

Yields from *phaseolus coccineus* grown with apical dominance  
curbed to grow partly horizontal.

## Trial in England, Scotland and Wales 2023 – A Paper

Anthony Boyd 2024

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## ABSTRACT

### OBJECTIVE OF TRIAL

To investigate the extent to which:

- (1) a climbing runner bean plant grown part horizontally on a frame may be expected to produce a yield per plant at the level of a recognised normal yield for those grown on an A-frame or teepee – that is 1,000 g per plant.
- (2) yields per plant may change when:
  - (a) two plants grown on a frame.
  - (b) liquid fertilisers used.
  - (c) one dwarf runner bean plant is grown as companion plant.

### MATERIALS AND METHODS

Support frames, seeds, directions for assembly of frame, and instructions for cultivation were sent to 66 volunteer growers in England, Scotland, and Wales. Yields were correctly reported by 24 growers (36.4%).

### SUMMARY OF DATA (YIELDS)

#### Group (1) Mean yield per plant: Number of plants: 58

|   |  |
|---|--|
| Set (1) Frames with single plant (17 frames): | 1,926 g (92.6% above accepted average) |
| (2) Frames with two plants (17 frames):       | 1,322 g (22.2% above accepted average) |
| (3) Frames with two plants (24 frames*):      | 1,357 g (35.7% above accepted average) |

#### Group (2) Mean yield per plant: Number of plants: 54

|  |  |
|--|--|
| (4) Frames with two plants and Hestia (9 frames):            | 1,209 g (20.9% above accepted average) |
| (5) Frames with two plants, Hestia, and Tomorite (9 frames): | 1,499 g (49.9% above accepted average) |
| (6) Frames with two plants, Hestia and Neudorff (9 frames):  | 1,193 g (19.3% above accepted average) |

Yields from Hestia negligible.

For the full report (All yields All growers) visit [www.LoopGrow.co.uk](http://www.LoopGrow.co.uk)

### CONCLUSIONS

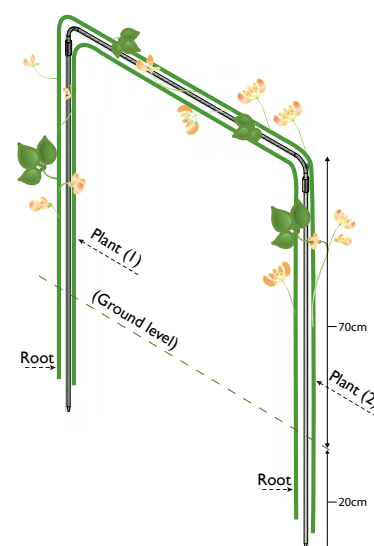
- (1) Around double accepted average yield per plant may be expected when grown singly on the frame (per frame/plant 1,926 g)
- (2) A yield per plant (1,357 g) – 36% above accepted average may be expected when grown two plants on the frame (per frame 2,714 g)

### OBSERVATIONS

- (1) Yields without exception exceeded normal yields.
- (2) Yield per plant when two plants grown on a frame was 30% less than when grown one on a frame.
- (3) Yield was boosted significantly when Tomorite® liquid fertiliser used.
- (4) Use of Neudorff® organic fertiliser did not boost yields.
- (5) Growing dwarf runner beans as companion plants was unsuccessful and made little or no contribution to yield per frame.

See right for diagram of frame with two plants:

Anthony Boyd, August 2024



YIELDS FROM *PHASEOLUS COCCINEUS* GROWN WITH  
APICAL DOMINANCE CURBED TO GROW PARTLY HORIZONTAL

**1. OBJECTIVE OF TRIAL**

To investigate the extent to which:

- (1) a climbing runner bean plant grown part horizontally on a cane may be expected to produce a yield per plant at the level of a recognised normal yield for those grown on an A-frame or Teepee – that is 1,000 g per plant (see references attachment (1)) . . .
- (2) yields per plant may change when:
  - (a) two plants grown on a frame.
  - (b) liquid fertilisers used.
  - (c) one dwarf runner bean plant is grown as companion plant.

**2. BACKGROUND**

2.1. Age group 65 and over accounts for an increasing proportion of the UK population – in 2021 an increase of 52% over 1981. Those of this age group engaged in gardening and wishing to carry on may welcome a growing system, which is physically less demanding than methods commonly used. Easier systems for growing vegetables generally – “no dig” – “no weeding” are “on trend”.

Using an A-frame or teepee is (a) impossible for those who cannot stand and (b) hard for those who prefer not to remain standing.

2.2. Runner beans were found to be the vegetable grown by the most gardeners (75%) in a *Which? Gardening* survey 2023.

2.3. Design began on the design of a runner bean support frame, which would enable a gardener to carry out all operations from beginning to end while seated – the plants growing no higher than the height of a table.

2.4. This would be achieved with a looped frame of metal bars – the verticals set at the desired height (See 2.3) and the horizontal providing the further growing distance required.

2.5. Total growing distance would match the average length of vertical canes in A Frames and Teepees – commonly 180–240 cm – median 210 cm.

2.6 Correspondence with experts indicated it would be worthwhile to determine whether plants grown in this way might produce yields higher than when grown conventionally – less energy being required for horizontal than for vertical development.

If found correct, this would be of interest across all ages in the gardening community.

(See References Attachment (2) Hessayon and Westland Garden Health given verbatim.)

There are references in the literature to this approach when growing fruit (see References Attachment (3) Lori, Riddel, Thomas).

2.7 In 2021 three volunteer gardeners (Stenhouse Scotland (2), North Bournemouth Dorset (1)) used the system to grow runner beans. Mean yields per plant were:

Stenhouse, 1,906 g; North Bournemouth, 1,550 g

These results taken with favourable comment on the sample metal frame in returned questionnaires led to setting up the present trial with a larger number of growers across the UK in 2023.

### 3. RECRUITMENT OF VOLUNTEER GROWERS – DISTRIBUTION OF MATERIALS AND INSTRUCTIONS, FEEDBACK

- 3.1. See page 7 for list of volunteers, number of frames each, and where located (map)
- 3.2. How recruited
  - (a) Contacting gardening club Secretaries.
  - (b) Personal contacts – local – Berkshire
  - (c) Circulars from county organisers National Vegetable Society and Allotment Associations
  - (d) Advertisements in *Simply Vegetables* and National Allotment Society magazine.The majority of respondents were allotment plot-holders.

#### 3.3. Distribution of materials and instructions

##### 3.3.1. Materials

Volunteers received two or more frames – the objective being to have as many different frames on trial as volunteers could handle (See 3.1. above and 4.1 (a) and (b) below).

##### 3.3.2. Instructions

Each volunteer received:

- (a) Directions for assembly of frame
- (b) Guidance on cultivation See Attachment (4) including timing of sowing/planting out seedlings, and harvesting (pick as soon as pods reach 20 cm length).
- (c) Record of yields form Examples of completed Records of Yields forms. See Attachment (5).
- (d) Questionnaire Examples of completed questionnaires. Attachment (6).

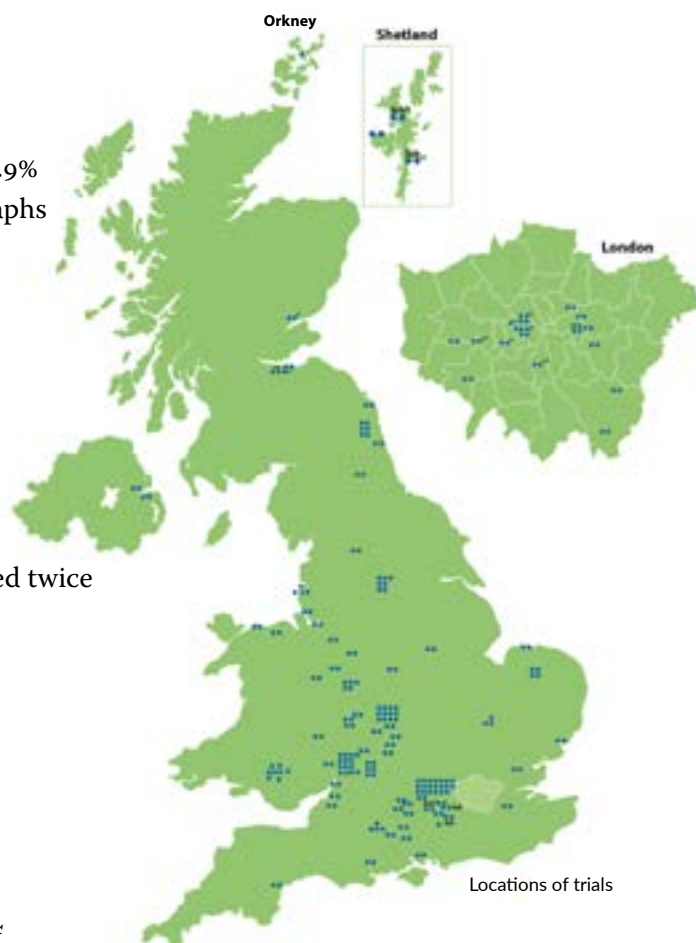
##### 3.3.3. Feedback

Summary below:

- Respondents received frames 66
- Respondents sent reports of yields 24: 36.4%
- Respondents returned questionnaires 29: 43.9%
- See Attachment (9) for selection of photographs

### 4. SCHEME OF TRIAL

- 4.1. Five sets in two groups.
  - (a) **Group (1)** for Trial Objective (1) – (See 1. (1). earlier.)
    - Set (1) one runner bean plant
    - Set (2) two runner bean plantsNote in Results Section (6) Set (2) is tabulated twice
    - (a) All growers Set (2)
    - (b) Same growers as Set (1) – Set 2(a).



(b) **Group (2)** for trial Objective (2) – See 1. (2) earlier.

Set (3) Two climbing runner beans plants, one dwarf runner bean plant.

Set (4) " " with Tomorite® liquid fertiliser

Set (5) Two climbing runner beans plants, one dwarf runner bean plant with Neudorff® liquid fertiliser (organic)

All sets same growers.

4.2. Total number of plants in trial: Climbing runner beans: 119

Dwarf runner beans: 54

See TABLE (1) on Page 7 for all Sets – growers, data

## 5. FRAME, PLANTS, GROWING MEDIA

5.1. Frame

(a) Same metal frame as used in 2021 (See 2.7)

(Also see Photos in Attachment 8)

(b) Measurements

Length vertical above ground: 65.0 cm

Length horizontal: 80.0 cm

Ratio vertical/horizontal: 1/1.2

Total growing distance: 210 cm (2,100 mm)

5.2. Plants

(a) Climbing runner bean “Benchmaster”

“Best Buy” in *Which? Gardening* 2023.

Same variety as grown in 2061 pilot trial (See 2.7)

(b) Dwarf runner bean “Hestia”.

Recommended in standard gardening text book . . .

*The New Vegetable & Herb Expert* Dr. D. G. Hessayon, Transworld Publishers 2014

5.3. Liquid fertilisers

(a) Tomorite®.

Outstanding yields in previous trial grown with dwarf runners Hestia

1 kg per plant, see letter (published *Simply Vegetables*, April 2020 (Boyd)).

(b) Neudorff® (organic) Known brand

## 6. RESULTS

### 6.1. Tables of results (pp 7–9)

Table (1) – All growers, all data

Table (2) – Summarised – Yields by Sets and by Groups

Table (3) – Number of values, percent above 1,000 g

In Table (2) yields from Groups and sets within groups are compared. The Comparisons in all cases are between results from the same growers, with one exception – See Set (1) *vs* Set (2).

In Table (1), the second set in the trial has two columns of values – 2 and 2(a). Set (2) figures are from all growers in the second set in the trial. Set 2(a) figures are from the same growers as Set (1) thus enabling like for like comparison with Set (1).

### 6.2. **Concerning Trial Objective (1)** – Yields *vs* recognised normal yield

(a) Single Benchmaster on a frame (Set (1) – mean yield 1,926 g – highest in trial. Also to note:

(b) All Benchmaster across all frames (Sets) (1) – (5) mean yield 1,412 g (total yield all plants 168 kg).

(c) Set with lowest Benchmaster yield (Set (5)) – mean yield 1,193 g

(d) Per **frame** average yield across all **frames** 2,471 g

(e) Overall, 69% of values (yields per plant) above 1,000 g – Table (3)

### 6.3. **Concerning Trial Objective (2a)** – Yields two plants *vs* one plant on a frame

(a) Growing two Benchmaster plants produced 1,357 g per plant (Set (2) compared with 1,926 g per plant when grown singly (Set (1) = reduction of 29.5%.

(b) Growing two plants produced 1,322 g per plant taking only results from same growers in Set (1) – Shown as 2(a) results – a reduction of 31.4% against yield from one plant. When grown two plants on a frame, the intensity of the light reaching each plant is less than when one plant grown – possibly the reason why yield per plant is less.

(c) Growing two plants on a frame increased yield per **frame** from 1,926 g to 2,644 g (same growers).

### 6.4. **Concerning Trial Objective (2b)** – Use of liquid fertilisers

(a) Set (4) (two plants per frame) ) using Tomorite® second highest yield per plant (1,499 g) in the trial.

(b) Mean yield per plant for the two plant sets (Group (2)) – Sets (3) and (5) *not* using Tomorite was 1,300 g.

(c) Set (5) (two plants per frame) with Neudorff had the lowest yield per plant in the trial.

### 6.5. Concerning Trial Objective 2(c) – Companion dwarf runner

(a) Yields from the dwarf runners were negligible – in most cases zero yield.

(b) Growers reported dwarf runner yields compromised by overshadowing.

Table (1) All growers, all data

Group One One Cultivar (Benchmaster F1) No Companion Planting, No Fertiliser.

| Grower        | Area            | Set (1)<br>Benchmaster – One plant |           |              |              |                  | Set (2a)<br>Benchmaster – Two plants<br>Same growers as Set (1) |           |              |              |                  | Set (2)<br>Benchmaster – Two plants<br>All growers |           |              |              |                  |
|---------------|-----------------|------------------------------------|-----------|--------------|--------------|------------------|---|-----------|--------------|--------------|------------------|--|-----------|--------------|--------------|------------------|
|               |                 | Crop weight                        | Frames    | Weight/frame | Plants/frame | Weight per plant | Crop weight   | Frames    | Weight/frame | Plants/frame | Weight per plant | Crop weight  | Frames    | Weight/frame | Plants/frame | Weight per plant |
| Acquah        | Worcestershire  | 2162                               | 1         | 2162         | 1            | 2162             | 4812  | 1         | 4812         | 2            | 2406             | 812  | 1         | 4812         | 2            | 2406             |
| Cummins       | Wiltshire       | 938                                | 1         | 938          | 1            | 938              | 3201  | 1         | 3201         | 2            | 1601             | 3201   | 1         | 3201         | 2            | 1601             |
| Gillard       | Berkshire       | 821                                | 1         | 821          | 1            | 821              | 2875  | 1         | 2875         | 2            | 1438             | 2875   | 1         | 2875         | 2            | 1438             |
| Lawrence      | Wiltshire       | 3562                               | 1         | 3562         | 1            | 3562             | 3201  | 1         | 3201         | 2            | 1600             | 3201   | 1         | 3201         | 2            | 1600             |
| Mathison      | Wiltshire       |                                    |           |              |              |                  |   |           |              |              |                  | 3064   | 1         | 3064         | 2            | 1532             |
| Mathison      | Wiltshire       |                                    |           |              |              |                  |   |           |              |              |                  | 2688   | 1         | 2888         | 2            | 1444             |
| Morton        | Berkshire       | 1748                               | 1         | 1748         | 1            | 1748             | 1795  | 1         | 1795         | 2            | 898              | 1795   | 1         | 1795         | 2            | 898              |
| Necar         | Warwickshire    | 3618                               | 1         | 3618         | 1            | 3618             | 3165  | 1         | 3165         | 2            | 1583             | 3165   | 1         | 3165         | 2            | 1583             |
| Nurcombe      | Bristol         | 968                                | 1         | 968          | 1            | 968              | 2862  | 1         | 2862         | 2            | 1431             | 2862   | 1         | 2862         | 2            | 1431             |
| Oldham        | Treorchy        |                                    |           |              |              |                  |   |           |              |              |                  | 4810   | 1         | 4810         | 2            | 2405             |
| Rains         | Dorset          |                                    |           |              |              |                  |   |           |              |              |                  | 3348   | 1         | 3348         | 2            | 1674             |
| Reader        | Devon           | 550                                | 1         | 550          | 1            | 550              | 558   | 1         | 558          | 2            | 279              | 558  | 1         | 558          | 2            | 279              |
| Reeve         | Edinburgh       | 2943                               | 1         | 2943         | 1            | 2943             | 2727  | 1         | 2727         | 2            | 1364             | 2727   | 1         | 2727         | 2            | 1364             |
| Robinson      | Yorkshire       | 2321                               | 1         | 2321         | 1            | 2321             | 2063  | 1         | 2063         | 2            | 1032             | 2063   | 1         | 2063         | 2            | 1032             |
| Rouse         | Hampshire       | 3947                               | 1         | 3947         | 1            | 3947             | 3278  | 1         | 3278         | 2            | 1639             | 3278   | 1         | 3278         | 2            | 1639             |
| Rouse         | Hampshire       | 1851                               | 1         | 1851         | 1            | 1851             | 2946  | 1         | 2946         | 2            | 1473             | 2946   | 1         | 2946         | 2            | 1473             |
| Russel        | Edinburgh       | 2279                               | 1         | 2279         | 1            | 2279             | 3357  | 1         | 3357         | 2            | 1679             | 3357   | 1         | 3357         | 2            | 1679             |
| Saunders      | Oxfordshire     | 1075                               | 1         | 1075         | 1            | 1075             | 2356  | 1         | 2356         | 2            | 1178             | 2356   | 1         | 2356         | 2            | 1178             |
| Skeffington   | Cambridge       | 2125                               | 1         | 2125         | 1            | 2125             | 1708  | 1         | 1708         | 2            | 854              | 1708   | 1         | 1708         | 2            | 854              |
| Small         | Hampshire       | 726                                | 1         | 726          | 1            | 726              | 1555  | 1         | 1655         | 2            | 778              | 1555   | 1         | 1655         | 2            | 778              |
| Starkie       | Berkshire       | 1102                               | 1         | 1102         | 1            | 1102             | 2490  | 1         | 2490         | 2            | 1245             | 2490   | 1         | 2490         | 2            | 1245             |
| Wakeling      | Orkney (school) |                                    |           |              |              |                  |   |           |              |              |                  | 1502   | 1         | 1502         | 2            | 751              |
| Wakeling      | Orkney (farm)   |                                    |           |              |              |                  |   |           |              |              |                  | 2631   | 1         | 2631         | 2            | 1316             |
| Wakeling      | Orkney (farm)   |                                    |           |              |              |                  |   |           |              |              |                  | 2110   | 1         | 2110         | 2            | 1055             |
| <b>Totals</b> |                 | <b>32736</b>                       | <b>17</b> | <b>1926</b>  | <b>17</b>    | <b>1926</b>      | <b>44949</b>  | <b>17</b> | <b>2644</b>  | <b>34</b>    | <b>1322</b>      | <b>65102</b>                                       | <b>24</b> | <b>2713</b>  | <b>48</b>    | <b>1357</b>      |

Group Two. Group One With Additional Elements (Companion Plant, Fertilisers)

| Grower        | Area            | Set (3)<br>Benchmaster – Two plants<br>Hestia – One plant |          |              |              |                  | Set (4)<br>Benchmaster – Two plants<br>Hestia – One plant<br>Fertiliser – Tomorite<br>Same growers as Set (3) |          |              |              |                  | Set (5)<br>Benchmaster – Two plants<br>Hestia – One plant<br>Fertiliser – Neudorff<br>Same growers as Set (3) |          |              |              |                  |
|---------------|-----------------|---|----------|--------------|--------------|------------------|---|----------|--------------|--------------|------------------|---|----------|--------------|--------------|------------------|
|               |                 | Crop weight   | Frames   | Weight/frame | Plants/frame | Weight per plant | Crop weight   | Frames   | Weight/frame | Plants/frame | Weight per plant | Crop weight   | Frames   | Weight/frame | Plants/frame | Weight per plant |
| Morton        | Berkshire       | 1551  | 1        | 1551         | 2            | 776              | 1746  | 1        | 1746         | 2            | 873              | 1325  | 1        | 1325         | 2            | 663              |
| Necar         | Warwickshire    | 2537  | 1        | 2537         | 2            | 1269             | 2663  | 1        | 2663         | 2            | 1332             | 2784  | 1        | 2784         | 2            | 1392             |
| Nurcombe      | Bristol         |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Oldham        | Treorchy        |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Rains         | Dorset          | 3766  | 1        | 3766         | 2            | 1883             | 4770  | 1        | 4770         | 2            | 2385             | 3615  | 1        | 3615         | 2            | 1808             |
| Reader        | Devon           | 482   | 1        | 482          | 2            | 241              | 1706  | 1        | 1706         | 2            | 853              | 1068  | 1        | 1068         | 2            | 534              |
| Reeve         | Edinburgh       | 2727  | 1        | 2727         | 2            | 1366             | 4876  | 1        | 4876         | 2            | 2438             | 3877  | 1        | 3877         | 2            | 1939             |
| Robinson      | Yorkshire       | 3055  | 1        | 3055         | 2            | 1528             | 4534  | 1        | 4534         | 2            | 2267             | 2919  | 1        | 2919         | 2            | 1460             |
| Rouse         | Hampshire       |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Rouse         | Hampshire       |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Russel        | Edinburgh       | 3812  | 1        | 3812         | 2            | 1906             | 3619  | 1        | 3619         | 2            | 1810             | 3079  | 1        | 3079         | 2            | 1540             |
| Saunders      | Oxfordshire     |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Skeffington   | Cambridge       | 1380  | 1        | 1380         | 2            | 680              | 1323  | 1        | 1323         | 2            | 662              | 1095  | 1        | 1095         | 2            | 548              |
| Small         | Hampshire       |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Starkie       | Berkshire       | 2444  | 1        | 2444         | 2            | 1222             | 1746  | 1        | 1746         | 2            | 873              | 716   | 1        | 1716         | 2            | 858              |
| Wakeling      | Orkney (school) |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Wakeling      | Orkney (farm)   |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| Wakeling      | Orkney (farm)   |   |          |              |              |                  |   |          |              |              |                  |   |          |              |              |                  |
| <b>Totals</b> |                 | <b>21754</b>  | <b>9</b> | <b>21754</b> | <b>18</b>    | <b>1209</b>      | <b>26983</b>  | <b>9</b> | <b>2998</b>  | <b>18</b>    | <b>1499</b>      | <b>21478</b>  | <b>9</b> | <b>2386</b>  | <b>18</b>    | <b>1193</b>      |

Table (2) Summarised – Yields by Sets and by Groups

Summary 1  
Actual Yields – Set – Mean per Frame – Mean per Plant

| Set          | Crop           | Per Frame     | Per Plant     | Frames    | Plants     |
|--------------|----------------|---------------|---------------|-----------|------------|
| 1            | 32,736         | 1,926         | 1,926         | 17        | 17         |
| 2            | 65,102         | 2,713         | 1,357         | 24        | 48         |
| 3            | 21,754         | 2,417         | 1,209         | 9         | 18         |
| 4            | 26,983         | 2,988         | 1,499         | 9         | 18         |
| 5            | 21,478         | 2,386         | 1,193         | 9         | 18         |
| <b>TOTAL</b> | <b>168,053</b> | <b>2,471*</b> | <b>1,412*</b> | <b>68</b> | <b>119</b> |

Analysis of Yields for Comparison  
Summary 2

Group (1) Each Set Same Growers

| Set          | Crop          | Per Frame     | Per Plant     | Frames    | Plants    |
|--------------|---------------|---------------|---------------|-----------|-----------|
| 1            | 32,736        | 1,926         | 1,926         | 17        | 17        |
| 2(a)         | 44,949        | 2,644         | 1,322         | 17        | 34        |
| <b>TOTAL</b> | <b>77,685</b> | <b>2,285*</b> | <b>1,523*</b> | <b>34</b> | <b>51</b> |

Summary 3

Group (1) All Growers

| Set          | Crop          | Per Frame     | Per Plant     | Frames    | Plants    |
|--------------|---------------|---------------|---------------|-----------|-----------|
| 1            | 32,736        | 1,926         | 1,926         | 17        | 17        |
| 2            | 65,102        | 2,713         | 1,357         | 24        | 48        |
| <b>TOTAL</b> | <b>97,838</b> | <b>2,319*</b> | <b>1,614*</b> | <b>41</b> | <b>65</b> |

Summary 4

Group (2) Each Set Same Growers

| Set          | Crop          | Per Frame     | Per Plant     | Frames    | Plants    |
|--------------|---------------|---------------|---------------|-----------|-----------|
| 3            | 21,754        | 2,417         | 1,209         | 9         | 18        |
| 4            | 26,983        | 2,998         | 1,499         | 9         | 18        |
| 5            | 21,478        | 2,386         | 1,193         | 9         | 18        |
| <b>TOTAL</b> | <b>70,215</b> | <b>2,600*</b> | <b>1,300*</b> | <b>27</b> | <b>54</b> |

\* Total crop ÷ Total frames and by total plants.

Table (3) – Number of values, percent above 1,000 g

By Set – Number Of Values (Yield Figures ACTUAL)

| Set           | Values Number |  | Above 1,000 g |             | Above 1,500 g |             | Above 2,000 g |             |
|---------------|---------------|--|---------------|-------------|---------------|-------------|---------------|-------------|
|               | Total         |  | Number        | %           | Number        | %           | Number        | %           |
| 1             | 17            |  | 12            | 70.6        | 10            | 58.8        | 8             | 47.1        |
| 2             | 24            |  | 19            | 79.2        | 9             | 37.5        | 2             | 8.3         |
| 3             | 9             |  | 6             | 66.7        | 4             | 44.4        | 0             | 0           |
| 4             | 9             |  | 5             | 55.5        | 4             | 44.4        | 3             | 33.3        |
| 5             | 9             |  | 5             | 55.5        | 3             | 33.3        | 0             | 0           |
| <b>TOTALS</b> | <b>68</b>     |  | <b>47</b>     | <b>69.1</b> | <b>30</b>     | <b>44.1</b> | <b>13</b>     | <b>19.1</b> |

## 7. **CONCLUSIONS**

### 7.1. Conclusions

(1) When growing\* on a LoopGrow® frame, whether single plant or two plants, gardeners can anticipate yield per plant to be not less than the recognised normal yield (1,000 g) .

Confidence in this conclusion may be said to increased by the analysis in Table (3) – (percent of values (yields per plant) overall and by set).

(3) When growing\* two plants on a frame a yield of up to 30% higher than recognised normal yield per plant is possible, giving a yield per plant of 1,322 g and per frame of 2,644 g.

(4) Gardeners can anticipate a reduction in yield per plant of 30% when growing two plants on a frame compared to yield when growing one plant on a frame.

(5) When growing two plants on a frame using Tomorite® liquid fertiliser, a yield per plant – at 1,499 g – as high as 50% above recognised normal yield per plant is possible.

(6) Growing companion plants as in the trial is not recommended.

### 7.2. DISCUSSION

#### 7.2.1 Companion plants

Growers reported growth restricted by overshadowing.

It is recognised that dwarf runners generally do best in pots.

(Mean yields of 1,000 g per plant have been reported when grown in pots with Tomorite® See 5.3)

#### 7.2.2. One plant or two plants on a frame

Although the yield is higher **per plant** when plants grown singly 1,926 g, the yield from a **frame** carrying two plants (2,644 g) is greater, and a grower's outlay on frames would be smaller (See Tables of Yields Summary 2).

A pilot census\*\* of number of climbing runner plants grown in allotments suggests that ten plants would be usual for the growers described in 2.1. For this four frames yielding total 11 kg would be needed if two plants per frame.

If using A-frames, eleven canes would be needed for 11 kg total yield.

#### 7.2.3. Design of frame

In the trial the plants were grown all round the loop – that is up. then across, then down – a total growing distance of 2,100 mm (see 5.1). However, it may be assumed that a section growing downwards on one of the verticals will be less productive than the section growing vertically – therefore naturally. Growers found it difficult to train the plants downwards, and further designs will have the plants growing upwards and horizontally only.

Volunteer growers generally commented positively on the structure of the frame – accessibility – also the stability in bad weather. However, a significant number would prefer the frame to be taller.

A frame of similar character has now been designed, which grower can adjust to any height required, and which retains the strength and stability of the original.

This will go out on trial in 2025.

\* Benchmaster seeds in fertile soil

\*\* Details in Attachment (8).

## 8. **ACKNOWLEDGEMENTS**

I wish to thank the following for their advice and encouragement – freely given and so much appreciated :

Berkshire College of Agriculture – Statistical analysis of results (yield figures) and tabulation

Capel Manor College – David Liddle – Lecturer – Information on previous trials.

Sparsholt College – Jamie Cryer, Horticultural Grounds Manager & Lecturer – Advice and review of Report

Barrymore Landscapes, London – Barry Burrows CEO

No-Dig Gardening – Charles Dowding – Review of Report

Growveginteractive – Ben Vanheems – Advice and Review of Report

Ceri Thomas, *Which? Gardening* – Information (previous trials)

Anthony Boyd

July, 2024

# Attachments at a glance

Click on any thumbnail to enlarge

1

Normal Yields

Emails from:

Which? *Gardening*

RHS Gardening  
Advice

2

Letters from:

Dr David Hessayon and Westland and  
Garden Health

3

Conference Paper,  
Lauri 1998:

The Effects of Bending  
on The Growth and  
Fruit Production of  
Inra Fercer® Sweet  
Cherry

Emails from

*Which? Gardening*  
*RHS Gardening Advice*

Conference Paper

4

Guidance on Cultivation

5

Completed Records of Yields

6



Completed Questionnaires

7

Dwarf Bean  
Yields

Dwarf Bean Yields  
Letter to: *Simply Vegetables*,  
06/04/2020.  
RHS Bulletin Number 19,  
October 2007. Page 6

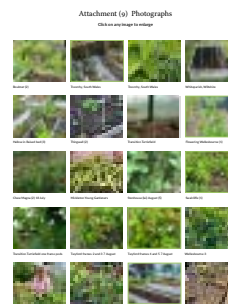
8

Number of values 50  
Mean 19 plants  
Mode 20 plants  
Median 18 plants

Number of values 22  
Mean 10 plants  
Mode 12 plants  
Median 10 plants

Number of Plants per plot

9



Photographs

## Attachment (1) Normal Yields

Email from *Which? Gardening* 15/11/2019.

“Beans produce plentiful crops so to avoid being overwhelmed, the trick is to grow just the right amount of plants for your needs. In the *Which? Gardening* trial, most varieties produced at least 0.5 kg per plant, and our Best Buy runner bean varieties produced up to 1 kg per plant in a season. So a single wigwam of a dozen plants would be plenty for a small household of 2–3 persons.”

2. Email from RHS *Gardening Advice* 4/1/2019.

“The yield of a dwarf runner bean is about 400 g per plant. For climbing runner beans the figure is about 1,000 g per plant. Watering plants well when they are in flower (or failing to water well) will significantly influence yields.”

3. *RHS Vegetable & Fruit Gardening*, 2013, p. 242. 4)

4. RHS Bulletin Number 19, October 2007. Page 10. Average per plant 969.19 g.

## Attachment (2) Horizontal growing

Letter from Dr David Hessayon 23/02/2016:



Attachment (2) Horizontal growing *Cont'd*

Letter from Garden Technical Development Manager, Westland Garden Health 09/02/2017 :



## Attachment (3)

Conference Paper, Lauri 1998:

### THE EFFECTS OF BENDING ON THE GROWTH AND FRUIT PRODUCTION OF INRA FERCER® SWEET CHERRY

January 1998

DOI:10.13140/2.1.4657.2805

Conference: Proc. Third Int. Cherry Sym. 411 Ed. Jonas Ystaas Acta Hon. 468, ISHS 1998

Authors: Lauri, Pierre-Eric

French National Institute for Agriculture, Food, and Environment (INRAE)

Also

Emails exchanged re curbing apical dominance trials:

March 2024 David Riddel, Capel Manor College, Ceri Thomas, *Which? Gardening*.

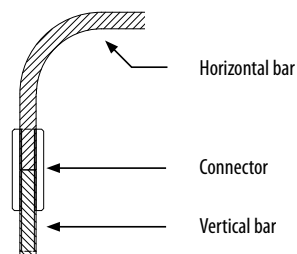
## Attachment (4) (Guidance on cultivation)

### Loop frame for climbing beans – open ground and raised beds

#### Assembly and Cultivation

##### Assembly

**Step 1** Join the three bars where indicated to form a loop using the connectors.

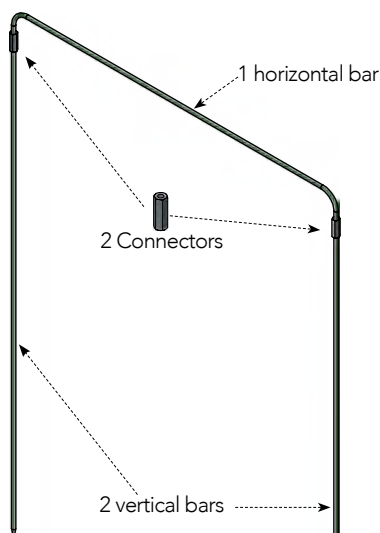


**Step 2** Press frame down into soil with frame height 70cm from ground.

**Storage** Move into a dry store over winter. Protect threaded ends of bars with copper grease.

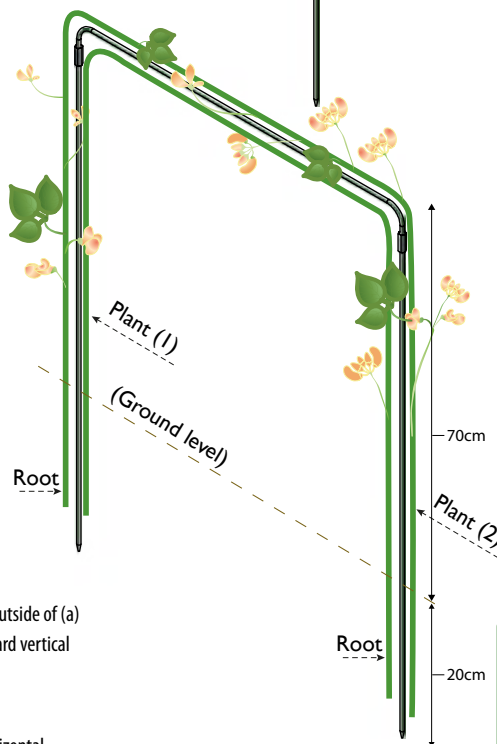
##### Cultivation

1. Take your strongest seedling and plant into soil adjacent to the inside of one "leg" (vertical bar) of the loop – See diagram. Keep other seedlings in reserve in case of failure.
2. Put down slug pellets (ferric oxide or organic).
3. As plant stem grows, tie lightly at 6cm intervals to the inside of the "leg" of the loop, then over the curve at the top of the horizontal. Carry on tying along the inside of the horizontal, then down to ground level and trim ends (See diagram).
4. When growing two plants on the frame, plant the second seedling beside the base of the second (opposing) vertical bar ("leg"). Tie the stem along the outside of (a) the "leg", (b) the horizontal section and (c) the downward vertical bar (See diagram).
5. Water plants regularly to keep soil moist.
6. Allow stems and foliage to grow to 30cm above the horizontal section of the looped bar, then trim level.
7. Inspect regularly for dead foliage and trim off.
8. Pick pods once reach length 20cm.



##### Schedule

- 1 horizontal bar
  - 2 vertical bars
  - 2 connectors
  - 1 bag of seeds
- Grower to provide twine or similar (See 3 below)



**Storage** Move into a dry store over winter protecting threaded ends of bars with copper grease.



Attachment (5) Completed records of yield

Grower: Lori Ann Russell 21/9/23  
 Organisation: Stenhouse Alderment

**Record of Yields Group (1) Page 1**

| Date | Frame(1) - One plant          |               | Frame(2) - Two plants         |               | Frame(3) - Three plants       |               | Frame(4) - Three plants       |               | Frame(5) - Three plants       |               |
|------|-------------------------------|---------------|-------------------------------|---------------|-------------------------------|---------------|-------------------------------|---------------|-------------------------------|---------------|
|      | Benchmark<br>Pods<br>(Number) | Weight<br>(g) | Benchmark<br>Pods<br>(Number) | Weight<br>(g) | Benchmark<br>Pods<br>(Number) | Weight<br>(g) | Benchmark<br>Pods<br>(Number) | Weight<br>(g) | Benchmark<br>Pods<br>(Number) | Weight<br>(g) |
| 9.7  |                               |               |                               |               |                               |               | 4                             | 74            | 3                             | 84            |
| 11.7 |                               |               |                               |               |                               |               | 7                             | 257           | 4                             | 88            |
| 13.7 |                               |               |                               |               |                               |               | 1                             | 34            |                               |               |
| 17.7 |                               |               |                               |               |                               |               |                               |               | 5                             | 80            |
| 18.7 |                               |               |                               | 3             | 118                           |               | 5                             | 149           | 4                             | 76            |
| 20.7 |                               |               | 4                             | 107           | 3                             | 75            | 3                             | 48            | 5                             | 97            |
| 21.7 |                               |               |                               |               | 2                             | 63            |                               |               | 4                             | 39            |
| 22.7 |                               |               | 3                             | 57            |                               |               |                               |               | 3                             | 46            |
| 23.7 |                               |               | 5                             | 91            | 4                             | 72            | 5                             | 88            |                               |               |
| 24.7 | 2                             | 57            |                               |               |                               |               |                               |               | 3                             | 59            |
| 25.7 |                               |               | 3                             | 69            |                               |               | 4                             | 87            | 6                             | 142           |
| 27.7 |                               |               | 5                             | 118           | 4                             | 76            | 5                             | 106           |                               |               |
| 29.7 | 10                            | 195           | 3                             | 68            | 3                             | 56            | 6                             | 116           | 1                             | 20            |
| 30.7 |                               |               | 2                             | 41            | 2                             | 28            |                               |               | 3                             | 49            |
| 1.6  | 6                             | 183           | 4                             | 48            | 2                             | 49            | 3                             | 45            | 3                             | 65            |

Attachment (5) Completed records of yield *Cont'd*

22/9/23

Grower LAR FUL RUSSELL  
 Organisation Stanhause Attainment

**Record of Yields**

Sheet (3)  
Group (1)

| Date | Frame(1) - One plant |               |            |               | Frame(2) - Two plants |               |            |               | Frame(3) - Three plants |               |            |               |            |
|------|----------------------|---------------|------------|---------------|-----------------------|---------------|------------|---------------|-------------------------|---------------|------------|---------------|------------|
|      | Benchmark            | Pods (Number) | Weight (g) | Pods (Number) | Benchmark             | Pods (Number) | Weight (g) | Pods (Number) | Benchmark               | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) |
| 10.9 | -                    | -             | -          | 14            | 347                   | 9             | 98         | -             | -                       | -             | -          | 4             | 113        |
| 11.9 | -                    | -             | -          | -             | -                     | 5             | 134        | -             | -                       | -             | -          | -             | -          |
| 14.9 | -                    | -             | -          | 2             | 40                    | -             | -          | 13            | 267                     | -             | -          | 1             | 34         |
| 20.9 | -                    | -             | -          | -             | -                     | 4             | 34         | 5             | 61                      | -             | -          | 4             | 51         |

Attachment (5) Completed records of yield *Cont'd*

Grower hai fun Russell 22/9/23  
 Organisation Stenhove Advent

**Record of Yields Group (1) Page 2**

| Date | Frame(1)- One plant |            | Frame(2)- Two plants |            | Frame(3)- Three plants |            | Frame(4)- Three plants |            | Frame(5)- Three plants |            |
|------|---------------------|------------|----------------------|------------|------------------------|------------|------------------------|------------|------------------------|------------|
|      | Pods (Number)       | Weight (g) | Pods (Number)        | Weight (g) | Pods (Number)          | Weight (g) | Pods (Number)          | Weight (g) | Pods (Number)          | Weight (g) |
| 3-8  | 2                   | 42         | 5                    | 69         | 6                      | 161        | 3                      | 46         | 3                      | 46         |
| 6-8  | 1                   | 11         | 10                   | 169        | 10                     | 191        | 4                      | 99         | 7                      | 119        |
| 10-8 | 9                   | 167        | 14                   | 347        | 15                     | 303        | 12                     | 277        | 1                      | 16         |
| 13-8 | 13                  | 236        | 16                   | 283        | 22                     | 405        | 12                     | 359        | 11                     | 180        |
| 14-8 | 5                   | 61         | 5                    | 86         |                        |            | 3                      | 34         | 4                      | 85         |
| 17-8 | 11                  | 231        | 7                    | 121        | 25                     | 546        | 3                      | 70         | 9                      | 194        |
| 19-8 | 11                  | 220        | 6                    | 125        | 3                      | 55         | 5                      | 59         | 6                      | 99         |
| 22-8 | 5                   | 107        | 11                   | 244        | 13                     | 269        | 8                      | 166        | 14                     | 275        |
| 24-8 | 4                   | 55         | 15                   | 231        | 9                      | 155        | 4                      | 61         | 7                      | 150        |
| 25-8 | 4                   | 52         | 11                   | 193        | 1                      | 10         | 7                      | 94         | 6                      | 84         |
| 26-8 |                     |            | 13                   | 185        | 13                     | 174        | 5                      | 62         | 8                      | 100        |
| 27-8 | 4                   | 50         | 3                    | 46         | 4                      | 102        | -                      | -          | 8                      | 141        |
| 30-8 | 9                   | 132        | -                    | -          | -                      | -          | -                      | -          | 4                      | 50         |
| 31-8 | 9                   | 121        | 7                    | 150        | 9                      | 177        | 10                     | 196        | 14                     | 291        |
| 6-9  | 10                  | 350        | 7                    | 12         | 14                     | 441        | 12                     | 323        | 7                      | 186        |

Attachment (5) Completed records of yield Cont'd

Grower Hai Fun Russell 22/9/23  
 Organisation Stenhavre Advent

**Record of Yields Group (1) Page 2**

| Date | Frame(1)- One plant        |            | Frame(2)- Two plants       |            | Frame(3)- Three plants     |            | Frame(4)- Three plants     |            | Frame(5)- Three plants     |            |
|------|----------------------------|------------|----------------------------|------------|----------------------------|------------|----------------------------|------------|----------------------------|------------|
|      | Benchmark<br>Pods (Number) | Weight (g) | Benchmark<br>Pods (Number) | Weight (g) | Benchmark<br>Pods (Number) | Weight (g) | Benchmark<br>Pods (Number) | Weight (g) | Benchmark<br>Pods (Number) | Weight (g) |
| 3-8  | 2                          | 42         | 5                          | 69         | 6                          | 161        | 3                          | 46         | 3                          | 46         |
| 6-8  | 1                          | 11         | 10                         | 169        | 10                         | 191        | 4                          | 99         | 7                          | 119        |
| 10-8 | 9                          | 167        | 14                         | 347        | 15                         | 303        | 12                         | 277        | 1                          | 16         |
| 13-8 | 13                         | 236        | 16                         | 283        | 22                         | 405        | 12                         | 359        | 11                         | 180        |
| 14-8 | 5                          | 61         | 5                          | 86         |                            |            | 3                          | 34         | 4                          | 85         |
| 17-8 | 11                         | 231        | 7                          | 121        | 25                         | 546        | 3                          | 70         | 9                          | 194        |
| 19-8 | 11                         | 220        | 6                          | 125        | 3                          | 55         | 5                          | 59         | 6                          | 99         |
| 22-8 | 5                          | 107        | 11                         | 244        | 13                         | 289        | 8                          | 166        | 14                         | 275        |
| 24-8 | 4                          | 55         | 15                         | 231        | 9                          | 155        | 4                          | 61         | 7                          | 150        |
| 25-8 | 4                          | 52         | 11                         | 193        | 1                          | 10         | 7                          | 94         | 6                          | 84         |
| 26-8 |                            |            | 13                         | 185        | 13                         | 174        | 5                          | 62         | 8                          | 100        |
| 27-8 | 4                          | 50         | 3                          | 46         | 4                          | 102        |                            |            | 8                          | 141        |
| 30-8 | 9                          | 132        |                            |            |                            |            |                            |            | 4                          | 50         |
| 31-8 | 9                          | 121        | 7                          | 150        | 9                          | 177        | 10                         | 196        | 14                         | 291        |
| 6-9  | 10                         | 350        | 7                          | 12         | 14                         | 441        | 12                         | 323        | 7                          | 186        |

Attachment (1) Beans Trial 2023 *Cont'd*

VITAMON NUSUN 3034 TU WJ10M177  
 Grower: E. SKEFFINGTON  
 Organisation: DUFFIELD RD, CAMBRIDGE

### Record of Yields Group (1)

| Date | Benchmaster   |            | Benchmaster   |            | Benchmaster   |            | Benchmaster   |            | Benchmaster   |            | Benchmaster   |            | Benchmaster   |            |
|------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|
|      | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) | Pods (Number) | Weight (g) |
| 1/4  | 11            | 55         | 1             | 3          | 10            | 40         | 2             | 6          | 5             | 25         | 0             | 0          | 0             | 0          |
| 17/7 | 6             | 20         | 2             | 25         | 10            | 40         | 0             | 0          | 0             | 0          | 0             | 0          | 0             | 0          |
| 22/7 | 0             | 0          | 3             | 15         | 10            | 50         | 10            | 25         | 6             | 10         | 0             | 0          | 0             | 0          |
| 24/7 | 6             | 25         | 0             | 0          | 6             | 25         | 3             | 15         | 6             | 25         | 5             | 10         | 1             | 5          |
| 26/7 | 6             | 20         | 1             | 5          | 2             | 10         | 0             | 0          | 1             | 5          | 0             | 0          | 4             | 10         |
| 29/7 | 32            | 105        | 28            | 110        | 30            | 105        | 9             | 25         | 3             | 35         | 4             | 10         | 6             | 25         |
| 5/8  | 9             | 40         | 7             | 40         | 7             | 35         | 1             | 1          | 8             | 40         | 0             | 0          | 6             | 25         |
| 12/8 |               | 140        |               | 70         |               | 40         |               | 10         |               | 50         |               | 10         |               | 45         |
| 14/8 |               | 170        |               | 50         |               | 25         |               | 0          |               | 100        |               | 15         |               | 0          |
| 26/8 | 15            | 75         | 9             | 50         | 10            | 50         | 9             | 15         | 13            | 80         | 3             | 5          | 16            | 45         |
| 31/8 | 62            | 350        | 65            | 380        | 78            | 405        | 43            | 120        | 35            | 220        | 31            | 55         | 60            | 300        |
| 31/8 | 104           | 535        | 94            | 530        | 58            | 285        | 82            | 200        | 40            | 210        | 34            | 70         | 51            | 245        |
| 3/9  | 56            | 280        | 50            | 295        | 30            | 110        | 2             | 0          | 12            | 405        | 32            | 80         | 28            | 150        |
| 10/9 | 48            | 220        | 16            | 75         | 10            | 55         | 0             | 0          | 9             | 90         | 0             | 0          | 11            | 80         |
| 15/9 | 12            | 90         | 10            | 60         | 9             | 55         | 4             | 10         | 9             | 60         | 6             | 0          | 15            | 125        |

4400

## Attachment (6) Completed Questionnaires

QUESTIONNAIRE FOR: Growers using open ground/raised beds model and model to go on hard surfaces

**1. INSTRUCTIONS ON ASSEMBLING FRAME**

Hard? Yes/no

Could be better? Yes/no

If Yes, how? It might be hard for someone with dexterity issues as threading the bits together was a little fiddly.

Other observations (if any) on instructions for assembly Since re-read your instructions which say factory made ones would be solid.

**2. INSTRUCTIONS ON CULTIVATION OF PLANTS**

Complete? Yes/no

Clear? Yes/no

Could be better? Yes/no

If Yes, how?

Other observations (if any) on instructions for cultivation

Attachment (6) Completed questionnaires *Cont'd*

3. BEAN VARIETIES GROWN

Variety: Firestorm? - hopefully you have a record of the variety sent.

Quality of crop?  Good  poor

Other observations

4. GROWING SYSTEM

CONSTRUCTION OF FRAMES (Height, depth in soil, length) pushed 10-20cm into soil

Improvements needed:  Yes  no?

If yes, which and why?

CONNECTING STEMS TO BARS - PREFERENCE

Using loops of twine or similar  Yes  no?

Winding stem round bar  Yes  no?

Reason(s)? I started winding the stems around the bars but stopped once I realised you wanted them tied on. The stems seem to naturally wind around anyway.

OTHER OBSERVATIONS (IF ANY) ON GROWING SYSTEM

2 plants per frame become very congested and it is difficult to determine the end of the plant to chop. 1 plant is much easier to maintain.

5. HOW (DO YOU THINK) THIS GROWING SYSTEM IS LIKELY

Attachment (6) Completed questionnaires *Cont'd*

**TO BE PERCEIVED (COMPARED TO TRADITIONAL SYSTEMS)**  
**BY THE FOLLOWING :**

Gardeners – personal                      Useful:  Yes/no  
Reasons for people with mobility issues  
it is very good.

Community Garden Managers              Useful:  Yes/no  
Reasons AS above

Teachers                                      Useful:  Yes/no  
Reasons AS above

Therapists                                      Useful:  Yes/no  
Reasons  
AS above

NAME: LIZ ROUSE  
ORGANISATION ALTON ALLOTMENT  
DATE 10/10/2023

Attachment (6) Completed questionnaires *Cont'd*

QUESTIONNAIRE FOR:

Growers using open ground/raised beds model and model to go on hard surfaces

**Sue Cummins**

**1. INSTRUCTIONS ON ASSEMBLING FRAME**

Hard? /no

Could be better? Yes/

If Yes, how?

I had the version which was made up of construction bars

Other observations (if any) on instructions for assembly

**2. INSTRUCTIONS ON CULTIVATION OF PLANTS**

Complete? Yes

Clear? Yes

Could be better? no

If Yes, how?

Other observations (if any) on instructions for cultivation?

Due to a holiday I was not able to grow the runners as early as I had wanted, never the less the germination was good.

**3. BEAN VARIETIES GROWN**

Variety: Benchmaster

Quality of crop? Good

Other observations

Lovely bean, I grew the remainder in my traditional way, and to a longer length, had a bumper crop and was harvesting well in October. Was impressed with how stringless they were.

Will grow them again

**4. GROWING SYSTEM**

CONSTRUCTION OF FRAMES (Height, depth in soil, length)

See photo, in raised bed, soil mixed compost with top dressing of mulch, frame went a long way into soil

Improvements needed Yes

If yes, which and why?

Proper frames

CONNECTING STEMS TO BARS – PREFERENCE

Attachment (6) Completed questionnaires *Cont'd*

Using loops of twine or similar Yes started off like this but as plants grew this was not feasible

Winding stem round bar Yes

Reason(s)?

OTHER OBSERVATIONS (IF ANY) ON GROWING SYSTEM

The plants on the frame matured far more quickly than my traditional method ( two weeks plus) and continued to crop through to October.

5. HOW (DO YOU THINK) THIS GROWING SYSTEM IS LIKELY TO BE PERCEIVED (COMPARED TO TRADITIONAL SYSTEMS) BY THE FOLLOWING :

Gardeners – personal Useful: Yes

Reasons I was surprised how early flowers appeared and cropping occurred. I would like to have grown more than a single plant.

Community Garden Managers Useful: Yes/no

Reasons

Teachers Useful: Yes/no

Reasons

Therapists Useful: Yes/no

Reasons

NAME: Sue Cummins

ORGANISATION Personal

DATE 20th November 2023

## Attachment (7) (Dwarf bean yields)

Letter to Editor, *Simply Vegetables*, 06/04/2020.

RHS Bulletin Number 19, October 2007. Page 6.

## Attachment (8) (Number of Plants per Plot)

Note of Pilot Census of number of climbing runner beans grown allotments.

A census of number of runner bean plants grown on allotments taken in at the same time as the recording of yields in the trial gave the following :

|                         |                  |
|-------------------------|------------------|
| <b>Number of values</b> | <b>50</b>        |
| <b>Mean</b>             | <b>19 plants</b> |
| <b>Mode</b>             | <b>20 plants</b> |
| <b>Median</b>           | <b>18 plants</b> |

If we assume that the number of plants grown by those for whom the frame is designed (See 2.2.1) fall into the lower half of the values (below 18 plants), the results for them only are:

|                         |                  |
|-------------------------|------------------|
| <b>Number of values</b> | <b>22</b>        |
| <b>Mean</b>             | <b>10 plants</b> |
| <b>Mode</b>             | <b>12 plants</b> |
| <b>Median</b>           | <b>10 plants</b> |

The normal expectation of yield being 1.0 kg per plant (See 2.1) and thus 10.0 kg for ten plants, four frames would be needed for this yielding a total of 10.6 kg (see 7.2.3.), if two plants grown on a frame.

If a single plant per frame, yielding 2.0 kg then five frames would be needed.  
(See 6.1.2(a))

# Attachment (9) Photographs

Click on any image to enlarge

Akenham, Suffolk

Boulmer, Northumberland

Chew Magna, Somerset

Hallow, Worcestershire (1)

Hallow, Worcestershire (2)

Stenhouse, Edinburgh

Swalcliffe, Oxfordshire

Thingwall, Wirral

Treorchy, South Wales (1)

Treorchy, South Wales (2)

Turriefield, Shetland (1)

Turriefield, Shetland (2)

Twyford, Berkshire (1)

Twyford, Berkshire (2)

Wellesbourne, Warwickshire(1)

Wellesbourne, Warwickshire (2)

Wellesbourne, Warwickshire (3)

Whiteparish, Wiltshire (1)

Whiteparish, Wiltshire (2)

Whiteparish, Wiltshire (3)



Akenham, Suffolk



Boulmer, Northumberland



Chew Magna, Somerset



Hallow, Worcestershire (1)



Hallow, Worcestershire (2)



Stenhouse, Edinburgh



Swalcliffe, Oxfordshire



Thingwall, Wirral



Treorchy, South Wales (1)



Treorchy, South Wales (2)



Turriefield, Shetland (1)



Turrieffield, Shetland (2)



Twyford, Berkshire (1)



Twyford, Berkshire (2)



Wellesbourne, Warwickshire (1)



Wellesbourne, Warwickshire (2)



Wellesbourne, Warwickshire (3)



Whiteparish, Wiltshire (1)



Whiteparish, Wiltshire (2)



Whiteparish, Wiltshire (3)