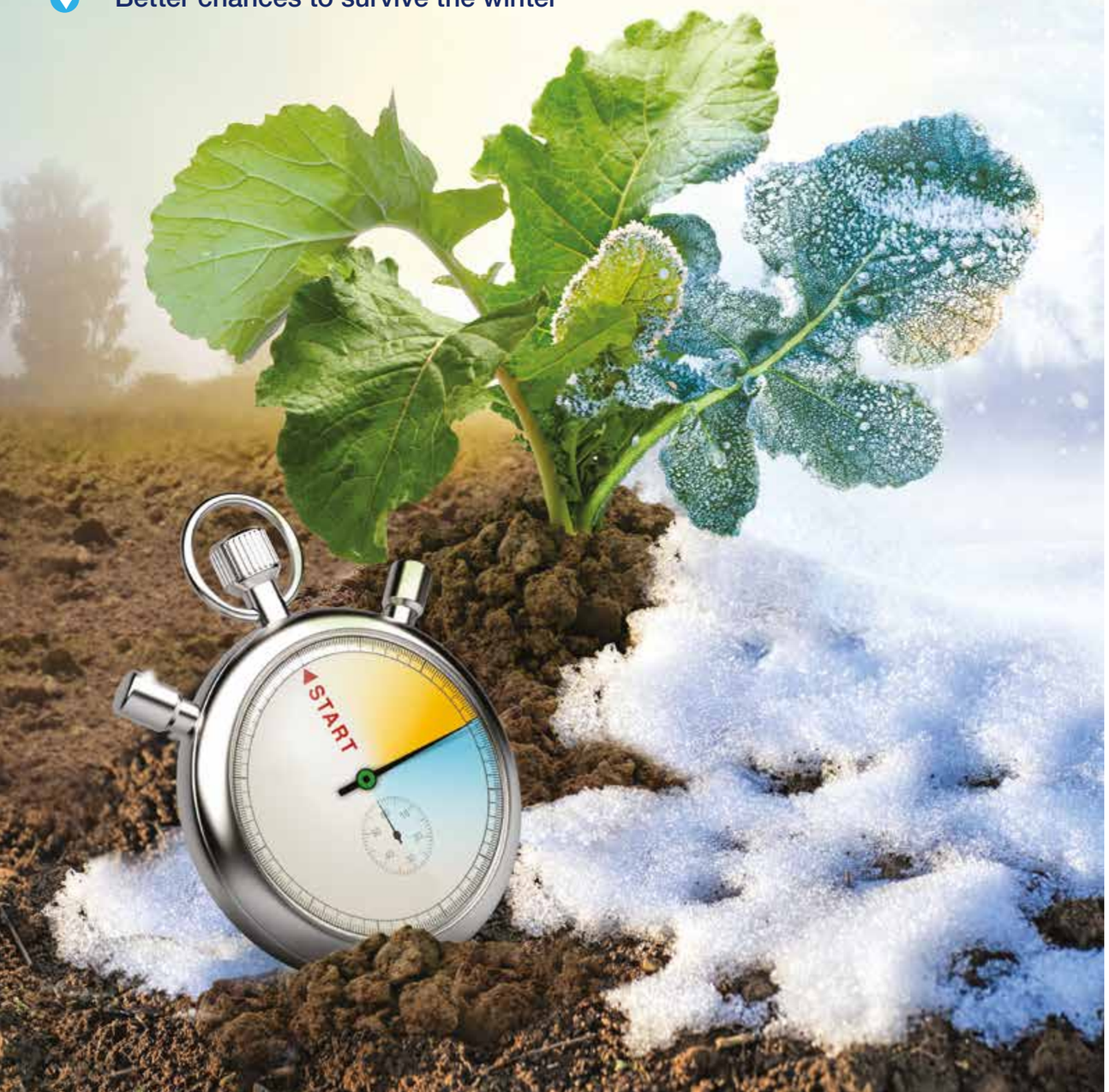
SAFETY+ hybrids have the best tolerance to autumn insect available on the market

SAFEGUARD THE YIELD OF YOUR RAPESEEDS

COLD FOCUS

SAFETY+

- Better early vigor until 4 leaves stage
- Strong development before winter
- Better chances to survive the winter



Global warming, drought, heat make sowing conditions increasingly difficult and uncertain for OSR. This has 2 main consequences:

- Later sowing in September which causes difficult emergence
- Difficult growth at early sensitive stages which exposes OSR to frost

In the context of late sowing, reaching the 8 leaves is critical to ensure maximal winter hardiness. The SAFETY+ portfolio proposes varieties with combined characteristics that gives the best odds to win this race against time:

+5% of plants at 8 leaves stage*

Good early vigor and quick development: key to reach 8 leaves stage as quickly as possible.

QUICK DEVELOPMENT

+0.2 to 0.5 kg/m² of biomass before winter*

Rapeseed biomass: protects the growing point from frost and therefore limits plant loss during winter.

MORE BIOMASS

SAFETY+ hybrids are the only one we recommend for late sowing

Under late sowing conditions, SAFETY+ hybrids have the best chance of reaching 8 leaves stage before winter and develop enough biomass to limit losses during the winter.

SAFE LATE SOWING

* : Source R&D MAS Seeds 2018 at 2020

MID EARLY | WOSR

SAFETY+

KOMBIA

DRO RESIST

A PROFITABLE HYBRID

- **YIELD REGULARITY**
  to achieve your objectives whatever the conditions
- **RESISTANT TO STEM ELONGATION**
  adapted for early sowing
- **EXCEL IN HIGH POTENTIAL**
  to valorize yours inputs

MATURITY & TYPE

Type:	OGU-INRA
Flowering:	Mid early

OIL CHARACTERITICS

Oil content:	42-44%
Protein content:	34-36%
GLS content:	15-17

DISEASES

Phoma:	8
Sclerotinia stem:	7
Leaf lighting spot:	7
Dry stem:	7

AGRONOMY

Early vigor:	8
Stem elongation:	9
Growth after winter:	Mid-early
Pod shattering:	9
Lodging:	8

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

GROWING RECOMMENDATIONS

	Optimal conditions	Limited conditions
Adaptation	++++	+++
Density at harvest (pl/m2)	30-40	35-40

KOMBIA demonstrates an outstanding yield regularity in our network all over Europe. It especially excel in high yield situations. With its good early vigor and very good stem elongation resistance, KOMBIA is particularly adapted for early sowing.

MID LATE | WOSR

SAFETY+

COLUMBIA

DRO RESIST

THE SAFETY+ HYBRID

- **SAFETY+**
  to mitigate impact of insects
- **EXCELLENT YIELD POTENTIAL**
  above market references
- **A ROBUST HYBRID**
  good early vigor and disease tolerance

MATURITY & TYPE

Type:	OGU-INRA
Flowering:	Mid late

OIL CHARACTERITICS

Oil content:	42-44%
Protein content:	34-36%
GLS content:	17-19

DISEASES

Phoma:	8
Sclerotinia stem:	8
Leaf lighting spot:	6
Dry stem:	8

AGRONOMY

Early vigor:	9
Stem elongation:	7
Growth after winter:	Mid-late
Pod shattering:	9
Lodging:	9

1-3 sensitive | 4-6 medium – good | 7-9 tolerant | excellent

GROWING RECOMMENDATIONS

	Optimal conditions	Limited conditions
Adaptation	+++	++++
Density at harvest (pl/m2)	25-35	35-40

COLUMBIA is the ideotype of SAFETY+ hybrid: Among best early vigor in the market with strong biomass production before winter COLUMBIA has best characteristics to mitigate impact of insects in autumn.

SOYBEAN

Increasing protein and feed autonomy is a way to reduce the negative impacts on the environment, manage economic and climatic risks thus improve the sustainability of the farms. Today most European livestock farmers depend on imported animal feed protein such as soybeans. About 75% of the global soybean output is used for animal feed and EU is the number two importer of soybean, mostly from US and Brazil. This high amount of import is coupled with high risk factors such as fluctuating prices, availability, gas emissions, GMO content.

In addition to their crucial role in protein autonomy for cattle farmers, soybeans are excellent nitrogen fixators which makes them them excellent choice of crop for agroecological farming systems.

In our efforts to contribute for agroecological shift in faming we have recently enlarged our soybean portfolio and introduced in several countries in Europe to support local protein sector.

Today MAS Seeds® offers varieties for various uses and maturities:

- ANIMAL FEED
- HUMAN CONSUMPTION
- MATURITIES 00 / 0 / I

Basic cultivation best practices

Sowing

In Europe soybean sowing should be done in spring when the soil temperatures reaches 10°C followed by a consistent increase in soil temperature. Ideal sowing depth is 3-4 cm, whereas it should be adapted for eary sowing in colder soils at 2 cm.

Distance between the rows:

- 18 – 30 cm for 000 maturity groups
- 18 – 50 cm for 00 maturitiy groups
- 25 – 60 cm for 0 and II

Innoculation

Soybeans must be innoculated with Bradyrhizobium bacteries so that they can produce nodules for nitrogen fixation.

Weed Control

The ideal way to control weeds is through crop rotation and tillage:

- Favour long and diversified rotations, with alternating winter crops and spring crops to hinder weed cycles.
- In the event of major difficulties linked to grasses (ryegrass, foxtails, crabgrass), plow every 3 to 4 years to reduce the seed stock and limit crop emergence rates.
- In rotation with maize, soy is an opportunity to manage annual and perennial grasses (quack grass, Aleppo sorghum) via foliar herbicides.

Harvest

In European conditions the harvest occur during September – October. The indicators that the field is ready to harvest are:

- The plant lost its leaves, the stem is dry and yellow
- The grains can easily be removed from the pods. When you press the pods, the cracking sound can be heard
- The grains are hard and difficult to press with the finger nails.

		CHARACTERISTICS				
	VARIETY	Maturity group	Protein	Oil	Color of hilum	Color of flowers
NEW	ALBENGA	00	42-43%	Medium	Yellow	Purple
	SONJA	0,5	39-41%	Medium	Brown	Purple
	CRIMILDE	1-	37-39%	High	White	Purple
NEW	ARTESIA	1-	38-40%	Medium-High	Brown	Purple

AGRONOMY							
Early vigor	Type of growth	Ramification capacity	Soil coverage	Height of 1st pod	Lodging	Shattering resistance	VARIETY
7	Indeterminated	8	8	Medium	7	8	ALBENGA NEW
6	Half-indetermi-nated	7	7	Medium	8	8	SONJA
8	Half-indeterminated	9	9	High	8	9	CRIMILDE
8	Half-Indetermi-nated	9	9	Medium-High	7	8	ARTESIA NEW

GROUP 00 NEW

ALBENGA

THE PROTEIN MAKER

- **EXCELLENT YIELD**
  in the 00 group
- **HIGH PROTEIN CONTENT**
  42 – 44%
- **ADAPTABLE USE**
  end of 00 group with yield potential

CHARACTERISTICS

Maturity:	End of 00 group
Flower colour:	Purple
Hilum colour:	Yellow
TKW:	Medium
Protein content:	42-44 %
Oil content:	Medium

AGRONOMY

Plant height:	Medium-high
First pod height:	Medium
Growth type:	Indeterminate
Soil coverage:	8
Ramification capacity:	8
Starting vigor:	7
Tolerance to water stress:	7
Tolerance to Sclerotinia:	7

1-3 sensible I 4-6 average - good I 7-9 good to excellent

RECOMMENDATIONS

Plant density:	55-60 plants /m²
Sowing depth:	3-4 cm

Sowing period adaptation			
EARLY	OPTIMAL	LATE	2nd CROP
++++	+++	++	+++

YIELD PERFORMANCE

French registration results: 105.9%*

*Official result from French Ministry of Agriculture in 2019

Commercial bag of 125 00 kernels

PRE-INOCULATION:

The shelf life of the inoculum is 80 to 90 days with a storage temperature of 18°C. Lower temperature storage has a positive impact on the lifespan of rhizobia on seeds. We recommend a temperature below 25°C for storage and transport of pre-inoculated seeds.

GROUP 1- NEW

ARTESIA

TOP YIELD LEVEL

- **EXCELLENT YIELD POTENTIAL**
  suitable for intensive farming
- **VERY GOOD RAMIFICATION CAPACITY**
  covers very well the soil to limit weeds development
- **VERY GOOD STARTING VIGOR**
  to ensure a perfect start

CHARACTERISTICS

Maturity:	1-
Flower colour:	Purple
Hilum colour:	Brow
TKW:	Medium
Protein content:	38-40 %
Oil content:	Medium-high

AGRONOMY

Plant height:	Medium-high
First pod height:	Medium-high
Growth type:	Half-indeterminate
Soil coverage:	9
Ramification capacity:	9
Starting vigor:	8
Tolerance to water stress:	7
Tolerance to Sclerotinia:	7

1-3 sensible I 4-6 average - good I 7-9 good to excellent

RECOMMENDATIONS

Plant density:	50-55 plants /m²
Sowing depth:	3-4 cm

Sowing period adaptation			
EARLY	OPTIMAL	LATE	2nd CROP
++++	+++	+	-

YIELD PERFORMANCE

Austrian registration results 2021: 107.0%*
(average yield of location 4,00 t/ha)

*Official result from Austrian Ministry of Agriculture in 2021

Commercial bag of 125 00 kernels

PRE-INOCULATION:

The shelf life of the inoculum is 80 to 90 days with a storage temperature of 18°C. Lower temperature storage has a positive impact on the lifespan of rhizobia on seeds. We recommend a temperature below 25°C for storage and transport of pre-inoculated seeds.

ALFALFA: MAS ALFA PRODUCTS PORTFOLIO: ENSURE STABILITY AT HIGH PERFORMANCES

MAS ALFA PRODUCT PORTFOLIO: The origin & MAS Seeds® alfalfa R&D network inauguration in 2018

The choice of alfalfa seeds is a very important decision for farmers as it is cultivated for long term hay production (from 3 to 5 years).

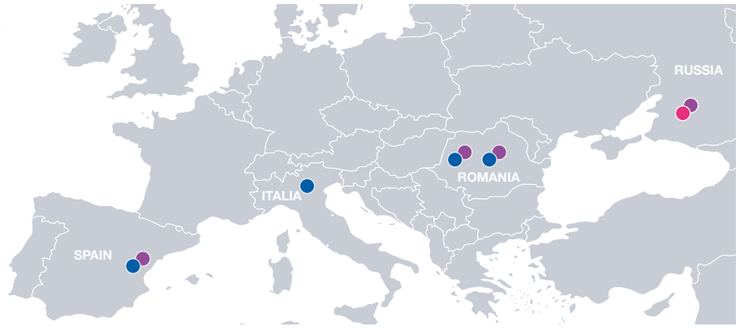
Over the past 5 years, alfalfa seed production has been regularly impacted by climate disruption (droughts, irregular and important rainfalls at harvest) regularly leading to seed shortages for certain varieties. In this context it is a challenge to ensure the exact varietal composition of the product for all customers.

Our priority is to deliver high performant products whatever their varietal compositions. To answer this challenge, MAS Seeds® has selected a pool of high performing varieties.

MAS Seeds® has therefore set up an alfalfa R&D network in several countries (Romania, Russia, Spain and Italy). The main objective is to evaluate and select the best alfalfa varieties.

MAS Seeds Alfalfa R&D network

- Dormancy 2-3
- Dormancy 4-5
- Dormancy 6-8



The research consists of a meticulous evaluation and selection of alfalfa varieties based on the individual performances (yield, protein content) and agronomic characteristics such as vigor after sowing, winter hardiness, start of growth after winter. The ability of varieties to combine in the field in associations to maximize and stabilize production is carefully tested.

MAS Seeds® has therefore set up an alfalfa R&D network in several countries (Romania, Russia, Spain and Italy). The main objective is to evaluate and select the best alfalfa varieties.

Variety portfolio 23-24

DORMANCY	NAME
2-3	LUZELLE, LIMORY
4-5	GALAXIE, NUTRIX, RIANNA
6-7	OCCITANE, LZ0620*
7-8	TEQUILLA, SPEEDA

	CHARACTERISTICS						PERFORMANCES					FODDER QUALITY		AGRONOMY			DISEASES & PESTS				RECOMMENDATIONS		
PRODUCT	Dormancy	Composition	Duration	Main Harvest Method	Main use	Dehydration	Yield potential	Spring productivity	Summer productivity	Autumn productivity	All year long productivity	Protein content	Digestibility	Vigor after sowing	Lodging	Winter-hardiness	Leaf spot	Verticilium wilt	Anthracnose	Nematodes	Sowing rate kg/ha	Irrigation	PRODUCT
PURE VARIETY																							**PURE VARIETY**
MAS ALFA 4	4	GALAXIE, NUTRIX, RIANNA	3-6 years	Cutting	Silage, Wrapping, Hay	yes	8	9	8	7	8	8	9	8	9	Very winter hardy	8	7	8	9	20-25 kg/ha	-	**MAS ALFA 4**
MAS ALFA 6	6	OCCITANE, LZ0620*	3-6 years	Cutting	Silage, Wrapping, Hay	yes	8	8	8	8	8	9	9	9	8	Winter hardy	9	7	8	9	20-25 kg/ha	-	**MAS ALFA 6**
MAS ALFA 8	8	TEQUILA, SPEEDA	3-6 years	Cutting	Silage, Wrapping, Hay	yes	9	8	9	9	8	7	8	7	9	Moderately winter hardy	8	8	7	8	20-25 kg/ha	Recommended	**MAS ALFA 8**
ASSOCIATION OF 2 VARIETIES																							**ASSOCIATION OF 2 VARIETIES**
MAS ALFA DUO 4	4	55% D4 Variety 45% D4 Variety	3-6 years	Cutting	Silage, Wrapping, Hay	yes	8	9	8	7	8	9	8	8	9	Very winter hardy	8	8	8	9	20-25 kg/ha	-	**MAS ALFA DUO 4**
MAS ALFA DUO 6	6-7	55% D6 Variety 45% D7 Variety	3-6 years	Cutting	Silage, Wrapping, Hay	yes	8	8	9	8	8	9	9	9	8	Winter hardy	9	8	8	9	20-25 kg/ha	-	**MAS ALFA DUO 6**
MAS ALFA DUO 8	4-6	55% D8 Variety 45% D7 Variety	3-6 years	Cutting	Silage, Wrapping, Hay	yes	9	8	9	9	8	8	9	7	9	Moderately winter hardy	8	9	7	8	20-25 kg/ha	Recommended	**MAS ALFA DUO 8**
ASSOCIATION OF 4 VARIETIES																							**ASSOCIATION OF 4 VARIETIES**
MAS ALFA QUATTRO	4-5	25% D3 Variety 25% D4 Variety 25% D4 Variety 25% D6 Variety	3-6 years	Cutting	Silage, Wrapping, Hay	no	8	9	9	9	9	9	9	8	9	Very winter hardy	9	9	9	9	20-25 kg/ha	-	**MAS ALFA QUATTRO**

*In registration process

AGROSTART®+ MYCO ALFALFA SEED APPLIED INNOVATION

AGROSTART®+ MYCO: MORE THAN A TREATMENT, IT IS AN INNOVATIVE SEED APPLIED SOLUTION!

2 innovative formulations to boost your alfalfa seeds

The innovative AGROSTART® standard formulation includes inoculation and micro-nutrition to improve field establishment, yield and the quality.

The advanced formulation **AGROSTART®+ MYCO** has mycorrhization in addition to boost the alfalfa crop all along the vegetation.

ACTION	COMPONENT	BENEFITS	AGRO START	AGRO START + MYCO
INOCULATION	Rhizobium Meliloti	• Ensure development of nodosity • Higher yield • Higher protein fodder	✓	✓
MICRO-NUTRITION	Major and trace elements	• Improve alfalfa establishment • Higher yield for 1st cut	✓	✓
MYCORHIZATION	Glomus intraradices	• Higher yield • Better regularity over time & space • Higher stress resistance and better sustainability		✓
			+6,3% protein yield **+4%** crop yield*	**+11,5%** protein yield **+6,5%** crop yield*

* MAS Seeds & CERIENCE R&D data, trials conducted on 4 locations (France, Spain, Poland, Romania) comparison to untreated seeds

Opt for an advanced formula with MYCORHIZATION

AGROSTART®+ MYCO with **MYCORHIZATION** enhances the nutrients absorption ability of alfalfa and brings therefore following benefits:

- Better stress resistance (salt, drought, cold)
- Higher and more stable yield over 4 years of cultivation
- Better fodder quality, higher protein content
- Better vigour and growth

THE SEED APPLIED INNOVATION FOR ALFALFA

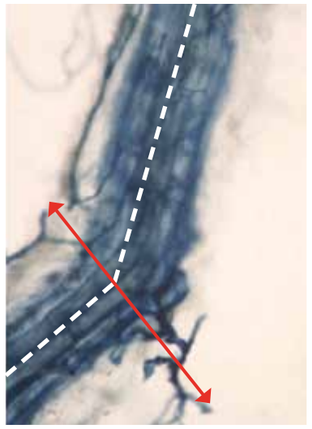
What is AGROSTART®+ MYCO?

AGROSTART®+ MYCO is a new seed applied solution with a triple mode of action:

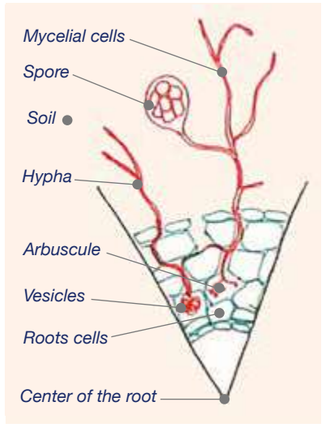
1. Inoculation
2. Micronutrients
3. Mycorrhization

AGROSTART+ MYCO completes AGROSTART seed application with *Glomus intraradices* fungi that creates the mycorrhiza- plant symbiosis.

The symbiosis take place in the soil between the fungi and the alfalfa roots. It is stimulated by the presence of rhizobium and take around 1 year to set up and provides its positive effects.



Alfalfa roots with mycorhizae under the microscope



Scheme of cross section of alfalfa roots with mycorhizae

What are the benefits of mycorrizhal symbiosis for alfalfa?

The symbiosis between *Glomus intraradices* and alfalfa benefits for both of the species:

- Alfalfa provides food and shelter for the fungus: carbon compounds (=simple sugars), some amino-acid and shelter for the fungi which ensure its survival and growth.
- In return the fungus shares its roots which greatly enhances the alfalfa's ability to absorb nutrients, especially phosphorus (N, P, K, Ca, Mg, S, Cu, Zn, Mn, Fe) and also water. Alfalfa requires high quantities of phosphore and the mycorhyze increase phosphore intake about +300% (Jansa et al. 2008 New Phytologist).

What are the benefits for farmers?

The enhanced absorption ability of alfalfa with AGROSTART+ MYCO produces following benefits:

- Better stress resistance (salt, drought, cold)
- Higher and more stable yield over 4 years of cultivation
- Better fodder quality, higher protein content
- Better vigour and growth
- Higher stability of soil structure

Different seed applications testedon MAS ALFA DUO4	Average dry matter yield	Average % TNC*/kg/DM	Protein yield/ha	Protein added value/ha Soybean cake 350 €/t
Untreated (control)	**100**% 12,4 t/ha	23,1%	**100**% 2 864 kg	**0** €
S.A.S READY	**100**% 12,4 t/ha	23,6%	**102,2**% 2 926 kg	**+144** €
AGRO START	**104**% 12,9 t/ha	23,6%	**106,3**% 3 044 kg	**+420** €
AGRO START+MYCO	**106,5**% 13,2 t/ha	**24,2**%	**111,5**% 3 194 kg	**+771** €

* TNC= Total Nitrogen Content MAS Seeds & CERIENCE R&D data, trials conducted on 4 locations (France, Spain, Poland, Romania)

SILAGE | HAY | WRAPPING

MAS ALFA DUO 4

THE REFERENCE TO SECURE YIELD IN EVERY CONDITIONS

- **OUTSTANDING YIELD**
  through a symbiosis between 2 varieties
- **RELIABILITY FOR YIELD AND QUALITY**
  with a high disease tolerance
- **EXCELLENT IN PROTEIN AND DIGESTIBILITY**
  resulting a high value forage harvest

COMPOSITION & USE

2 varieties (dormancy 4-5):	mix of 55% and 45%
Duration:	3-6 years
Main harvest method:	cutting
Main use:	silage, wrapping, hay
Dehydration:	yes

PERFORMANCES

Yield potential:	8
All year long productivity:	8

DISEASES & PESTS

Leaf spot:	8
Verticiium wilt:	8
Anthracnose:	8
Nematodes:	9

FODDER QUALITY

Protein content:	9
Digestibility:	8

SOWING DENSITY

Sowing rate: 20-25 kg/ha

AGRONOMY

Vigor after sowing:	8
Lodging:	9
Winter-hardiness:	very winter hardy

1-3 sensible I 4-6 average - good I 7-9 good to excellent

PACKAGING **25 kg**

SILAGE | HAY | WRAPPING

MAS ALFA DUO 6

SECURE HIGH YIELD AND QUALITY IN EVERY CONDITIONS

- **A HIGH YIELD POTENTIAL**
  in every condition thanks to the combination of two varieties
- **AN OUTSTANDING QUALITY**
  due to a very good protein content and digestibility
- **HIGHLY RESISTANT TO NEMATODE**
  and anthracnose

COMPOSITION & USE

2 varieties (dormancy 6-7):	mix of 55% and 45%
Duration:	3-6 years
Main harvest method:	cutting
Main use:	silage, wrapping, hay
Dehydration:	yes

PERFORMANCES

Yield potential:	8
All year long productivity:	8

DISEASES & PESTS

Leaf spot:	9
Verticiium wilt:	8
Anthracnose:	8
Nematodes:	9

FODDER QUALITY

Protein content:	9
Digestibility:	9

SOWING DENSITY

Sowing rate: 20-25 kg/ha

AGRONOMY

Vigor after sowing:	9
Lodging:	8
Winter-hardiness:	winter hardy

1-3 sensible I 4-6 average - good I 7-9 good to excellent

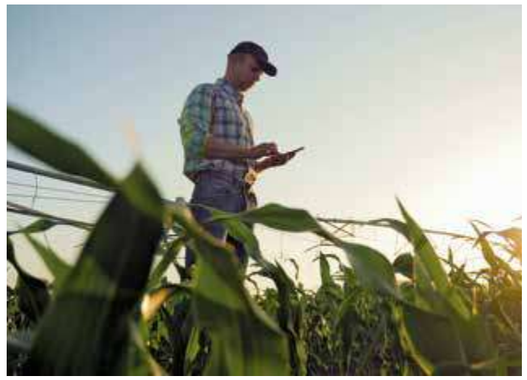
PACKAGING **25 kg**

AGRO-SERVICES

Through our ambition **«Act together for a changing agriculture»**, MAS Seeds® aligned with the European Commission directives to reduce by at least 55% by 2023 greenhouse gases. This sustainability ambition is not only translated by an evolution of our product offer but also by an Agro-Services offer.

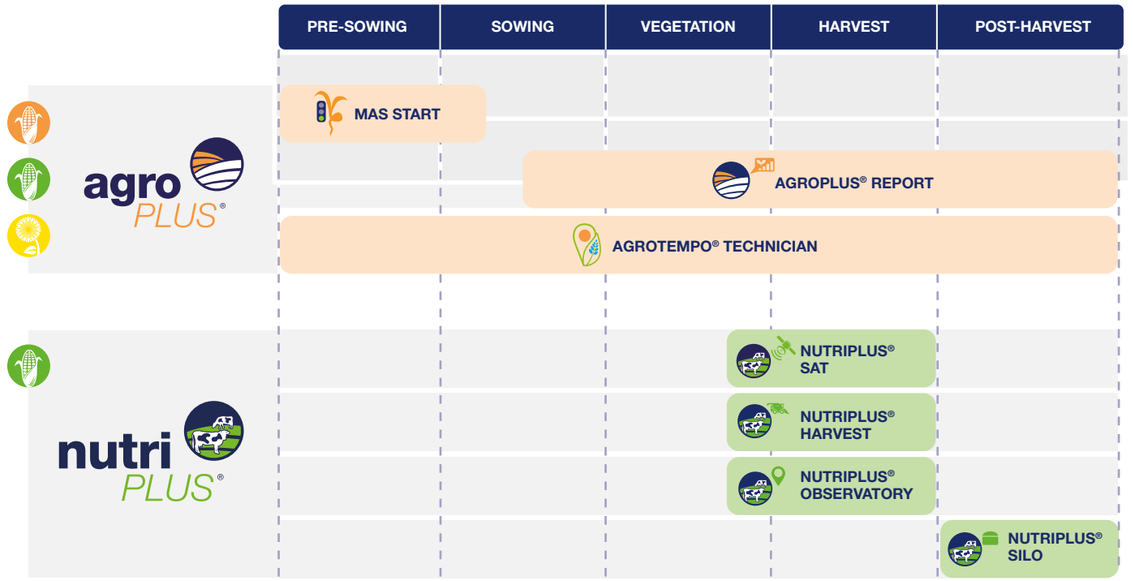
Our Agro-Services offer aims at supporting farmers in the process to adapt their crop practices and make them more sustainable. Furthermore through Agro-Services **we strengthen our relationship with our customers on the field to help them take the best decisions all along the campaign, optimize their crop practices and improve their profitability.**

New technologies in agriculture allow to propose models and services increasingly precise, accessible and simple to use for farmers. Agro-Services we propose are based on the new technologies and adapted to different types and needs of customers, whether they are farmers or distributors, whether they grow maize or sunflower, or other crops from sowing to harvest.



AGROPLUS® and NUTRIPLUS®:

- **AGROPLUS® Services** are dedicated to all field crop producers to increase their yields in a sustainable way. The agro-services support decision for most of MAS Seeds® crops; **grain or silage maize, sunflower, rapeseed and alfalfa.**
- **NUTRIPLUS® Services** help dairy farmers to get forage autonomy and increase their nutrition efficiency. The services provides additional diagnostics and decision support for **silage maize** growers.



SOW AS SOON AS POSSIBLE, AS LATE AS NECESSARY

A correct sowing contributes to 60% of the crop yield. MAS Seeds®, through the service MAS START, helps farmers in taking sowing time decision with a peace of mind. The service relies on agronomic knowledge as well as agro-weather expertise, and your seeds against weather related emergence losses.

User:	
Service:	
Crops:	

Maximize your yield by improving your sowing

An early sowing, if the conditions are favourable, contributes to yield optimisation thanks to:

- longer crop cycle
- fast and homogeneous emergence
- lower water stress during flowering.

In average, an early sowing **increases grain maize yield by 6 t/ha.**

A personalised service at field level

Thanks to our **agronomic knowledge** of seeds and our **agro-weather expertise**, we supervise fields during the sowing period to advise the best personalised sowing window. This forecast is made possible thanks to the following of different key agro-weather parameters specific for sowing: soil temperature, dynamic of emergence, frost risk, cumulative rainfall etc. When sowing conditions become favourable, the farmer receives an SMS and an email with sowing alerts:

1

PRE-START ALERT

Alert within the 10 days prior to the 1st favourable sowing window: «Sowing conditions will be soon favourable»

2

START ALERT

Alert at the beginning of the favourable sowing window: «Start sowing today»

A service which secures seed emergence

EMERGENCE INSURANCE*

If sowing is realised in the 7 days after the start alert and emergence losses** are observed

→ **FREE SEEDS for resowing**

*Available only in selected countries for maize and sunflower seeds.
**Emergence losses: maize > 20%; sunflower > 30%

agro PLUS® REPORT

REACH THE BEST OUT OF OUR VARIETIES WITH OUR AGRONOMIC EXPERTISE

AGROPLUS® Report consists of a complete analysis of your field with cultural advices in order to optimise your crop operations and reach the yield potential of MAS Seeds® varieties. The reports are created by your MAS Seeds® technician and sent to you by email 3 times in the vegetation.

User:	
Service:	
Crops:	

Optimise yields by improving crop operations

Crop yield can be explained at **54%** by crop operations: sowing time or density, soil preparation, fertilisation, harvest, etc.

To optimise crop practices, it is necessary to understand and analyse the specific conditions of the field (soil, weather, constraints…) and make the most adapted crop practice choice.

Factors influencing yield* (%)

54% Crop practices
27% Weather
19% Varieties

* Source: University of Illinois Crop Physiology science

Personalised agronomic reports

3 agronomic reports are sent by email in pdf at 3 key periods of the crop cycle:

1. post-emergence
2. post-flowering
3. post-harvest

These 3 reports combine field observations following your MAS Seeds® technician visit and agro-weather analyses taking into account the field conditions:

OBSERVATIONS

Notes and pictures of the field taken during visits of your MAS Seeds technician.

CROP OPERATIONS

Summary of the field crop operations: sowing date, density, treatment, etc.

AGRO-WEATHER INDICATORS

Specific indicators of the analysed period are integrated into the reports to understand the observations made. For example: sowing conditions, weather indicators for a specific physiological period, etc.

PERSONALISED ADVICES

Your MAS Seeds technician adds personalised advices to your report based on the previous elements analysed before.

agroTEMPO®
TECHNICIAN

DIGITAL CROP MONITORING FOR AGRONOMISTS

AGROTEMPO® Technician gives to the team of technicians access to all modules of AGROTEMPO: a digital tool to follow, anticipate and optimise crop operations from sowing to harvest for maize, sunflower, oilseed rape and alfalfa.

User:
Service:
Crops:

Input field data from sowing to harvest

AGROTEMPO® is the tool used by technicians and agronomists during customer visits on the field to rapidly and simply input field data, visualize and analyze all data collected.

It give a **complete and detailed field overview and farmer situation** to help the technician to give personalized advices.

INPUT

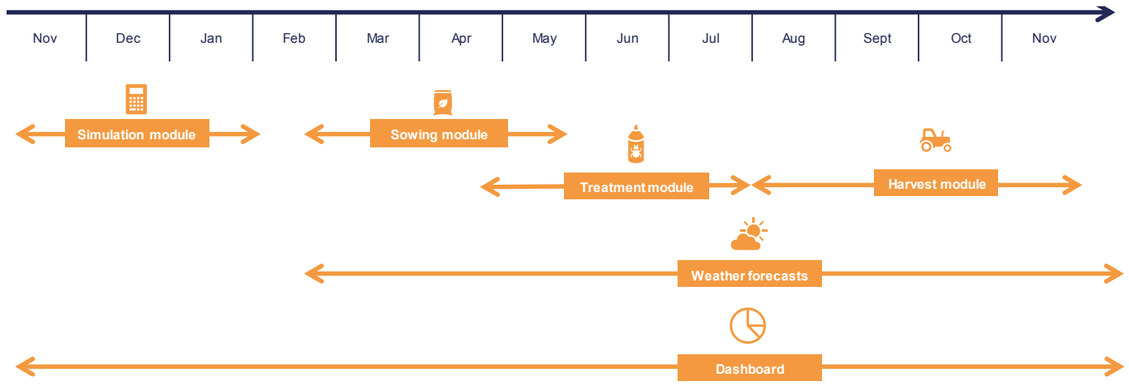
- Crop operations from sowing to harvest
- Fields observations with notes and pictures
- Adapted for both commercial fields and trials

VISUALIZE AND ANALYSE

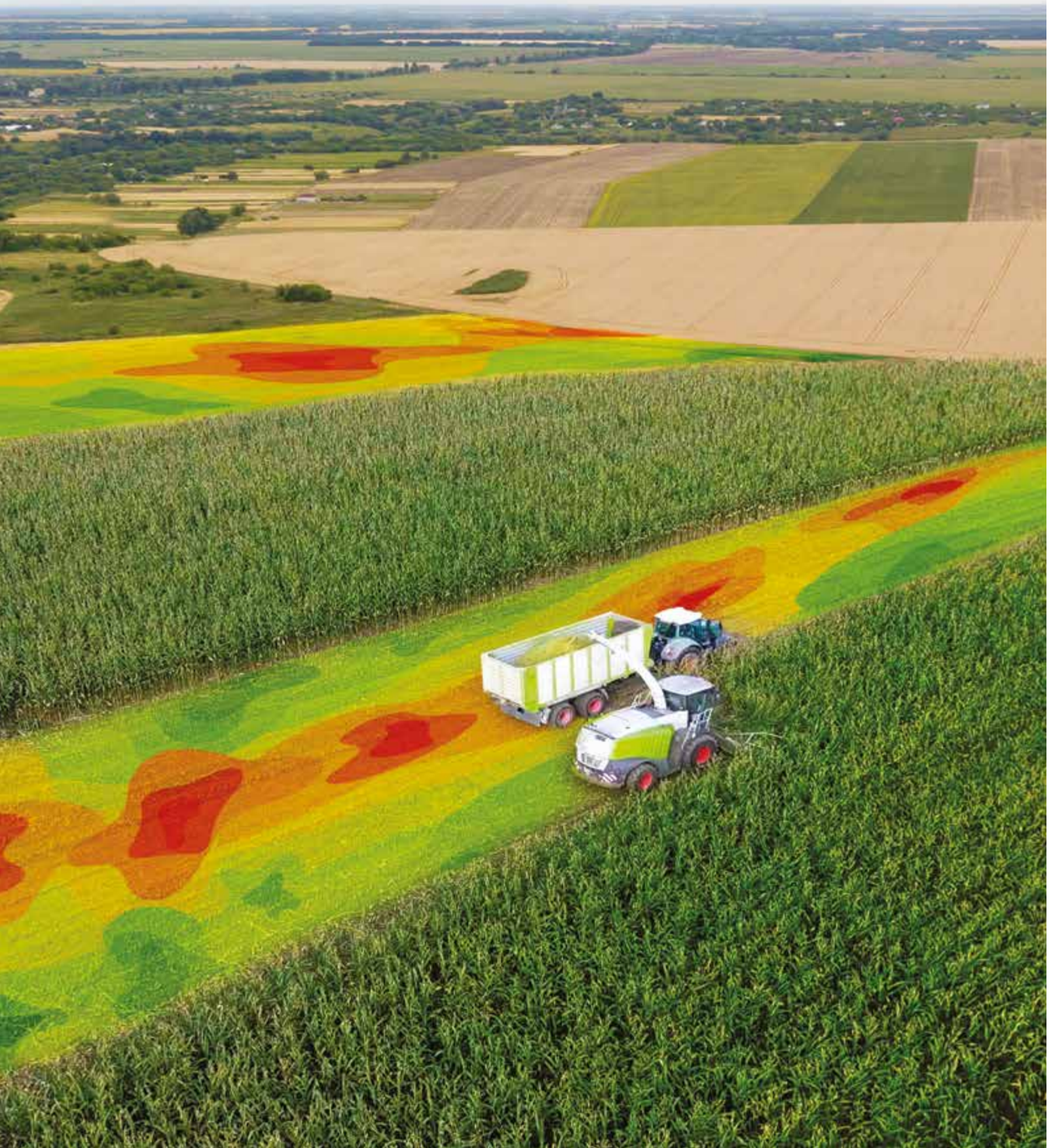
- Data visualisation interface
- Summary of indicators to follow the campaign advancement
- Data export

Qualitative agro-weather modules

Some agro-weather modules are also available all along the campaign to help technicians to take decision during different crop periods. Combined with the collected field data it helps anticipating and optimising crop operations. The modules combines MAS Seeds agronomic knowledge of seeds and agro-weather expertise.



HIGH QUALITY SILAGE BY SATELLITE PRECISION



NUTRIPLUS® Sat service is the association of satellite image technology and MAS Seeds® agronomic knowledges to follow and anticipate the percentage of dry matter evolution in silage maize to optimize harvest and silo quality.

User:	
Service:	
Crops:	

Define your harvest date to optimise silage quality

Two out of three farmers do not harvest at the right stage: **50 to 250€/ha losses because of harvest at the wrong stage.**

Silage harvest can not be improvised, it needs to be precise.

Benefit from advanced satellite technology

The satellite technology answers to theses issues with the following characteristics:

- **Real-time imagery**
- **High Frequency**, new updated image is available every 10-15 days
- **High-resolution imagery**

nutri PLUS® SAT

Plant Quality + Harvest Quality + Fermentation Quality

Silage Quality

Receive precise silage harvest advice and personalized report

NUTRIPLUS® SAT Service provide **regular customer reports from 23% DM until harvest** following these characteristics:

1. **Observe** %DM field map of the current date
2. **Anticipate** %DM forecast field maps
3. **Act** Best harvest period recommendation
4. **Optimize** In-field and field harvest advices

nutri PLUS® HARVEST

HIGH QUALITY SILAGE BY IN-FIELD DIAGNOSTIC

NUTRIPLUS® Harvest service helps to optimise harvest quality by forecasting the best harvest window based on the plant analysis from on your field.

User:	
Service:	
Crops:	

Define your harvest date to optimise silage quality

Harvest at the right date the silage maize is a key objective for dairy farmers. It's the guarantee to **harvest the best feed value and to have a good conservation on the silo** because 2 out of 3 farmers do not harvest at the right stage in silage.

A bad silage quality management can lead to **50** to **250 €/ha losses** or **4000/silo*.**

*1 ton of dry matter costs about 100 € to produce (average in France)

nutri PLUS® HARVEST

Plant Quality + Harvest Quality + Fermentation Quality

Silage Quality

Benefit from infrared technology

The XNIR or AGRINIR sensor measures the dry matter (DM) percentage of silage maize directly on the field:

- **Measure:** Direct plant measure
- **Precision:** Infra-red technology
- **MAS Seeds® expertise**: Specific MAS Seeds® calibration on green maize plant

Receive in field diagnostics & advices

Our MAS Seeds® expert makes a **diagnostic of your plants** thanks to a **high precision sensor**:

1. **OBSERVE**
Measure %DM content of your silage maize using infrared sensor directly on the field

2. **ANTICIPATE**
Forecast of the field %DM evolution

4. **ADVISE**
Recommend the best harvest period

With NUTRIPLUS® Observatory, agronomists can easily and rapidly inform and communicate to their farmers or technicians about the silage forecast harvest dates in their region.

User:	
Service:	
Crops:	

Inform your farmers close to harvest

Harvest date in silage in one of the key parameter to get a qualitative and quantitative silage. We observe that 2 out of 3 farmers do not harvest at the right stage in silage.

A bad silage quality management can lead to **50** to **250€/ha losses** or **4000€/silo***. So, a key issue for a dealer is to be able to evaluate his farmers situation on his territory and inform them about harvest.

nutri PLUS® OBSERVATORY

Plant Quality + **Harvest Quality** + Fermentation Quality

Silage Quality

BETTER UNDERSTAND
View variety of indicators for silage maize growers in your region (location, weather, sowing date, maturity group) and anticipate harvest date.

BETTER COMMUNICATE
Comunicate easily and rapidly to your technicians and farmers on harvest forecasts dates.

*1 ton of dry matter cost about 100 € to produce (average in France)

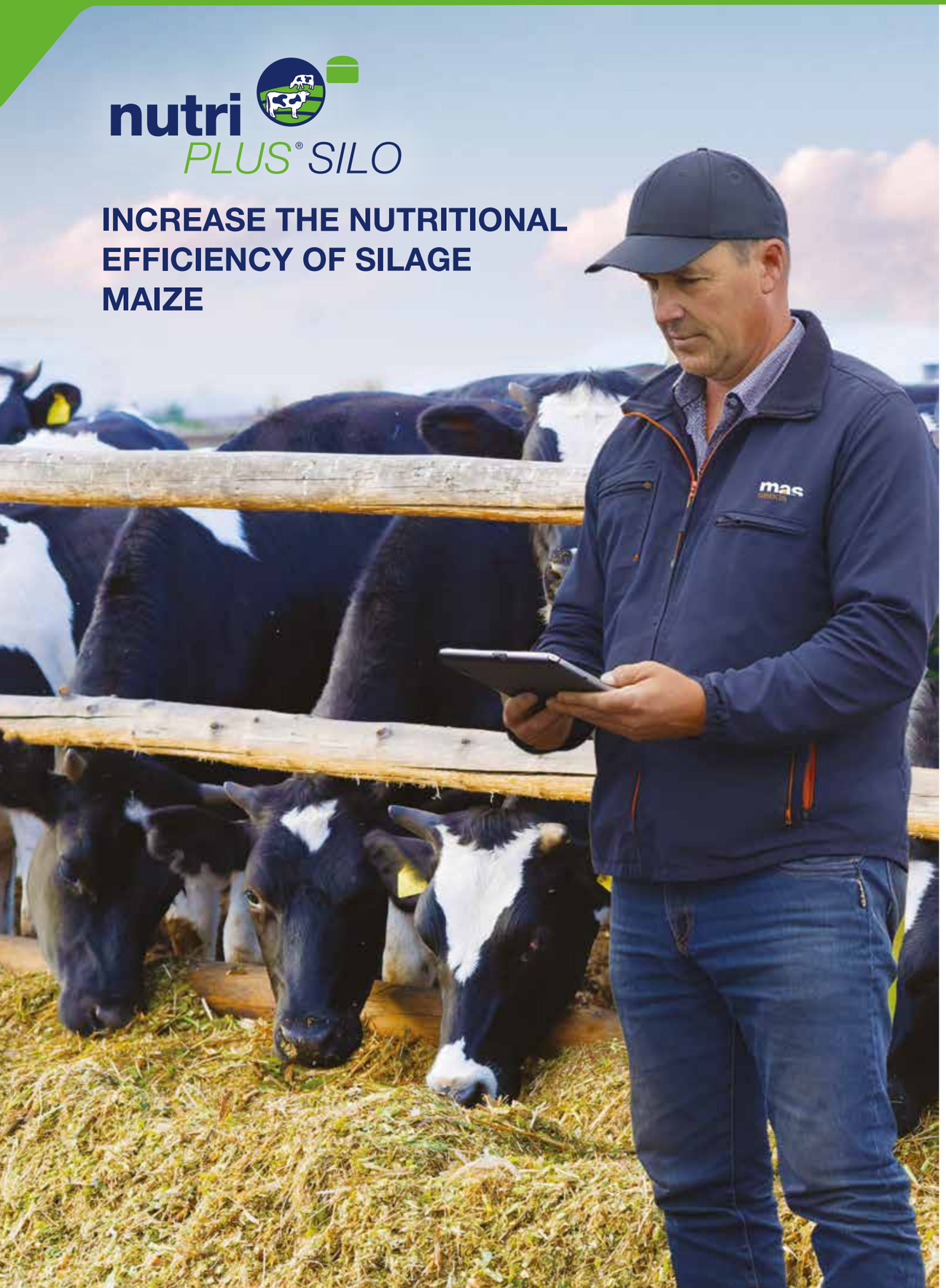
The regional report

The NUTRIPLUS® Observatory delivers a harvest window forecast per maturity group depending on selected sowing window in a region. The report combines following information representing a region on a table:

- Locations
- Varieties from different maturities
- Sowing periods

It is possible to identify all actual harvest maturity situation in a region at glance thanks to the summary of comparative data.

	MAS 10A Silage maturity at 35%DM		**MAS 26R** Silage maturity at 35% DM		**FREEMAN** Silage maturity at 35%DM	
Sowing period :	15 apr - 30 aug	30 apr - 15 may	15 apr - 30 apr	30 apr - 15 may	15 apr - 30 apr	30 apr - 15 may
Nantes (FR)	5 - 12 august	12 - 21 august	10 - 17 august	17 - 27 august	19 - 27 august	27 aug - 5 sept
Angers (FR)	6 - 12 august	12 - 22 august	11 - 18 august	18 - 27 august	20- 27 august	27 aug - 7 sept
Rennes (FR)	14 - 22 august	22 - 30 august	20 - 28 august	28 aug - 6 sept	30 aug - 7 sept	7 - 19 sept
Loudéac (FR)	20 - 28 august	28 aug - 6 sept	27 aug- 3 sept	3 - 14 sept	7 - 16 sept	16 - 29 sept



INCREASE THE NUTRITIONAL EFFICIENCY OF SILAGE MAIZE

NUTRIPLUS® Silo is a real decision making tool helping to improve silo management practices by analysing your silo, identifying losses and giving you recommendations about how to improve for the next silo.

User:	
Service:	
Crops:	

Optimise my silo quality

Harvest date in silage in one of the key parameter to get a qualitative and quantitative.

2 out of 3 farmers do not harvest at the right stage in silage and A bad silage quality management can lead to **50** to **250€/ha losses** or **4000/silo***.

*1 ton of dry matter costs about 100 € to produce (average in France)

Plant Quality + Harvest Quality + Fermentation Quality

Silage Quality

Benefit from on farm silo diagnostics

Our MAS Seeds® expert, after opening your silo, makes a **complete diagnostic of your silo** thanks to a **hight precision sensor** (XNIR) collecting data:

1. Silo quality **observation**
2. Temperature & compaction **sampling**
3. Feed value **analysis**
4. Calculation of **front attack advancement**

The **XNIR is a sensor to measure maize %DM** with the following characteristics :

- Precision with the infra-red technology
- MAS Seeds® expertise with a specific calibration on silo

Receive expert personalized report and advices about your silo

Our MAS Seeds® expert lets you after the diagnostic a complete report and personalised advices for a better silo management:

REPORT

- Conservation quality
- Feed value
- Silo losses

ADVICES FOR NEXT CAMPAIGN

- Variety advices
- Harvest
- Silo management

Advices given in the individualized report will contribute to improve the quality of your forage and adapting your diet.

Corporate Contacts

Marketing and Sustainable Agriculture Department

François Harambat
Head of Marketing
& Sustainable Agriculture
33800 Bordeaux, France
+ 33 (0)6 72 46 02 59
harambat@maisadour.com

TEMPERATE & TROPICAL MAIZE

Florence Delattre
Head of Maize Portfolio
40280 Haut Mauco, France
+ 33 (0)6 89 72 85 64
delattre@maisadour.com

François Boche
Silage Maize Portfolio
Manager
40280 Haut Mauco, France
+ 33 (0)6 71 92 29 15
boche@maisadour.com

Matthieu Chaix
Early Grain Maize
Portfolio Manager
61315 Poznan, Poland
+48 605 197 777
chaix@maisadour.com

Thierry Dupouy
Late Grain & Special
Maize Portfolio Manager
40280 Haut Mauco, France
+ 33 (0)6 88 38 02 80
t-dupouy@maisadour.com

Emeline Prugent Lere
Marketing & Development
New Markets / Tropical Maize
40280 Haut Mauco, France
+ 33 (0)7 50 67 93 08
e.prugent-lere@maisadour.com

SUNFLOWER, OILSEED RAPE, SOYBEAN, ALFALFA, SORGHUM AND MIXTURES

Gabriel Magaddino
Sunflower Portfolio
Manager
40280 Haut Mauco, France
+ 33 (0)6 07 98 99 25
magaddino@maisadour.com

Thibault Leclerc
Diversification & Agroecology
Portfolio Manager
40280 Haut Mauco, France
+ 33 (0)6 77 89 78 32
t.leclerc@maisadour.com

CUSTOMER EXPERIENCE & AGRO-DIGITAL

Julien Tribot
Head of Customer Experience
40280 Haut Mauco, France
+ 33 (0)6 75 90 94 29
tribot@maisadour.com

Laure Tassart
Agro Services Lead
33800 Bordeaux, France
+ 33 (0)6 32 31 29 52
l.tassart@maisadour.com

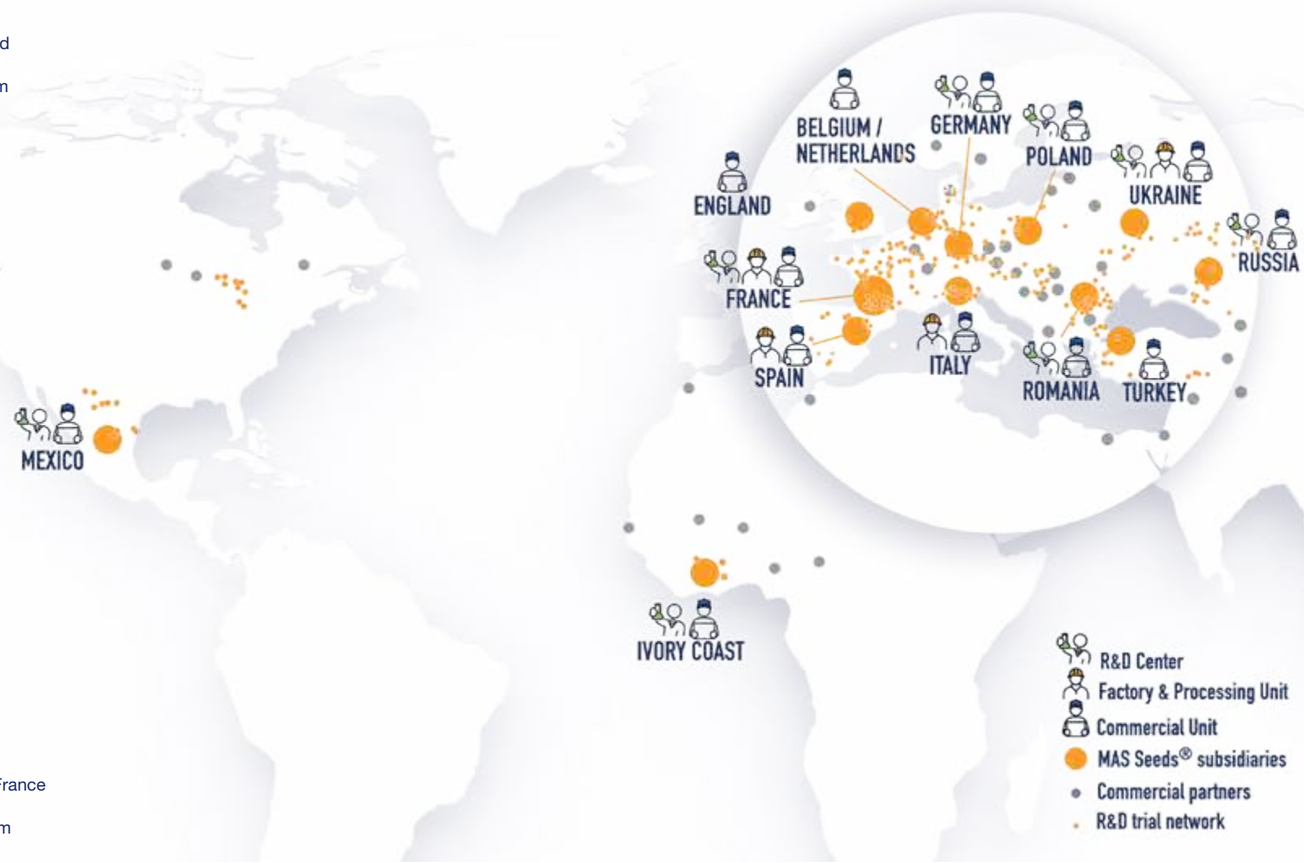
Alexandra Reix
CRM Officer
40280 Haut Mauco, France
+ 33 (0)6 88 65 91 43
a-reix@maisadour.com

COMMUNICATION

Lucie Bua
Corporate Communication
Lead
40280 Haut Mauco, France
+ 33 (0)6 81 25 68 43
bua@maisadour.com

Emma Berteloot
Product Communication
Lead
33800 Bordeaux, France
+ 33 (0)6 47 15 04 99
e.berteloot@maisadour.com

Sophie Cahisa
Marketing & Communication
Technician
40280 Haut Mauco, France
+ 33 (0)6 08 16 69 10
cahisa@maisadour.com



Contact
MAS Seeds® Headquarters
Route de Saint Sever
40280 Haut Mauco, FRANCE
E-Mail: masseeds@maisadour.com
www.masseeds.com

Notes

Notes

masseeds.com

Discover our
MAS4 MIXTURES
Ask for our new
Mixtures Guide 2024

MAS Seeds®

Route de Saint-Sever
40280 HAUT-MAUCO
FRANCE

A BRAND OF MAÏSADOUR

masseeds®
ACT TOGETHER FOR A CHANGING AGRICULTURE