

Forage Maize Varieties



Irish Recommended List 2019

CROPS EVALUATION AND CERTIFICATION DIVISION



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

www.agriculture.gov.ie

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IMPORTANT NOTICE

The Department of Agriculture, Food and the Marine (DAFM) has taken all due care in evaluating the performance of the listed varieties for yield, quality, disease resistance and the important agronomic characters over a wide range of soils and environmental conditions, for a minimum period of 3 years. The Department cannot, however, accept responsibility for any loss or inconvenience arising from any future variation in absolute or relative varietal performance. The Department of Agriculture, Food and the Marine

ACKNOWLEDGEMENTS

The Department of Agriculture, Food and the Marine wishes to acknowledge the co-operation received from Maize breeders, Seed Agents and the growers on whose land the trials were conducted

Maize Growing in Ireland

Forage maize grows best in areas of Ireland with a long growing season, freedom from late spring frosts and early winter frosts, high overall temperatures and maximum sunlight. Fields chosen for maize production should be south facing where possible in order to maximise sunlight and temperatures over the growing season. Elevated and exposed sites are generally unsuitable. Maize needs good soil and is not tolerant of soil compaction. Very light sandy soils will give reduced yields. Growing on very heavy clay soils, particularly if they have underlying poor drainage, may delay sowing date and make harvesting difficult as well as causing damage to the soil structure. In Ireland, maize is sown in spring and is grown under two production systems; 1. 'Uncovered', and 2. 'Covered'. The difference between both systems is that covered crops are sown under a thin plastic film spread over two crop rows that is applied to the soil surface at the time of sowing. This creates a mini greenhouse effect which quickly brings about a significant increase in the temperature of the air and soil underneath the cover and allows sowing to be carried out earlier than for uncovered crops. Sowing dates should also be determined on the basis of the usual climate and the experience gained in the area over the years.

In recent years there has been a large swing to growing covered Maize with an estimated 90% of the crop now grown in this system. Larger annual variability in yields and quality of uncovered crops compared to relatively consistent yields and quality in covered crops has largely contributed to the move towards covered crops.

The 2019 Maize Recommended List is based on data from DAFM trials in the period 2016 to 2018. The average sowing and harvesting dates for these trials was 25th April and 08th October respectively.

Introduction

This booklet lists the forage maize varieties that are considered most suitable for growing under Irish conditions. Reflecting the move towards growing covered maize, DAFM discontinued National/Recommended List trialling of uncovered Maize in 2015 and for that reason this publication does not include an updated uncovered Recommended List. The last uncovered Maize RL from 2015 is included in an appendix to this booklet.

The varieties included on the Recommended List have completed a minimum of three years in the Department of Agriculture, Food and the Marine trials on farms situated in various geographic locations considered suitable for maize production. The trials are grown within commercial maize crops and in accordance with good farming practice.

The trials were located in Cork, Kildare, Louth, Meath and South Kilkenny during the period 2016 to 2018. The yearly trial results over these three years are combined in a single evaluation. All varieties trialled in 2018 are listed in an appendix to this booklet.

Variety Testing Procedure

New varieties are submitted annually to the Department from Irish Agents acting on behalf of International plant breeders or directly from these breeders. These varieties enter combined National List/ Recommended List trials. Trials comprise up to 20 varieties each year and are grown at up to five locations. The varieties are assessed for their suitability under Irish conditions for dry matter yield, dry matter content, starch content and other traits.

After completing 3 years in official trials, new varieties showing superior performance are given positive Value for Cultivation and Use (V.C.U.) status. Those varieties can be National Listed by the breeder provided they have been awarded a DUS certificate. At this stage varieties can also be considered for Provisional Recommendation on the Recommended List. If a Provisionally Recommended variety continues to perform well, it may be upgraded to Full Recommendation status after 1, 2 or occasionally 3 years of further trialling. Provisional recommendation is possible for a maximum of three years.

Growers should only select the varieties listed because these varieties have been independently and robustly tested by DAFM over a minimum of 3 years under Irish conditions and have been proven to perform in these conditions.

Throughout the trial programme, efforts are being made to select better and earlier maturing varieties that will improve the yield and quality of the crop, as well as allowing it to be successfully grown in areas that were previously considered climatically marginal for forage maize production.

Types of Recommendation

Varieties appearing on the list for the first time are **Provisionally Recommended (PR)**, and have completed three years in combined National list/ Recommended list (NL/RL) trials. The eventual status of these varieties is determined by their subsequent level of performance in ongoing NL/RL trials; fully **Recommended (R)** classification may be deemed to be merited after a further one, two or exceptionally three years, or alternatively they may be removed from the list at any stage.

Laboratory Analysis

The Department of Agriculture, Food and the Marine take whole-crop samples from each trial plot at harvesting and dry them to determine the dry matter content. These dried samples are analysed by FBA Laboratories Ltd., Cappoquin, Co. Waterford and SAC Laboratories in Scotland.

Explanation of Results

Yield of Dry Matter/ha: Dry matter yield per hectare is calculated by measuring the fresh yield of the crop, eliminating the moisture content and expressing on a per hectare basis. Table 1 shows the average dry matter yield of the control varieties in the 2019 DAFM Recommended List trials was 18.9t/ha. In the attached table relative yields are used to show differences between varieties with the average of the control varieties set at 100. Varieties with a value in excess of 100 achieved higher yields than the controls and varieties with a value less than 100 achieved lower yields than the controls.

Yield of dry matter for forage maize is the only true assessment of yield in maize crops because the nutritional value of the crop is contained within the dry matter fraction. For this reason yields of dry matter should always be used instead of fresh weights in assessing forage maize yields. Differences in the dry matter/ moisture of the crop often result in fresh yields that are not correlated in any way with dry matter yield.

Starch Content: In the lead up to maturity, sugars in the plant move to the cob where they are converted to starch. Starch is an important indicator of the feeding value of the crop and is the main source of energy content in a well matured crop at harvest. Starch content is expressed as a percentage of the dry matter and is determined by wet chemistry. Table 1 shows the average starch content of the control varieties in the 2019 DAFM Recommend List trials was 25.2%. Relative yields are used to show differences between varieties with the average of the control varieties set at 100. Varieties with a value in excess of 100 had higher starch content than the controls and varieties with a value less than 100 had lower starch content than the controls.

ME (MJ/kg): The ME system is used for differentiating maize varieties instead of the net energy system now commonly in use because the net energy system does not currently allow us to compare different maize varieties on their nutritional value. The ME value is an estimate of the energy available to an animal as a result of digestion of the feed material and is expressed in Megajoules per Kilogram.

Year first Recommended: The first year the variety was placed on the Recommended List.

Earliness of Maturity/Dry Matter Content: Dry matter is a good indicator of how much the crop has matured prior to harvest. The figures presented in Table 1 are on a relative basis, with the average of the control varieties set at 100, values in excess of 100 have higher dry matter content and values less than 100 have lower dry matter content.

The relative dry matter has an associated text, called a maturity descriptor, which indicates the maturity of the variety. The range in relative maturities for each maturity descriptor is shown in the table below:

Relative Dry Matter	Maturity Descriptor
≥ 108	Early
103-107	Early-Medium
98-102	Medium
93-97	Medium-Late
≤ 92	Late

The maturity descriptor can be used by maize growers as an aid in the selection of maize varieties suitable for their circumstances. There are large differences in the favourability of maize growing sites in Ireland, therefore selection of varieties suited to specific sites is an important decision when aiming to grow a good crop successfully.

A maize grower in a less favourable site would generally be recommended to select an early maturing variety particularly if sowing late in the season. A maize grower in a favourable site would generally be recommended to select a late maturing variety particularly if sowing early in the season. Late maturing varieties are generally higher yielding than early maturing varieties. However, starch content is an important consideration which must also be taken into account and late maturing varieties should not be sown in less favourable sites as this would result in crops not maturing and having a low starch content, particularly in poor maize growing years.

The following text is derived from “The Maize Guide” which was published in 2017 and is a collaborative industry led publication which further demonstrates the importance of appropriate variety selection for a given site.

The key factors when considering what variety to sow are:

1. Site Location
2. Maturity Rating

Table 3. Site Location

Pick Your Site	Type of Site	Attributes of Site
	Excellent	- 0-50m above sea level
		- Free draining
		- South facing
		- Sheltered
	Good	- 50-75m above sea level
		- Good soil condition
		- Southerly aspect
		- Reasonable shelter
	Marginal	- 75-100m above sea level
- Heavy ground		
- Late sowing/early harvest		
- Exposed site		

Note: Your site should achieve 3 to 4 of the attributes for a site type

Figure 1: Selection of varieties appropriate to a site type based on variety maturity

		Maturity Descriptor of Variety				
		Late	Medium-Late	Medium	Early -Medium	Early
Site Suitability	Excellent					
	Good					
	Marginal	X	X			



= Very suitable



= Suitable



= Risk involved



= Do not sow

Summary facts:

- Look for a very suitable variety for your site
- Late maturing varieties shouldn't be sown late
- Late maturing varieties tend to produce higher yields
- Early maturing varieties tend to have lower yield but higher starch

**Table 1: Recommended List (2019)
of Covered Forage Maize Varieties**

Actual yield data is shown for the mean of the control varieties, and the relative yield data (as % of controls) is shown for all varieties. The data is based on results of trials carried out in the period 2016 to 2018.

	Yield of Dry Matter (t/ha)	Starch content (%)	ME (MJ/kg)	Year first Recommended	Dry Matter Content (%) / Earliness of Maturity	
Controls*	18.9	25.2	—	—	39.7	
Ambition (R)	90	113	11.7	2016	117	Early
Award (R)	99	102	11.5	2011	105	Early-Medium
Grosso (R)	102	99	11.8	2015	97	Medium-Late
Konfluens (PR-1)	106	94	11.5	2019	97	Medium-Late
LG30211 (R)	98	99	11.7	2016	98	Medium
LG31.235 (PR-1)	108	102	11.8	2019	96	Medium-Late
P7905 (R)	103	100	11.7	2015	96	Medium-Late
P8200 (R)	109	91	11.4	2017	98	Medium
P8201 (R)	113	102	11.5	2018	98	Medium
Spyci CS (R)	97	105	11.8	2018	103	Medium
SY Feeditop (R)	97	103	11.8	2017	105	Early-Medium

* The Control varieties were Award, Justina and LG30211 in 2016 & Award, LG30211 and P7905 in both 2017 & 2018.

(R): Recommended for general use. (PR): Provisionally Recommended (The number after the PR indicates the number of years provisionally recommended).

Characteristics of the varieties in Table 1

- Ambition (R):** This is the lowest yielding variety on the list. It has the highest starch content on the list. It has extremely high dry matter content and is an extremely early maturing variety. It is suitable for late sowing and/or early harvest particularly on less favourable sites. Bred by Limagrain Verneuil Holding, France. Irl Agent: Goldcrop Ltd.
- Award (R):** This is a good yielding variety with good starch content. Dry matter content is high and it is an early-medium maturing variety. Bred by Limagrain Advanta Nederland BV, The Netherlands. Irl Agent: Goldcrop Ltd.
- Grosso (R):** This is a good yielding variety with good starch content. It has moderate dry matter content and is a medium-late maturing variety. More suited for early sowing in favourable sites than in unfavourable sites. Bred by KWS Saat, Germany. Irl Agent: DLF Seeds.
- Konfluens (PR-1):** This variety first entered onto the Recommended List with a Provisional Recommendation in 2019. This is a high yielding variety with moderate starch content. Dry matter content is moderate and it is a medium-late maturing variety. More suited to early sowing in favourable sites than in unfavourable sites. Bred by KWS Saat, Germany. Irl Agent: DLF Seeds.
- LG30211 (R):** A good yielding variety with good starch content. Dry matter content is good and is a medium maturing variety. Bred by Limagrain Verneuil Holding, France. Irl Agent: DLF Seeds.
- LG31.235 (PR-1):** This variety first entered onto the Recommended List with a Provisional Recommendation in 2019. It is a very high yielding variety with good starch content. Dry matter content is moderate and it is a medium-late maturing variety. More suited to early sowing in favourable sites than in unfavourable sites. Bred by Limagrain Verneuil Holding, France. Irl Agent: Goldcrop Ltd..
- P7905 (R):** A high yielding variety with good starch content. It has moderate dry matter content and is a medium-late maturing variety. More suited to early sowing in favourable sites than in unfavourable sites. Bred by DuPont Pioneer.
- P8200 (R):** It is a very high yielding variety. It has the lowest starch content on the List. It has good dry matter content and is a medium maturing variety. Bred by DuPont Pioneer.

- P8201 (R):** This is the highest yielding variety on the Recommended List. It has good starch content. Dry matter content is good and it is a medium maturing variety. Bred by DuPont Pioneer.
- Spyci CS (R):** This is a moderate yielding variety with high starch content. Dry matter content is high and it is an early-medium maturing variety. Bred by Caussade Semences. Irl Agent: Goldcrop Ltd.
- SY Feeditop (R):** This is a moderate yielding variety and has high starch content. It has high dry matter content and is an early-medium maturing variety. Bred by Syngenta. Irl Agent: Goldcrop Ltd.

Appendix 1: Varieties evaluated in the Covered Maize National List / Recommended List Trial 2018

	Variety Name/ Breeder's Reference	Trial Year '18	Agent	Breeder & Country	Breeder's Reference
1	Amaizi CS	1	GC	Caussade (F)	CSM 16001
2	Ambition	6	GC	Lim. Vern (F)	LZM159/87
3	Autens KWS	1	DLF	KWS Saat (DE)	KXB 4001
4	Award	11	GC	Lim. Vern. (F)	ADV 4635
5	ES Legolas	1	DLF	Euralis (F)	ESZ6106
6	Grosso	6	DLF	KWS Saat (DE)	KXA 8151
7	Konfluens	3	DLF	KWS Saat (DE)	KXB 3326
8	KWS Iconico	1	DLF	KWS Saat (DE)	KXB 6315
9	LG30211	7	DLF	Lim. Vern (F)	LZM158/72
10	LG31.235	3	GC	Lim. Vern (F)	LZM263/77
11	Mantilla	1	DLF	Lim. Vern (F)	LZM165/51
12	P7905	7	DP	DuPont Pioneer	X8V245
13	P7932	2	DP	DuPont Pioneer	X80F261
14	P8171	1	DP	DuPont Pioneer	X80K287
15	P8200	5	DP	DuPont Pioneer	X75B142
16	P8201	4	DP	DuPont Pioneer	X80D062
17	Petroschka	1	GC	DSV (DE)	SA 1433
18	Spyci CS	4	GC	Caussade (F)	CSM 2152
19	SY Feeditop	5	GC	Syngenta (F)	SB 0850
20	SY Rotango	1	GC	Syngenta (F)	SA 1062

Trial Year '18 indicates number of years the variety has been in trial

Agent: GC = Goldcrop, DLF = DLF Seeds, DP = DuPont Pioneer

Breeder: 'Lim. Vern.' indicates 'Limagrain Verneuil Holding', 'Caussade' indicates 'Caussade Semences', 'KWS Saat' indicates 'KWS Saat AG', 'Mais. Seme' indicates 'Maisadour Semences' and 'Satb Linz' indicates 'Saatbau Linz GmbH'.

Appendix 2

Recommended List (2015) of Forage Maize varieties suitable for growing without plastic cover (Uncovered)

Actual yield data is shown for the mean of the control varieties, and the relative yield data (as % of controls) is shown for all varieties. The data is based on results of trials carried out over three years in the period 2012 to 2014.

	Yield of Dry Matter (t/ha)	Dry Matter content (%)	Starch content (%)	ME (MJ/kg)	Plant Height (metres)	Year first Recommended
Controls*	15.5t/ha	35.4	23.3	—	—	—
Activate (PR-1)	96	120	117	11.31	1.96	2015
Ambition (R)	105	106	113	11.33	2.15	2014
Atrium (R)	101	90	105	11.12	2.01	2013
Beacon (R)	99	99	108	11.08	2.13	2012
Beethoven (R)	104	94	88	10.96	2.15	2010
Kroft (R)	92	113	121	11.08	1.97	2014
Severus (PR-1)	102	104	114	10.90	2.06	2015

* The Control varieties were Beethoven, Beacon and Destiny in 2013 trials and Beethoven and Beacon in 2014 trials.

* Due to insufficient lodging occurring during the trial period 2012 to 2014, it was not possible to provide varietal lodging data.

(R): Recommended for general use. (PR): Provisionally Recommended (The number after the PR, indicates the number of years provisionally recommended).

Yield and quality data shown for Uncovered trials and Plastic covered trials are not directly comparable, because the trials were grown in different locations and under different conditions.

Yield and quality data shown for Uncovered trials and Plastic covered trials are not directly comparable, because the trials were grown in different locations and under different conditions.

Characteristics of the varieties in Appendix 2 when grown without plastic cover

- Ambition (R):** **Uncovered:** Fully Recommended variety in 2015. High relative yield and Dry Matter with very high starch content. An early maturing variety. Bred by Limagrain Verneuil Holding, France. Irl Agent: Goldcrop Ltd.
- Atrium (R):** **Uncovered:** Good yielding variety. It has the lowest dry matter content on the list. High starch content. Late maturing variety. Bred by Limagrain Advanta Nederland BV, The Netherlands. Irl Agent: Seed Technology Ltd.
- Beacon (R):** **Uncovered:** Good yielding variety with good dry matter content. Very high starch content. Medium-early maturing variety. Bred by Limagrain Verneuil Holding, France, Irl Agent: Goldcrop Ltd.
- Beethoven (R):** **Uncovered:** High yielding variety. Moderate dry matter content. Low starch content. Medium-late maturing variety. Bred by Limagrain Verneuil Holding, France. Irl Agent: Seed Technology Ltd.
- Kroft (R):** **Uncovered:** Below average yielding variety. Very high Dry Matter and exceptional starch content, the highest on the Recommended List. A very early maturing variety and suitable for less favourable sites. Bred by KWS, Germany. Irl Agent: Seed Technology Ltd.
- Severus (PR-1):** **Uncovered:** First entered the list in 2015 with a provisional recommendation. Yield and dry matter are good and starch content is very high. An early maturing variety. Bred by KWS, Germany. Irl Agent: Seed Technology Ltd.

RECOMMENDED LISTS

- Cereal Varieties
- Herbages Varieties: (Grasses and Clover)
- Spring Bean Varieties
- Winter Oilseed Rape Varieties

CROPS SCHEMES AND SERVICES

- Seed Certification
- Seed Testing

The use of certified seed ensures a high level of varietal purity and germination.

Requests for this booklet should be sent to:

Crop Policy, Production & Safety Division,
Department of Agriculture, Food and the Marine,
Administrative Building, Backweston Campus,
Stacumny Lane, Celbridge, Co Kildare.

or

E-mail: annl.murphy@agriculture.gov.ie

Alternatively, Recommended Lists can be obtained from the Department of Agriculture, Food and the Marine website; www.agriculture.gov.ie where they can be found under the heading 'PUBLICATIONS'.

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