

**Project title:** Horticulture Strategic Centres for Field Vegetables – carrot demonstration variety trials, seed size and carrot breakage trials

**Project number:** FV 462

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**Report:** Annual Report 2019

**Previous report:** n/a

**Key staff:** NIAB, PGRO, ADAS, Duchy College

**Location of project:** Yorkshire

**Industry Representative:**

**Date project commenced:** 01 April 2019

**Date project completed (or expected completion date):** 31 Mar 2020

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*The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.*

## **Carrot demonstration and variety trials**

The Carrot Demonstration Day, organised by BCGA in October is an annual event which is usually attended by over 200 visitors, exhibitors and seedsman - just about the whole UK carrot industry. The event is an ideal opportunity for growers to bring themselves up to speed with the latest developments.

In 2019 there were 75 different varieties from 8 different seed companies, a selection tested for breakage characteristics. In addition to the trials there were trade stands showcasing products and services.

British Carrot Growers Chairman, Rodger Hobson said "This unique event brings together grower, packers and the wider carrot industry to see the latest developments in varieties and machinery. It has something for everyone and with the numbers attending it shows how important it is for UK carrots. In my opinion this is the best event we have ever held."

## **2019 Additional carrot trials and KE events**

- carrot breakage
- seed size v sowing depth trial

## Carrot breakage

A selection of varieties were screened to see how prone to breakage they were. The screening was conducted the day after harvest and is only an indication of variety breakage performance.

As only a small sample of each variety was tested it is only possible to loosely group the varieties. The following performed as well as or better than Nairobi in the breakage test.

Carrot varieties in the first column had no breakages.

variety	company
CA 4031 F1 (Berdina)	Agriseeds
CA 6572 F1	Agriseeds
Caribou	Agility Ag / Seminis
Octavo	Hazera
Olimpo	Hazera
Polydor	Clause
Stromboli	Clause
Nerac	Elsoms

variety	company
Nun 13098	BASF
Nun 13096	BASF
Melodio	Hazera
Eskimo	Hazera
Volcano	Hazera
Octavo	Hazera
VAC111	Hazera
Fidra RZ	Rijk Zwaan
SVDN 5865	Agility Ag / Seminis
Elegance	BASF

variety	company
Nun 13095	BASF
Speedo	Hazera
Melodio	Hazera
Nairobi	Elsoms
CA 98-681 (Calantis)	Agriseeds
Romance	BASF
Laguna	BASF
Nipomo	Elsoms
Naval	Elsoms
Nazareth	Elsoms

## Carrot seed size v sowing depth trial

Growers face many challenges and establishing the crop is not always simple to achieve. When a grower has selected a variety they then need to source that seed and may be faced with a seed size grade bigger or small than hoped for...

Ideally seed should be drilled down into some moisture but not too deep or shallow!

The replicated trial investigated 1 variety (from a single production batch), 3 different seed sizes (1.6-1.8mm, 1.8-2.0mm, 2.2-2.4mm) drilled at 3 different depths (shallow 10-12mm, 'normal' 15-18mm and deep 20-24mm).

The trial was drilled, 7th May, into a good seedbed in fine conditions followed immediately by rain. Early vigour and ground cover were recorded. The plots were taken to yield and graded.

## Results

		June	June	June	June	July	July	Oct	Oct	Oct
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seed size	drilling depth	vigour 9=5TL 15-18 cm tall 5=3-4TL 10-12cm 1=2TL 5cm	uniformity of vigour 9=good, 1=poor	establishment 9=90%, 1=10%	Ground cover %	vigour 9=6t.l. & 30cm tall. 6=5t.l. & 25cm tall	Ground cover %	Population m/ha	yield t/ha >20mm	yield t/ha >30mm
small	shallow	3.0	2.7	7.0	18	5.3	50	0.92	88.5	59.2
small	normal	6.3	6.7	7.7	37	8.3	73	1.27	109.3	63.6
small	deep	5.7	6.7	7.7	37	8.0	78	0.94	91.1	53.7
medium	shallow	4.3	3.7	6.7	25	7.0	63	1.01	97.4	64.8
medium	normal	6.0	6.3	8.3	38	8.7	83	1.2	108.8	64.4
medium	deep	5.7	6.7	7.3	37	8.3	77	0.98	100.2	64.1
large	shallow	5.0	3.3	7.0	27	7.0	63	1.14	93.6	55.2
large	normal	7.3	7.0	8.0	45	9.0	82	1.23	103.0	56.1
large	deep	7.3	6.7	8.0	38	8.0	73	1.03	93.2	49.7
small	all depths	5.0	5.3	7.4	31	7.2	67	1.04	96.3	58.8
medium	all depths	5.3	5.6	7.4	33	8.0	74	1.07	102.1	64.5
large	all depths	6.6	5.7	7.7	37	8.0	73	1.13	96.6	53.7
all sizes	shallow	4.1	3.2	6.9	23	6.4	59	1.02	93.1	59.7
all sizes	normal	6.6	6.7	8.0	40	8.7	79	1.23	107.0	61.4
all sizes	deep	6.2	6.7	7.7	37	8.1	76	0.98	94.8	55.8

Unsurprisingly the larger seeds had more vigour and had greater uniformity in the vigour. Similarly the large seeds had the best establishment.

The vigour, uniformity of vigour and establishment were lowest for the shallow sown seed. Ground cover followed the same pattern with the larger seed giving better cover. The shallow sowing being the least ground cover.

The small seed and shallow sown crop had bigger foliage size and quality at crop maturity. Both had higher crown heights than the medium seed or seed sown at the normal depth.

The harvest populations were greater the larger the seed used however the yield was greatest for the medium sized seed.

Harvest populations were lower where the seed had been shallow or deep sown. This was reflected in the yields being lower at these depths.

There was a tendency towards more defects in the graded samples from small seeded plots. There were fewer defects in the plots sown at normal depths. There were more 'green tops' in the shallow sown plots.

**Smaller seed sizes potentially need more attention at sowing; larger seed doesn't automatically mean bigger yields; and drilling down into some moisture is essential - but only if it isn't too deep!**