



# Selecting and growing the correct maize variety 2024



## Why include maize in the diet?

Maize is an excellent source of starch for inclusion in the rations of ruminant livestock. By feeding a balanced amount of forage maize in the diet together with grass silage, feed intake and milk / meat production will increase.

For best returns growers should select maize varieties based on maximising both dry matter yields and the nutritional feeding qualities provided by the starch content and cell wall digestibility.

### Starch

The starch in maize provides rumen fermentable energy to 'fuel' the microbial population in the rumen. Maize starch has a slower rate of fermentation so reduces the risk of acidosis compared to other feed sources e.g. cereals.

### Cell Wall Digestibility

Increased cell wall digestibility will increase dry matter intake

## CHECK – Planning your maize starts with a soil analysis



To ensure your maize crop maximises its potential look beyond the basics with a ForFarmers Maize plus analysis to measure pH, P, K and Mg but also Boron and Zinc. Both micronutrients are essential for a healthy, high yielding maize crop. Zinc is required first for photosynthesis and the rapid growth of the developing maize plant followed by boron which has been proven during flowering and pollination for grain set. Potassium is a key nutrient to a maize crop as its helps to regulate water and move other essential nutrients around the plant.

## PREPARATION – Get the agronomy right for a successful maize crop.

### Subsoiling is essential

Maize is a deep rooting plant but poor at rooting. Any compaction will result in uneven and patchy germination and subsequent crop.

### Plough and cultivate

Leave a fine firm seedbed with a working tilth of 5cm.

### Generally sow from 20th of April onwards

This is a good target depending on soil temperature. The last week of April and first week of May are usually key drilling weeks.

### Soil temperature is key

Above 8°C for 3 - 4 consecutive days and preferably rising on light ground and 10°C on heavier soils.

### Drilling depth 3-5cm ensures moisture

Plant into moisture and consolidate to provide the optimum conditions for even germination.

### Row widths

Recommended row widths 75cm (30inches).

### Seed spacing

The optimum spacing for seeds is between 10 and 12 cm. (4 - 4.7 inches)

### Seed rates

104,000-111,000/ha (42,000-45,000/acre) for conventionally drilled maize. Lower seed rates may be recommended for some varieties and time of sowing.

### Lower seed rates

Advance maturity and can improve quality but will reduce DM yield.

### Higher seed rates

Increase DM yields but delay maturity and quality may suffer.

### Planting after grass?

Contact your forage technical specialist to discuss options.

## SOW – Seed selection

### ULTRA EARLY VARIETIES (FAO 150 -160)

#### The earliest maturing hybrids

- Least number of days to harvest - as little as 130 days
- Greater harvest security from early sowing period
- Increased options for subsequent autumn drilled crops
- Excellent option for sowing later on heavy soils
- Suitable for areas where conditions may restrict growth e.g altitude or more Northern areas.
- Rapid dry down
- Excellent energy density
- Maximises opportunity to boost ration density for milk or meat production
- Exceptional starch content for increased milk yield and protein
- Suitable for TMR rations where maize inclusion is 50% or lower

#### KWS CITO (FAO 150)

Suitable for early feedout or later sowing after spring forage crops. Maximum starch content is achievable in more challenging growing areas.

- Dry Matter Yield 93% - 16.7 t/ha DM
- Early Vigour 6.8 – Average - ideal for early or late drilling
- Starch Content 39.9% - Highest on list
- Exceptional ME Content 12.12 MJ/Kg DM – Highest on list to boost ration energy density and quality
- Cell Wall Digestibility – 60.0% - Highest on list
- Standing Power – 7.3 - Average
- Lodging 2.3 – Above average
- Eyespot 5.5

Data source: NIAB Forage Maize Descriptive List.  
First choice varieties for less favourable sites (2024)

NEW

#### KWS TEMPRANO (FAO 150)

Extreme earliness providing excellent dry matter and starch yields.

- Dry Matter Yield - 19.4t/ha DM
- Similar in earliness to KWS Cito
- Exceptional starch content 38.9%
- Highly suited to rations with 50% or lower maize inclusion
- Superb early vigour 7.4
- Suitable for early or late drilling
- Rapid dry down ensures early harvest
- Limited availability

Date source: NIAB NL2022

#### KWS AUGUSTUS (FAO 160)

Delivers high starch content silage where short season maturity is essential.

- 94% Dry matter yield - 16.8 t/ha DM
- Rapid early vigour - 6.9
- Excellent starch 38.0% - Above average
- ME Content 11.91 MJ/Kg DM - Above average
- Cell Wall Digestibility 59.2% - Above average
- Standing power 6.9 - Below average
- 3.1 Lodging - Above average
- Very high eyespot 6.7

Data source: NIAB Forage Maize Descriptive List.  
First choice varieties for less favourable sites (2024)



NEW

## P7381

- Dry Matter Content 39.8%
- Dry Matter Yield 15.78 t/ha DM
- Whole Plant Digestibility 77.85%
- ME Content 12.9 MJ/Kg
- Starch 40.75%
- Very good early vigour
- Lodging 7.9
- Eyespot 6.3

Data Source: Pioneer PACTS trials less favourable sites

## KWS PEREZ (FAO 160)

Early harvest and high yield.

- Dry Matter Yield 98% - 17.2 t DM / Ha
- Early Vigour 7.2
- Starch Content 35.5%
- ME Content 11.58 MJ / Kg DM
- Cell Wall Digestibility – 57.2%
- Standing Power – 5.8
- Lodging 5.4
- Eyespot 5.0

Data source: NIAB Forage Maize Descriptive List.  
Second choice varieties for less favourable sites (2022)

## P7326

Reaches 30% dry matter quickly and produces good yields of high starch content silage.

- Dry Matter Content 38.4%
- Dry Matter Yield 15.11 t/ha DM
- Whole Plant Digestibility 73.77%
- ME Content 12.82 MJ/Kg
- Starch 37.6%
- Very good early vigour
- Lodging 8.0
- Eyespot 6.2

Data Source: Pioneer PACTS trials for less favourable sites

## P7179

Delivers a very high starch content with a high dry matter yield.

- Dry Matter Content 42.51%
- Dry Matter Yield 15.07 t/ha DM
- Whole Plant Digestibility 77.28%
- ME Content 13.01 MJ/Kg
- Starch Content 42.42%
- Eyespot 8
- Good early vigour
- Lodging 7.4

Data Source: Pioneer PACTS trials for less favourable sites



## EARLY / MAINCROP VARIETIES (FAO 170 - 180)

### High yielding for mainstream areas

- 140 - 150 days typically to harvest
- Suitable for mainstream sites and higher heat unit areas.
- High yields reducing cost per tonne of dry matter
- Good options for crimped maize
- Suitable for large area growers and biogas to stagger harvest date
- Wide harvest window due to slow dry down
- 18t / ha DM can be exceeded
- Excellent for TMR diets up to 70% maize inclusion
- Energy dense silage with balanced starch for higher inclusion rates

### **PINNACLE** (FAO 180)

Maximising energy yield and feeding performance from an early harvest.

- Dry Matter Yield 100% - 17.8 t/ha DM
- Early Vigour 6.8 - Average
- Starch Content 35.8% - Above average
- ME Content 11.80 MJ Kg DM
- Cell Wall Digestibility 59.0%
- Standing Power 6.4
- Lodging 4.1
- Eyespot 6.6 - Above average

Data Source: NIAB Forage Maize Descriptive List  
First Choice variety for less favourable sites (2024)

### **DEBALTO** (FAO 170)

Leading starch yields and high grain density.

- Dry Matter Yield 99% - 17.8 t/ha DM
- Excellent vigour 6.9
- Starch Content 34.5%
- ME Content 11.64 MJ/Kg
- High grain : Stover ratio for energy dense silage
- Ideally suited for moderate to high (50-70%) TMR dairy or beef finishing rations
- Cell wall digestibility 57.9%
- Standing power 2.7
- Eyespot 6.6

Data source: NIAB Forage Maize Descriptive List  
Second choice varieties for favourable sites 2024

NEW

### **SKIPPER** (FAO 170)

High yields from an early harvest with high starch content.

- Dry Matter Yield 103% - 18.3 t/ha DM
- Early Vigour 6.9 - Average
- Starch Content 36.1% - Above average
- ME Content 11.83 - Above average
- Cell Wall Digestibility 59.2%
- Standing Power 7.6
- Lodging - 1.6

Data Source: Estimated position on NIAB Descriptive List 2024



## **KWS AUTENS** (FAO 170)

Stable yield performance and high kernel content. Proven starch yield in favourable areas.

- Very high Dry Matter Yields - 100% - 17.7 t/ha DM
- Standing Power 4.7
- Average Vigour - 7.1
- Starch content 34.3%
- ME Content 11.65 MJ/kg
- Cell Wall Digestibility - 58.2%
- Lodging - 7.6
- Eyespot - 5.3

Data Source: NIAB Forage Descriptive List. Second choice varieties for less favourable sites (2022)

## **P7034**

Very early maturity with a dent grain texture. High starch content and yield stability. Fast ruminal starch degradability.

- Dry Matter Content 38.81%
- Dry Matter Yield 15.21 t/ha DM
- Whole Plant Digestibility 73.85%
- ME Content 12.23 MJ/Kg
- Starch 37.51%
- Good early vigour
- Lodging 8.0
- Eyespot 5.4

Data Source: Pioneer PACTS trials for less favourable sites

## **AMBITION** (FAO 180)

Maximises energy yield, produces reliable, high quality silage.

- Dry Matter Yield 100% - 18.3 t/ha DM
- Early Vigour 7.2
- Starch Content 34.5%
- ME Content 11.67 MJ Kg DM
- Cell Wall Digestibility 58.3%
- Standing Power 8.0 - Above average
- Lodging 0.7
- Eyespot 6.4

Data Source: NIAB Forage Maize Descriptive List  
Second Choice variety for favourable sites (2024)

## **P7892**

Early maturity with consistent results in many different locations

- Dry Matter Content 38.26%
- Dry Matter Yield 17.43 t/ha DM
- Whole Plant Digestibility 70.12%
- ME Content 11.6 MJ/Kg
- Starch 44.0%
- Very good early vigour
- Lodging 7.9
- Eyespot 6.3

Data Source: Pioneer PACTS trials for favourable sites



## P7948

High yields of high quality silage along with high yields of grain when combined.

- Dry Matter Content 36.96%
- Dry Matter Yield 19.01 t/ha DM
- Whole Plant Digestibility 71.27%
- ME Content 11.81 MJ/Kg
- Starch 35.38%
- Good early vigour
- Lodging 8.0
- Eyespot 7.8

Data Source: Pioneer PACTS trials for favourable sites

NEW

## P7647

Delivers higher dry matter and grain yields on both favourable and less favourable sites.

- Dry Matter Content 37.66%
- Dry Matter Yield 16.89 t/ha DM
- Whole Plant Digestibility 78.44%
- ME Content 13.0 MJ/Kg
- Starch 41.28%
- Very good early vigour
- Lodging 7.6
- Eyespot 4.8

Data Source: Pioneer PACTS trials less favourable sites

NEW

## P7364

Tall, very early maturity with good early vigour and very good standing ability. High dry matter with good starch content.

- Dry Matter Content 36.37%
- Dry Matter Yield 15.86 t/ha DM
- Whole Plant Digestibility 75.97%
- ME Content 12.6 MJ/Kg
- Starch 37.67%
- Very good early vigour
- Lodging 8.0
- Eyespot 7.0

Data Source: Pioneer PACTS trials less favourable sites



## LATE VARIETIES (FAO 200 - 220)

### Maximum energy yield

- Usually 150+ days to harvest
- Maximise total yield and energy yield
- Suitable for mainstream, highly favourable sites, high heat unit areas and sandy soils
- Allows for wider drilling and harvesting window
- Yields can exceed 4t DM/ha under the right conditions
- Stay green characteristics provide a wide harvest window
- Prolonged biogas plant retention times to maximise gas yields

## KWS KEOPS (FAO 210/220)

Combines high yields and agronomic stability on favourable sites.

- Significant yield potential on favourable sites - 23.3 t/ha DM
- Suitable for spreading drilling window
- Wide harvest window due to stay green nature
- Strong early vigour

Data Source: KWS LP251 2019 - Average all sites



## CRIMPED OR GRAIN MAIZE

Grain maize as well as producing a cash crop also has the advantages of providing a break in cereal rotations which provides an opportunity to reduce blackgrass populations.

- The mature maize crops can be combined for their grain where crimped maize or dried grain can be produced
- Harvesting needs to be later for riper grain usually 3-4 weeks later than for silage
- A combine with a maize picker header required for harvest
- Required kernals of dried grain need to be of high quality and an attractive yellow colour for the end market
- When crimping maize a preservative is required to create a moist, high energy and digestible feedstuff
- Variety selection needs to consider disease resistance, grain dry down, standing power, high grain yield with good cob cover
- Recommended varieties Pinnacle, Cito, Debalto, P7179, P7326, P7034, P7948



## FEED – Nutrition for the crop

### Starter fertiliser

By completing a Maize Plus soil analysis allows for nutrient applications to be based on actual soil results with attention focused on environmental legislation.

It is recommended that a starter fertiliser is used at drilling. An application of a minimum of 65 kg/ha of DAP will provide extra support to the early growth of the crop, improving dry matter yields and can also bring crop maturity forward.

### Foliar feed

Maize is a hungry crop but applying a fast acting foliar feed can increase growth and development of the crop through the vulnerable early growth stage.

Using a foliar feed on the leaves is more effective than applying through the soil. Plant tissue samples can be taken to ascertain which nutrients are lacking and how best to target the deficiency.

### MANAGE – Control the weeds

Maize is a very poor competitor and can soon become swamped with weeds. Yields can quickly slump in a dirty crop. Poor weed control is often the biggest single factor contributing to disappointing results with maize so it is important to get it right. If you 'start clean and stay clean' which incorporates pre emergence weed control, it creates a bespoke weed programme. Contact your forage specialist for further advice.

### When is maize ready to harvest?

Forecasting the expected date of maize harvest is extremely important to maximise crop value as well as planning rotations. Harvest date is mainly determined by the variety sown and the season.

Maize harvest is also dependent on the geographical area, site, season as well as the variety maturity. When assessing a crop it needs to be checked in several locations and not just the perimeter.

The ideal harvest time is when cobs have reached maximum starch yield, have sufficient moisture to compact easily in the clamp and an ideal dry matter (DM) between 32-35%.

### Harvest maturity indicator

Grain description	Milky	Milky doughy	Doughy milky	Doughy	Hard dough, top is hard and glassy	Hard and glassy
						
Milk line	None	Beginning to show from top	1/4 way down grain	1/3 way down grain	1/2 way down grain	At bottom
Husk	Green	Green	Green	Yellowing	Yellowing	Desiccated
Whole plant DM (%)	Less than 25	25-28	28-30	30-32	32-35	Over 35
Status	Not ready	Not ready	Not ready	Ready	Ready	Too late

### Effects of harvesting too early

- High fresh weight yield, but not maximum DM yield. Water will be stored in the clamp.
- Harvesting before optimum grain fill compromises starch content and yield.
- High fibre rich crop.
- Compaction easy and ensiles well.
- Potential loss of nutrients through effluent production.

### Effects of harvesting too late

- Increased harvesting costs and increased field losses.
- Low digestibility and palatability.
- Poor clamp stability.
- Difficult clamp consolidation which will require a shorter chop length.
- Soil damage / compaction.

### Check chop length and cutting height

Managing chop length and quality will help promote consistent feedout and high voluntary intakes. Optimum cutting height is 20cm above the ground level. The lower part of stalk has little feed value and high water content. Cutting at this height will avoid soil contamination and the stem below this height is also likely to contain high levels of Fusarium carrying the risk of mycotoxins. Chop length has a major impact on the level of effective fibre ultimately provided in the silage. Typical chop length is 20-25mm.

Short material will have insufficient effective structural fibre to maintain rumen health. Longer chop length will increase rumination time and rumen function. The kernels are the most nutritious part of maize and holds the starch. The kernels must be damaged or cracked so that they can be digested.

### Successful ensiling and clamp management

Ensiling and clamp management is key to preserving the full value of silage but also an area where the biggest losses and waste can occur. Pre-harvest clean clamp of any old silage which cannot be used. A narrow clamp design to limit surface area exposed to air is the most ideal. Fill the clamp quickly but carefully in thin layers, consolidate well but rolling continuously and seal completely for rapid, anaerobic fermentation.

During feedout a tight cut will prevent moulding of the clamp face. Moving quickly across the face will prevent spoilage.

### Use an inoculant to maximise quality

Inoculant application is essential on a maize crop as we should focus on converting all potential energy from the crop in terms of energy into meat or milk. Using an inoculant can reduce aerobic spoilage and dry matter losses. Heating and waste after opening are also reduced.

Type	Requirement	Products		
INOCULANT	FERMENTATION + PERFORMANCE	<b>PIONEER 11A44</b> L.Buchneri Pack = 50/250tt Apply 10mls to 2L/t		
	FERMENTATION + PERFORMANCE + AEROBIC STABILITY	<b>ECO COOL</b> Ecosyl+L.Buchneri Pack = 100tt Apply 20mls to 2L/t	<b>PIONEER 11C33 RAPID REACT</b> Multistrain + L.Buchneri Pack = 50/250tt Apply 10mls to 2L/t	
INOCULANT + ENZYME	FERMENTATION + PERFORMANCE + AEROBIC STABILITY	<b>SIL-ALL MAIZE PLUS</b> Multistrain+Enzymes Pack = 100tt Apply 50mls to 2L/t	<b>PIONEER 11CFT</b> Multistrain + L.Buchneri +Enzyme Pack = 50/250tt Apply 10mls to 2L/t	<b>ADVANCE Maize</b> Multistrain+Enzyme Pack = 50tt Apply 20mls to 2L/t
INOCULANT + CHEMICAL PRESERVATIVE	FERMENTATION + PERFORMANCE + AEROBIC STABILITY	<b>DA ECOCORN</b> Ecosyl+Potassium Sorbate Pack = 50tt Apply 2L/t		

## ENVIRONMENTAL

### Undersowing Maize

By sowing grass under a maize crop reduces nitrogen loss and provides a level of erosion control after maize harvest. Undersown maize crops have less over winter soil and nutrient leaching losses and will improve the future output of the ground. Undersowing a maize crop should be considered where there are no plans for a post harvest cover crop establishment or cultivations during the winter months.

Companion crops can be sown at establishment or at the 4-6 leaf stage. As well as supporting soil stability and nutrient retention it will produce good quality forage either for grazing or ensiling, giving continuous production.



## TOPGRASS Undersown Maize Mix

### At Sowing

- 60% Tall Fescue PLUS
- 40% Cocksfoot
- Rec.sowing rate 4-6kg/ acre (10-14kg/ha)

### At 4-6 Leaf Stage

- 30% Hybrid Ryegrass PLUS
- 35% Tet Hybrid Ryegrass
- 35% Tet Int Perennial Ryegrass
- Rec. sowing rate 4-6kg/acre (10-14Kg/ha)

### After Maize Sowing

As bare soil is vulnerable to soil erosion and nutrient leaching sowing a crop will help reduce losses. Sowing a follow on crop straight after harvest is crucial for maximum results.

An after maize crop utilises residual soil heat and nutrients allowing them to germinate quickly and establish a root system before winter, to reduce soil erosion. Utilising sowing after maize also can help fill any gaps in forage stocks by utilising land more effectively.

**Grass** – Aggressive, fast establishing grasses are best as they will get away well before winter sets in.

Sowing rates can vary from 10 – 16kg/acre

- Westerwolds – can provide a useful early bite in March or a first cut in mid April.
- Italian – gives similar yields to westerwolds but also offers the benefit of lasting for two years.

**Forage Rye** – Very hardy and can withstand severe frosts. Suitable for early turnout and can be cut or grazed. Sowing rate 65 – 75kg / acre

**Green Manuring** – Improve soil fertility and health. Species include fodder or oil radish, phacelia or vetch.



## What our customers say:

### AN. Evans - Pembrokeshire.

These high starch early varieties are fantastic – milk gone up 3lts since we started feeding. **KWS Cito**

### J.Ford - East Sussex.

Despite a difficult start with the weather earlier in the year I have now harvested a bumper crop of **Pioneer P7034**, which has also performed very well over the past four years.

### P. Thomas - Berkshire.

Our contractor said it was the best, most even crop he has harvested in 3 years. **Pioneer P7179**

### M.Frampton - Dorchester.

One of the best crops I have cut. 22t / acre of **Pioneer P7948**.

### A.Sills - Derbyshire.

I've grown **KWS Cito** for the last 4 years and it has always yielded very well with an early harvest.



For information on selecting and growing maize, please contact your local account manager or our forage technical specialists on:

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Autumn 2023

**for**  
**farmers**  
the total feed business