

Sugar Beet Varieties

Irish Recommended List 2006

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Requests for the Recommended List

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Recommended lists can be obtained from the Department of
Agriculture and Food website

www.agriculture.gov.ie

where they can be found under the heading 'PUBLICATIONS'.

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Sugar Beet Growing in Ireland

Sugar beet grows best in areas of Ireland with good tillage soils that allow early sowing and facilitate harvesting in the late autumn/early winter period without causing excessive soil compaction. Very light sandy soils will give reduced yields. Growing on heavy clay soils, particularly if they have underlying poor drainage, can delay sowing date and make harvesting difficult as well as causing damage to the soil structure. Heavy clay soils also have the disadvantage of increasing soil tare adhering to the roots after harvesting, thus increasing transport costs and reducing the price obtained for the crop.

To minimise the risk of sugar beet eelworm infestation, the crop is grown not more frequently than every third year in the rotation. Consequently, sugar beet is usually grown in rotation with other tillage crops, with the crop following sugar beet benefiting from the high level of fertiliser used on the beet crop.

In recent years, growers are moving to earlier sowing to exploit the associated yield advantages and this earlier sowing increases the importance of good bolting resistance.

Introduction to the Recommended List

This Recommended List leaflet contains a list of the sugar beet varieties that are considered most suitable for growing under Irish conditions.

The data presented, is based on the trial results over the three years 2002-2004, which have been combined in a single evaluation. Trials are sown in March and April, within commercial sugar beet crops and in accordance with good farming practice.

Variety Testing Procedure

Variety testing of Sugar beet is carried out by Teagasc on behalf of and under the supervision of the Department of Agriculture and Food.

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 trials on the farms of selected commercial

growers in the main sugar beet growing areas where they are assessed as to their suitability under Irish conditions for grower income, white sugar yield, root yield and other traits required by the sugar industry. In 2002 to 2004, the trial results are based on trials located in Cork (1), Wexford (2), Tipperary (1) and Kildare (1). The 2004 control varieties were Afton, Atlantis, Manhattan, Ocean, Oisín and Paloma. These controls have been applied retrospectively to the data from the 2003 and 2002 trials, and where applicable, to the data from the 2001 trials.

Varieties must be tested for a minimum of 3 years in combined National List / Recommended List trials before they can be considered for entry to the National Catalogue and the Recommended List.

Varietal resistance to bolting is assessed in the main trials and also in a special 'bolting' trial sown in the 1st week of March. This trial was grown in Carlow in 2002, Kildare in 2003 and Tipperary in 2004.

An Advisory Committee comprising representatives of the Department, Irish Sugar Ltd, Seed Agents, the Sugar Beet Section of the Irish Farmers Association, and Teagasc meet on an annual basis to discuss the trials.

After completing 3 years in the National List/Recommended List trials, new varieties showing superior performance are given positive Value for Cultivation and Use (V.C.U.) status and are nominated by the Advisory Committee for consideration for National Listing and Provisional Recommendation. If these Provisionally Recommended varieties continue to perform well, they may be proposed for Full Recommendation by the Advisory Committee after 1, 2 or occasionally 3 years further trialling.

The trial programme concentrates on determining the better varieties that will increase the economic return to the grower and facilitate efficient sugar extraction.

Laboratory Analysis

Quality analysis work is performed at the Irish Sugar Ltd laboratory at Carlow by staff from the agricultural advisory body Teagasc, Oakpark, Carlow. At harvest, sugar beet roots from the entire trial plot are bagged and transported to the laboratory where they are later washed, weighed and mechanically sampled. The extracted samples (known as 'brei') are analysed in the laboratory where determinations are made for the levels of the

following; Total Sugar Content, Potassium, Sodium and Amino-N. White sugar yield and total impurities are calculated from this data.

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 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. Fully recommended varieties which are being surpassed by newer improved varieties, are classified as **'Becoming Outclassed' (BO)** for one or two years, after which they are removed from the recommended list.

Resistance to Bolting

Varieties are assessed on the basis of bolting resistance in the early bolting trial sown very early in the season, and in the NL/RL variety trials sown at the normal sowing time. Bolting percentage results are presented in Table 1 and Table 2.

Considerable importance should be given to bolting resistance when choosing varieties because bolters not only reduce yield and quality, but are also costly to control or rogue, and if viable seed is set, the field will be less suitable for sugar beet production in future years. Where the infestation level with such seed is high, the field may have to be removed from sugar beet production.

For the area that they intend to sow early, growers should ensure that they select only varieties deemed suitable.

Root Yield and Sugar Content Matrix

On the basis of root yield and sugar content, varieties can be classified in breeding terms into five types;

E type. (E = Ertrag). **High (heavy) yield and low sugar %.** Referred to as 'Heavy type'.

NE type. Between the N type and E type.

N type (N = Normal). **Intermediate in root yield and sugar content.**

NZ type. Between the N type and Z type.

Z type. (Z = Zucker). **Low yield and high sugar %.** Referred to as 'Sweet type'.

Acknowledgements:

Sugar beet variety testing is carried out by Teagasc on behalf of and under the supervision of the Department of Agriculture and Food (DAF). DAF wish to acknowledge the help and co-operation received from Teagasc, Irish Sugar Ltd, the Irish Farmers Association, the seed agents and breeders, the Sugar Beet Variety Trials Advisory Committee, and the growers on whose land the trials were conducted.

Important notice: The Department of Agriculture and Food 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 of Agriculture and Food cannot, however, accept responsibility for any loss or inconvenience arising from any future variation in absolute or relative varietal performance.

Table 1. List of Fully Recommended Sugar Beet Varieties 2006

Varieties listed alphabetically	Ploidy: Diploid or Tetraploid	'Grower Income'	% of Controls Relative						Year First Recommended	
			Root Yield and (t/ha)	Relative Sugar Content and (% Sugar)	Total Impurities [Low is Best]	Early bolting trial Bolters %	Variety trials, Bolters %	Sowing date recommendation		Top Size 9=Good 1=Poor
Mean of controls		100	100 (78.2)	100 (17.7)	100	3.8	0.13	From	5.5	5.7
Afton (R)	T	101	101	100 (17.7)	105	5.3	0.14	Early April	5.4	5.7
Ariana (BO)	T	---	102	98 (17.3)	105	4.3	0.17	Early April	5.4	5.6
Atlantis (R)	T	102	100	101 (17.9)	100	5.0	0.10	Early April	5.3	5.9
Celt (R)	D	95	97	99 (17.4)	108	0.9	0.03	Mid-March*	5.1	5.6
Manhattan (R)	T	97	100	98 (17.3)	111	1.8	0.07	Mid-March*	5.4	5.3
Maverick (R)	D	102	102	100 (17.7)	97	5.2	0.03	Early April	5.5	5.5
Ocean (R)	T	102	100	101 (17.9)	96	4.0	0.18	Early April	5.4	5.4
Oisin (R)	T	102	102	100 (17.7)	96	3.3	0.11	Early April	5.4	5.8
Paloma (BO)	T	97	98	99 (17.6)	91	3.4	0.16	Early April	5.8	6.1
Roberta (R)	D	95	98	97 (17.2)	106	1.1	0.04	Mid-March*	4.8	4.6
Zulu (BO)	D	---	96	98 (17.4)	112	2.4	0.03	Mid-March*	5.0	5.7

* Early Sowing recommendation: the varieties Celt, Manhattan, Roberta and Zulu are particularly suitable for early sowing (from mid-March), due to their good resistance to bolting in early sown bolting trials.

Table 2. List of Provisionally Recommended Sugar Beet Varieties 2006

Varieties listed alphabetically	Ploidy: Diploid or Tetraploid	'Grower Income'	% of Controls Relative						Year First Recommended	
			Root Yield and (t/ha)	Relative Sugar Content and (% Sugar)	Total Impurities. [Low is Best]	Early bolting trial. Bolters %	Variety trials. Bolters %	Sowing date recommendation		Top Size 9=Good 1=Poor
Mean of 3 controls		100	100 (78.2)	100 (17.7)	100	3.8	0.13	From	5.5	5.7
Juvena (PR-1)	T	102	99	102 (18.0)	89	2.5	0.03	Early April	5.4	5.6

Notes re. Table 1 and Table 2:

The symbol (R) after the variety name, indicates a Full Recommendation, while (PR) indicates a Provisional Recommendation. The number after the PR, indicates the number of years provisionally recommended, and (BO) indicates a fully recommended variety which is Becoming Outclassed.

The Tables show the relative data for 'Grower Income', Root Yield, Sugar Content and Impurities Content. 'Grower Income' is derived by combining the Root Yield and the Sugar Content with the 'On Account' price paid for beet by the factory. In order to get a true picture of a variety's overall merit to the farmer, it is also necessary to take account of bolting in both the early bolting trial and the variety trials, top size and disease resistance.

Data relates to trials grown in the years 2002, 2003 and 2004, except for two varieties (Ariana and Zulu), which were not sown in 2004. For these, the 2001, 2002 and 2003 trial data was used, and the Grower Income figures are omitted. Actual sugar % for all varieties has been brought to the 2002 to 2004 standard. The 2004 control varieties were Afton, Atlantis, Manhattan, Ocean, Oisin and Paloma. These controls have been applied retrospectively to the data from the 2003 and 2002 trials, and where applicable, to the data from the 2001 trials.

Characteristics of the Varieties

Comments on the data relating to root yield, sugar content, impurities, bolting resistance in the early sown bolting trial, bolting resistance at normal sowing time, top size, and disease resistance are provided, except where the variety's performance for a particular trait is at or near the mean of all the recommended varieties.

Fully Recommended Varieties 2006

Descriptions are based on data shown in Table 1.

The fully recommended varieties for 2006 are: Afton, Ariana, Atlantis, Celt, Manhattan, Maverick, Ocean, Oisin, Paloma, Roberta and Zulu.

Fully recommended varieties with an '**early sowing recommendation**' are Celt, Manhattan, Roberta and Zulu.

Fully recommended varieties '**becoming outclassed**' are Ariana, Paloma and Zulu.

Variety

Details

Afton (R) Grower Income at 101 is good. Sugar content is very good. Suitable for sowing from early April. Bolting resistance at normal sowing period (variety trial data) matches the mean of the control varieties. Triploid variety.
Came onto the recommended list in 2003. Bred by Syngenta, Sweden.

Ariana (BO) Ariana is fully recommended but becoming outclassed. Root yield is very good but sugar content is only moderate. Impurity content is slightly high. Suitable for sowing from early April. Moderate bolting resistance at normal sowing period (variety trial data). Triploid variety.
Came onto recommended list in 2001. Bred by KWS, Germany.

Atlantis (R) Grower Income at 102 is very good. Sugar content is very good. Suitable for sowing from early April. Good bolting

resistance at normal sowing period (variety trial data). Triploid variety.

Came onto recommended list in 1998. Bred by Advanta (Van der Have), The Netherlands.

Celt (R) Grower Income at 95 is moderate. This is mainly due to its moderate yield. Impurity content is slightly high. Its very good bolting resistance when sown early (early bolting trial data) make it very suitable for early sowing. **Suitable for sowing from mid-March.** Also has very good bolting resistance at normal sowing period (variety trial data). Diploid variety with moderate top size. Erect growth habit.

Came onto recommended list in 1992. Bred by Syngenta, Sweden.

Manhattan (R) Grower Income at 97 is moderate. This is mainly due to its moderate sugar content. Impurity content is high. Its good bolting resistance when sown early (bolting trial data) make it suitable for early sowing. **Suitable for sowing from mid-March.** Also has good bolting resistance at normal sowing period (variety trial data). Triploid variety.

Came onto recommended list in 2000. Bred by Danisco, Denmark.

Maverick (R) Grower Income at 102 is very good. This is mainly due to its very good root yield. Impurity content is low. Suitable for sowing from early April. Very good bolting resistance at normal sowing period (variety trial data). Diploid variety.

Came onto the recommended list in 2005. Bred by Syngenta, Sweden.

Ocean (R) Grower Income at 102 is very good. This is mainly due to its very good sugar content. Impurity content is low. Suitable for sowing from early April. Moderate bolting resistance at normal sowing period (variety trial data). Triploid variety.

Came onto recommended list in 1999. Bred by Strube-Dieckmann, Germany.

- Oisin (R)** Grower Income at 102 is very good. This is mainly due to its very good root yield. Impurity content is low. Suitable for sowing from early April. Good bolting resistance at normal sowing period (variety trial data). Triploid variety. Came onto recommended list in 2002. Bred by Strube-Dieckmann, Germany.
- Paloma (BO)** Paloma is fully recommended but becoming outclassed. Grower Income at 97 is moderate. Root yield is moderate. Impurity content is very low. Suitable for sowing from early April. Moderate bolting resistance at normal sowing period (variety trial data). Very good top size and disease resistance. Triploid variety. Came onto recommended list in 2002. Bred by KWS, Germany.
- Roberta (R)** Grower Income at 95 is moderate. Root yield and sugar content are moderate. Impurity content is slightly high. Its very good bolting resistance when sown early (early bolting trial data) make it very suitable for early sowing. **Suitable for sowing from mid-March.** Also has very good bolting resistance at normal sowing period (variety trial data). Diploid variety with moderate top size and disease resistance. Came onto recommended list in 1999. Bred by KWS, Germany.
- Zulu (BO)** Zulu is fully recommended but becoming outclassed. Both root yield and sugar content are moderate. Impurity content is high. Its good bolting resistance when sown early (early bolting trial data) make it suitable for early sowing. **Suitable for sowing from mid-March.** Also has very good bolting resistance at normal sowing period (variety trial data). Diploid variety with only moderate top size. Came onto recommended list in 1994. Bred by Syngenta, Sweden.

Provisionally Recommended Varieties 2006

Description is based on data shown in Table 2.

Varieties: Juvena.

Variety

Details

Juvena (PR-1) Grower Income at 102 is very good. This is mainly due to its very good sugar content. Impurity content is very low. Suitable for sowing from early April. Very good bolting resistance at normal sowing period (variety trial data). Triploid variety.
New variety on the recommended list in 2006. Bred by KWS, Germany.

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