



Bean YEN Entry Protocol

Welcome to the Bean Yield Enhancement Network (YEN) 2020

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IMMEDIATE ACTIONS

- ☐ Collect and return your soil sample
- ☐ Complete and return application form

PRE-HARVEST ACTIONS

- ☐ Complete 1 m² plant counts/ take overhead crop photo at GS10
- ☐ Complete and return entry pack throughout season
- ☐ Record date of crop growth stages
- ☐ Collect and send tissue samples at GS34 and GS65
- ☐ Collect and send grab sample just before harvest

POST-HARVEST ACTIONS

- ☐ Collect and return grain sample at harvest
- ☐ Make sure the Entry Pack essential for full entry information (blue), and extra network benchmarking information is returned
- ☐ Return Yield Entry Form

DO-IT dates

APRIL	Return Soil Samples and GS 10 overhead photos
APRIL/MAY	Return tissue sample GS34
MAY/JUNE	Return tissue sample GS65
SEPTEMBER	Return Grab and Grain samples
SEPTEMBER	Return Yield Entry Form

... and the final date

30 APRIL
30 MAY
30 JUNE
30 SEPTEMBER
15 OCTOBER

GENERAL INFORMATION

Welcome to Bean YEN 2020, the second year of Bean YEN. We're excited to be broadening out the Bean YEN this season to include more growers. There may be some optional extras available throughout the season which become available (any updates will be emailed to entrants), and currently includes:

SOIL SAMPLING KIT

As part of the YEN, NRM provide free soil assessments for YEN entries up until the end of April. Soil samples after April are still encouraged but will need to be paid for. Once you have registered and confirmed the postal address, a soil sampling kit will be sent to you. Top Tips for sampling soils for YEN are given below; all images in this section are courtesy of NRM.



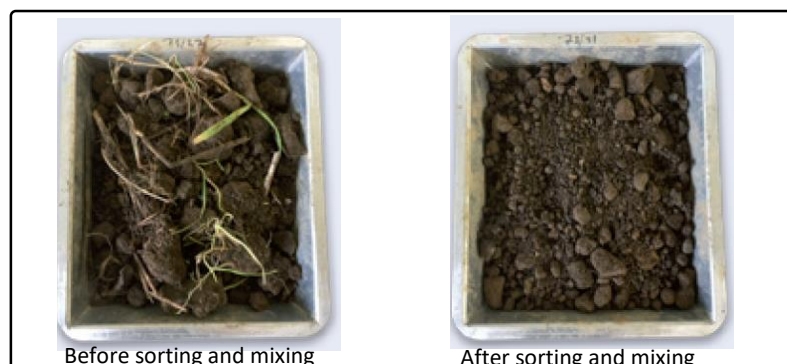
Top Tips for sampling soils for the YEN

Where & how to sample

- Make sure you have a suitable soil corer or auger for your sampling depth. The sampling depth can be 0 - 15 cm or 0 - 23 cm if the land has been ploughed in the last few years, but should be 0 - 23 cm if min-till or no-till cultivations have been used recently.
- To avoid cross contamination, clean your soil auger and bucket between sampling areas.
- The sample should be taken to represent the whole YEN-entered area. Take 20-25 cores from sampling points forming a 'W or M' pattern across the area.
- Avoid taking samples from headlands, or in the surrounding areas which will not be included in the YEN-entered area (please refer to diagram below).

Preparing & labelling your sample

- Remove all roots, plant material or accumulated surface organic matter in the sample and mix together the sub-samples from all 20-25 positions in a clean container to form a representative sample. See images before and after sample preparation below.



- Place approximately 300g in the packaging provided by NRM (either box or medium grip-seal bag filled to top of middle line)
- Clearly label and seal each sample with your YEN entry number (e.g. PF00XXX) and field name (e.g. Big Field)
- Paperwork (provided by NRM) must accompany the samples.

Visual Evaluation of Soil Structure (VESS)

The visual evaluation of soil structure is a quick assesment of soil structure. This test is a desired optional extra. If you have the time and are interested, please follow the links below and complete the assessment.

The SRUC webpage for information on VESS ad links to methods and videos click [here](#)

To download the pdf of the VESS score chart click [here](#)

BEAN YEN APPLICATION FORM

Please complete the application form (in excel form format), which includes the following:

- Grower and agronomist name (if applicable) and contact details.
- Farm address & postcode, grid ref / location of field, field name, previous cropping, pea type and variety name.
- If you are not sending off a soil sample to NRM please provide results from a soil sample test from the field from the past 3 years, including date & lab used.
- Confirm method of weighing Beans from harvested area – public or farm weighbridge (preferred option), sold weight, or combine yield monitor (which should be calibrated).

Return information to Beanyen@adas.co.uk as soon as completed

BEAN YEN ENTRANTS PACK

The Bean YEN Entry Pack will be sent out to entrants after we have received an application form. These are in excel forms and contain a number of sections including, the information from the application form, crop observations and actions and crop agronomy. The entrant packs should be updated over the course of the season by entrants and returned to Beanyen@adas.co.uk. Some of the information fields in the entrant packs are essential for a completed entry as they allow YEN to calculate potential yields or other data characteristics. These information fields are highlighted in blue within the entry pack and include:

- Topsoil texture
- Subsoil texture
- Depth to underlying rock
- If the depth to underlying rock is less than 1m, then the type of underlying rock
- The entered field location (grid reference/ IACs number/...)
- Plant population count/ photo

Other information fields allow the YEN to benchmark agronomy practices and produce a more complete report for individuals and strengthens the data set of the whole network. We build on the feedback from the previous year's YEN year to improve which benchmarking information is requested.

Contact details should be kept up to date to ensure you receive information and sampling packs throughout the season.

Site Visits and Crop Observations

This information allows us to understand how a pea crop develops in different situations, helping us understand constraints to yield. All the information you collect can be returned via the entry pack system and site visit dates are listed below (numbered 1 to 6). As well as the actions listed under 1-6, please also use the entry pack system to record any observations at each site visit including:

- Growth stage (See Appendix 1)
- Score overall appearance of crop:
- Score weeds, pests (birds and insects), diseases and viruses:

- Control strategy, if applicable

The PGRO Pea and Bean Guide App

PGRO have developed a free agronomy app, which will be useful in the field. It can aid with pest and disease recognition and is capable of recording and submitting reports of pests and diseases. There is also a built in growth stage guide. The app is available for both Android and Apple devices.

1. Full emergence GS 10 (March /April)

- Record sowing date
- Record the date of full emergence (**GS 10**). If this is missed please record the growth stage on the date you visit.
- Carry out plant counts.
 - In three locations, using a meter stick or quadrat count the number of plants in a 1 m² area. If it's easier, use a 0.25 m² quadrat to count the number of plants and multiply that number by 4 to get the number of plants in 1 square metre. Please record the count in each individual location.
- **Alternatively**, plant counts can be calculated from photographs. Take images at three locations from within the 2ha area entered in the YEN. Take the photo from above the crop looking vertically down, showing as wide an area as possible and including an A4 piece of paper flat on the ground for scale.
 - See examples in Figure 1.
 - Save and name the photo with your YEN field ID number and the month e.g. BF000XXX
 - Send the images as jpeg files to beanyen@adas.co.uk

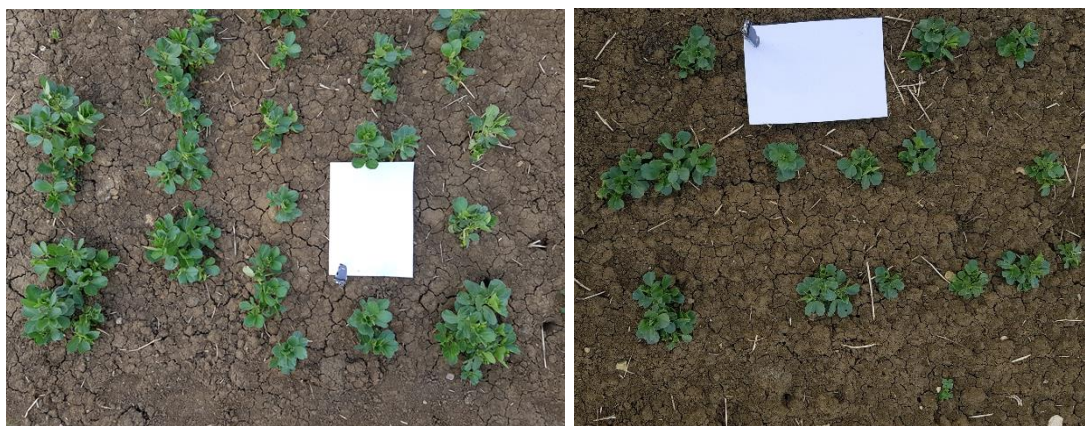


Figure 1. Example photographs for plant population estimate

2. Start of nodulation, Fourth Node (April/May)

- Record date of 4th node - start of nodulation (**GS 34**)
- Collect a representative **leaf tissue sample**, following the method described below.

Leaf Tissue sampling

As part of Bean YEN Lancrop/YARA provide free tissue testing for YEN entrants. Once you have registered you will be sent sampling kits.

At each sampling timing:



- Sample and send Monday to Wednesday to avoid the sample in the post over the weekend.
- Within your YEN area walk up 2 to 4 representative tramlines and sample tissue at regular intervals from between 5 - 20 points along the sampling path.
- At each sampling site select several plants at the same stage of development and sample the youngest mature leaf without the petiole (first fully expanded leaves away from the growing point) until you have between 300g – 400g of material.
- Avoid leaves showing pest, disease or other damage. Take leaves only, not stems.
- Mix the leaves thoroughly, if wet blot the leaves dry with a paper towel and place into a sample bag, squeezing out the excess air and sealing.
- Fill in the order form including crop and growth stage. **Include your email to ensure you get the results.**
- Place the sample bag and the order form into a Lancrop/Yara pre-paid envelope and post. **Do not put the order form inside the bag with the sample as it may get wet.**

3. First florets visible (May/June)

- Record date when the first florets are visible outside the flower bud **(GS 51)**

4. First flower and full flower (May/June)

- Record date of 1st flower seen sporadically within the crop **(GS 60)**.
- Record date of full flower, first 1 inch pod not on the headland **(GS 65)**
- Collect a representative **leaf tissue sample**, as outlined above.

5. End of flowering & Senescence (July/ August)

- Record date when crop is out of flower **(GS 69)**.
- Record date of seed senescence **(GS 89)**
- Take a **Grab sample** of 25 plants. The representative sample should be taken from inside the 2 ha area ensuring that all stems and any branches are collected from 5 plants in 5 locations. The plants should be placed into the large sack provided as part of the harvest pack, and posted to ADAS Gleadthorpe with the address sticker provided.

6. Harvest (July/August)

- Record date when crop is first ripe for harvest, full senescence **(GS 97)**.
- Record actual harvest date **(GS 99)**.
- Provide accurate yield information from either
 - a. Whole field of known area with total weights from weighbridge tickets or calibrated combine yield monitor
 - b. A selected area with minimum size of 2ha, marked out and measured, with total weights from weighbridge or calibrated yield monitor
 - c. Area of a yield map (calibrated yield monitor) ensuring data from cuts of full header width only.
- Record harvest losses by counting number of beans in an A4 paper sized area at 5 locations directly behind the combine and 5 locations between the swaths (ie where beans would only be present by shattering before entering combine, not due to losses over the sieves.) Subject to amendment in the harvest pack.
- Retain a combine sample in the bag provided and forward to ADAS Gleadthorpe, Netherfield Lane, Meden Vale, Mansfield, Nottinghamshire, NG20 9PD


Bean YEN HARVEST PACK

Prior to harvest you will receive the Harvest Pack, sent to the address indicated in your Entry Pack.

The Harvest Pack will contain:

1. Further guidance on collecting grab and grain samples.
2. One pre-labelled potato sack per entry, for the grab sample just before harvest.
3. One pre-labelled polythene bag per entry, for the grain sample at harvest.
4. One yield entry form per entry, which should be completed and returned to ADAS as soon as possible. This can either be by post or an electronic version can be emailed to beanyen@adas.co.uk

CONTACTS

Thomas Wilkinson	Thomas.Wilkinson@adas.co.uk	07503570264
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Or email beanyen@adas.co.uk for general enquiries.		 @adasYEN

Further information can be found at www.yen.adas.co.uk



Appendix I

Phenological growth stages and BBCH-identification keys of faba bean (*Vicia faba* L.)

Faba bean Weber and Bleiholder, 1990; Lancashire et al., 1991

Code Description

Principal growth stage 0: Germination

- 00 Dry seed
- 01 Beginning of seed imbibition
- 03 Seed imbibition complete
- 05 Radicle emerged from seed
- 07 Shoot emerged from seed (plumule apparent)
- 08 Shoot growing towards soil surface
- 09 Emergence: shoot emerges through soil surface

Principal growth stage 1: Leaf development¹

- 10 Pair of scale leaves visible (may be eaten or lost)
- 11 First leaf unfolded
- 12 2 leaves unfolded
- 13 3 leaves unfolded
- 1 . Stages continuous till . . .
- 19 9 or more leaves unfolded

Principal growth stage 2: Formation of side shoots

- 20 No side shoots
- 21 Beginning of side shoot development: first side shoot detectable
- 22 2 side shoots detectable
- 23 3 side shoots detectable
- 2 . Stages continuous till . . .
- 29 End of side shoot development: 9 or more side shoots detectable

Principal growth stage 3: Stem elongation

- 30 Beginning of stem elongation
- 31 One visibly extended internode²
- 32 2 visibly extended internodes
- 33 3 visibly extended internodes
- 3 . Stages continuous till . . .
- 39 9 or more visibly extended internodes

¹ Stem elongation may occur earlier than stage 19; in this case continue with the principal stage 3

² First internode extends from the scale leaf node to the first true leaf node

Principal growth stage 5: Inflorescence emergence

- 50 Flower buds present, still enclosed by leaves
- 51 First flower buds visible outside leaves
- 55 First individual flower buds visible outside leaves but still closed
- 59 First petals visible, many individual flower buds, still closed

Principal growth stage 6: Flowering

- 60 First flowers open
- 61 Flowers open on first raceme
- 63 Flowers open 3 racemes per plant
- 65 Full flowering: flowers open on 5 racemes per plant
- 67 Flowering declining
- 69 End of flowering

Principal growth stage 7: Development of fruit

- 70 First pods have reached final length ("flat pod")
- 71 10% of pods have reached final length
- 72 20% of pods have reached final length
- 73 30% of pods have reached final length
- 74 40% of pods have reached final length
- 75 50% of pods have reached final length
- 76 60% of pods have reached final length
- 77 70% of pods have reached final length
- 78 80% of pods have reached final length
- 79 Nearly all pods have reached final length

Principal growth stage 8: Ripening

- 80 Beginning of ripening: seed green, filling pod cavity
- 81 10% of pods ripe, seeds dry and hard
- 82 20% of pods ripe, seeds dry and hard
- 83 30% of pods ripe and dark, seeds dry and hard
- 84 40% of pods ripe and dark, seeds dry and hard
- 85 50% of pods ripe and dark, seeds dry and hard
- 86 60% of pods ripe and dark, seeds dry and hard
- 87 70% of pods ripe and dark, seeds dry and hard
- 88 80% of pods ripe and dark, seeds dry and hard
- 89 Fully ripe: nearly all pods dark, seeds dry and hard

Principal growth stage 9: Senescence

- 93 Stems begin to darken
- 95 50% of stems brown or black
- 97 Plant dead and dry
- 99 Harvested product

Faba Bean

