



National Institute of Agricultural Botany

REPORT FOR HDC

Crop : Spring Sown Bulb Onions
Project: : FV 99.
Year : 1993/94

Field Scale Adaptability
of Spring Sown Bulb Onion Varieties
Which Have Performed
Well in NIAB Trials

**FIELD SCALE BULK HANDLING ADAPTABILITY OF
SPRING BULB ONION VARIETIES**

WHICH HAVE PERFORMED WELL IN NIAB TRIALS

OBJECTIVE

To establish the suitability on a commercial scale of varieties of spring sown onions which have performed well in conventional NIAB trials by growing large scale plots on two farms, situated on both peat and silt in Cambridgeshire.

METHOD

Two trial sites were used for the trials but different varieties were grown at each:

Site	Soil type	Varieties tested	Drilling date	Harvest date	Date of storage assessment
1. Barway	Black Peat	Earlies	04.03.93	24.08.93	10.03.94 and 13.04.94
2. Leverington	Silt	Maincrop	05.03.93	15.09.03	10.05.94

The target population at Barway was 40 plants per square metre (400,000 pha). The achieved populations averaged 42 plants ppm² (see page 2). At Leverington the target was 48 plants per square metre and the achieved population 49 plants ppm². The trials were treated for pesticide and irrigation purposes in the same way as the commercial crop surrounding them. Maleic Hydrazide was applied to the trial at approximately 10% foliage diedown.

Produce from a measured length of bed was topped, windrowed and harvested into tonne boxes.

One tonne samples from each plot were then dried according to commercial practice. Samples from the Barway site were stored in ambient storage at Arthur Rickwood EHF whilst the produce from Leverington was stored in refrigerated storage at Hickmans in Wisbech.

Both sets of samples were removed from storage the following spring and graded over commercial graders and assessed for size, class, unmarketable fractions and bulb quality.

The bulbs from the early trial at Barway were kept for one month and re-assessed for sprouting in April.

RESULTS

LARGE SCALE ONION TRIAL 1993/94 Barway

1. POPULATION AND MATURITY

In order of maturity

Variety	% fallover on 5.8.93	Population plants m ²
Spirit	95	43
R-Sito	95	46
Crossbow	90	41
Django	80	38
Hamlet	70	48
Summit	65	42
Hyfast	60	39
Durco	10	42
Markies	5	35
Caribo	5	46
Mean	57	42

LARGE SCALE ONION TRIAL - 1993/94 Barway

2. ASSESSMENT OF TOTAL YIELD

Varieties in order of Total Yield

Variety	Total Yield (t/ha)	% Defects after Storage (10 March '94)						13.04.94
		Sprouted	Soft	Skinned	Rots	Undersized <40mm	Total % Unmarketable (by wt)	% sprouted
Hamlet	73.12	3	2	3	1	1	11	54
Durco	70.85	3	3	2	1	1	11	33
Summit	67.97	1	1	1	1	1	5	31
Crossbow	64.31	19	3	4	2	1	31	81
R-Sito	63.94	9	3	1	2	1	19	74
Django	61.40	7	5	4	1	2	25	58
Markies	56.78	5	2	2	1	1	13	57
Caribo	55.77	2	3	1	1	1	9	37
Hyfast	50.32	4	2	1	0	1	8	68
Spirit	49.01	1	3	1	1	1	7	83
Mean	61.35	5	3	2	1	1	14	53

LARGE SCALE ONION TRIAL 1993/94 Barway

3. ASSESSMENT OF MARKETABLE YIELD

Varieties in order of Total Yield

Variety	Marketable Yield (t/ha)				% Unmarketable (by weight)
	40-60mm diameter	60-80mm diameter	>80mm diameter	Total	
Hamlet	3.6	62.5	0	66.1	10.7
Durco	3.6	60.4	0	63.9	10.8
Summit	3.9	61.0	0	64.9	4.8
Crossbow	3.9	40.0	0	43.8	31.2
R-Sito	4.0	49.6	0.1	53.6	19.2
Django	3.4	45.7	0.2	49.3	24.7
Markies	6.1	44.4	0	50.4	12.6
Caribo	3.7	47.1	0.1	50.9	9.5
Hyfast	5.3	41.1	0.1	46.5	8.2
Spirit	3.0	42.6	0.2	45.8	7.1
Mean	4.1	49.4	0.1	53.5	13.9

LARGE SCALE ONION TRIAL 1993/94 Barway

4. ASSESSMENT OF BULB QUALITY

Varieties in order of total yield

Variety	Skin Colour (1-9) 1=pale 9=dark	Skin protection (1-9) 1=poor 9=good	Bulb shape (1-9) 1=flat 5=globe 9=elongate	Uniformity of bulb size and shape (1-9) 1=poor 9=good	Bulb firmness (1-9) 1=soft 9=firm
Hamlet	5.9	4.3	4.4	6	5.8
Durco	5.1	5.2	4.5	5	6.2
Summit	5.2	5.2	4.7	7	7.8
Crossbow	6.2	4.9	4.3	5	7.7
R-Sito	5.4	5.5	4.4	6	8.1
Django	6.4	4.6	5.0	5	6.9
Markies	6.7	5.3	4.5	6	6.4
Caribo	6.9	5.7	4.4	6	7.6
Hyfast	6.5	4.6	4.0	7	8.3
Spirit	6.4	5.3	3.9	7	8.2
Mean	6.1	5.1	4.4	6	7.3

LARGE SCALE ONION TRIAL - 1993/94 Leverington

1. ASSESSMENT OF MARKETABLE YIELD

Varieties in order of total marketable yield

Variety	Marketable Yield (t/ha)				% Unmarketable (by weight)
	40-60mm diameter	60-80mm diameter	>80mm diameter	Total	
Hystar	4.1	43.7	8.2	56.0	8.9
Durco	4.1	42.3	5.5	51.9	19.1
Sherpa	4.1	39.6	5.5	49.2	13.3
Hysam	2.7	31.4	13.7	47.8	14.6
Karato	4.1	36.9	6.8	47.8	10.2
Legio	4.1	34.2	8.2	46.5	19.0
Macho	4.1	30.1	12.3	46.5	12.8
Dinero	2.7	34.2	8.2	45.1	17.5
Caribo	4.1	28.7	4.1	41.0	18.9
TZ 8825	1.4	19.1	4.1	24.6	35.7
Mean	3.6	34.0	7.7	45.6	17.0

LARGE SCALE ONION TRIAL - 1993/94 Leverington

2. ASSESSMENT OF BULB QUALITY

Varieties in order of total marketable yield

Variety	Skin colour (1-9) 1=pale 9=dark	Skin protection (1-9) 1=poor 9=good	Bulb shape (1-9) 1=flat 5=globe 9=elongate	Uniformity of bulb size and shape (1-9) 1=poor 9=good	Bulb firmness (1-9) 1=soft 9=firm
Hystar	6	7	4.5	6	7
Durco	6	6	4.7	5	6
Sherpa	5	7	4.7	6	5
Hysam	7	7	4.7	5	5
Karato	5	6	4.3	5	6
Legio	4	5	4.7	6	5
Macho	5	5	4.3	5	6
Dinaro	4	4	4.5	5	6
Caribo	6	5	4.7	5	5
TZ8825	6	3	4.7	3	4
Mean	5.4	5.5	4.6	5.1	5.5

Comments on the trials

For the first time in this experiment different sets of varieties were grown at the two sites. Early maturing varieties were grown on the peat at Barway and maincrop varieties at Leverington on the silt.

Both trials were drilled in early March in dry conditions. The populations at Barway were below target, possibly due to some wind damage. At Leverington above average rainfall in April and May meant that germination and establishment were good.

Harvest was possible in August for the early varieties at Barway when weather conditions were reasonable. However, very wet weather in early September delayed harvest at Leverington. The trial was eventually harvested in mid September in very poor conditions. This encouraged the spread of neck rot - the major cause of unmarketability in this trial.

Produce from Barway was removed from store on 10 March for grading and assessment when sprouting was at the 5% level. Samples were kept until 13 April when sprouting of these early varieties increased to 58%.

The Leverington trial was stored until 10 May.

Comments on varieties

CARIBO and DURCO were included in both trials as controls.

Early Trial - Barway

SPIRIT (Bejo) Very early maturity. Low total yield. Very good sprouting resistance but sprouted quickly after removal from store. Low levels of waste. Bulb quality was good with mid to dark colour, good uniformity and firmness.

RIJNSBURGER-SITO (Nickerson) Very early maturity. Above average total yield. Above average level of sprouting by March and very high by April. Average marketable yield. Mid straw coloured skin. Good skin protection and firmness.

CROSSBOW (Elsoms/HRI-Wellesbourne) Early maturity. Above average total yield. High level of sprouting and skinned bulbs which reduced the marketable yield in March. Average bulb quality.

DJANGO (Van der Have) Early maturity. Average total yield from below average population. Some sprouting in March with some soft and skinned bulbs. Moderate bulb quality. Good shape.

HAMLET (Nickerson) Very high total and marketable yields from high population. Skin protection and bulb firmness below average.

SUMMIT (Bejo) Mid-maturity in this trial. High total and marketable yields with very few unmarketable bulbs. Skin mid straw colour. Good shape, uniformity and firmness.

HYFAST (Bejo) Mid-maturity. Low total yield. Few unmarketable bulbs in March but still below average marketable yield. Medium dark skin colour. Good uniformity and firmness but skin protection below average.

DURCO (Sluis en Groot) Late maturity in this trial. Very high total and marketable yields, few unmarketable bulbs. Medium straw coloured bulbs with average quality.

MARKIES (Van der Have) Late maturity in this trial. Below average total yield from low population. Medium dark skin with below average firmness.

CARIBO (Sluis en Groot) Late maturity relative to other varieties in this trial. Below average total yield. Low levels of unmarketable bulbs. Medium dark bulb colour. Good quality.

Late Trial - Leverington

HYSTAR (Bejo) Above average yield of mid to dark straw coloured, flat to globe shaped, firm bulbs with good skin protection. Above average % marketable. Bright, attractive sample with little skin staining. Main reason for unmarketability - skinning.

DURCO (Sluis en Groot) Above average yield of mid to dark straw coloured, flat to globe shaped bulbs with moderate skin protection. Susceptible to skin staining. Main reasons for unmarketability (in order of importance) - Neck rot, skinning and watery scale.

SHERPA (Van der Have) Above average yield of mid straw coloured, flat to globe shaped bulbs with good skin protection. Above average % marketable. Like HYSTAR a clean, bright, attractive sample. Main reasons for unmarketability (in order of importance) - Skinning and neck rot.

HYSAM (Bejo) Dark straw coloured, flat to globe shaped bulbs with good skin protection. Skins susceptible to staining giving the sample an overall dull appearance. Main reasons for marketability (in order of importance) - Neck rot and watery scale.

KARATO (Sluis en Groot) Mid straw coloured, rather flat shaped bulbs with moderate skin protection. Above average % marketable. Reasonably attractive and bright sample but let down rather by skin splitting. Main reasons for unmarketability (in order of importance) - Neck rot, skinning and double bulbs.

LEGIO (Nickersons) Pale to mid straw coloured, flat to globe shaped bulbs with moderate skin protection. Susceptible to skin staining. Main reasons for unmarketability (in order of importance) - Neck rot, watery scale and skinning.

MACHO (Nickersons) Mid straw coloured, rather flat shaped bulbs with moderate skin protection. Reasonably bright, clean sample with little staining but some skin splitting. Main reasons for marketability (in order of importance) - Neck rot and skinning.

DINARO (Royal Sluis) Pale to mid straw coloured, flat to globe shaped bulbs with below average skin protection. Susceptible to skin staining and splitting. Main reasons for unmarketability (in order of importance) - Neck rot and skinning.

CARIBO (Sluis en Groot) Below average yields of mid to dark straw coloured, flat to globe shaped bulbs with moderate skin protection. Prone to skin staining and splitting. Main reasons for unmarketability (in order of importance) - Neck rot and skinning.

TZ 8825 (A L Tozer/HRI Wellesbourne) Below average yields of mid to dark straw coloured, flat to globe shaped bulbs with below average skin protection and bulb firmness. Heavily stained bulbs prone to skin splitting. Main reasons for unmarketability (in order of importance) - Neck rot, skinning, compression damage and double bulbs.

Conclusion

- a) Earlies HAMLET, SUMMIT and DJANGO had the best combination of yield and quality. SPIRIT and R-SITO had good bulb quality.
- b) Maincrops HYSTAR, SHERPA AND HYSAM had good combinations of yield and quality. TZ 8825 did not store well.
- c) Controls DURCO had better yield and quality than CARIBO in both trials.