Winter Linseed Entrant's Report

Harvest 2023

YEN User ID: LN230000

Entrant name: Example

Main contact email:
NA

Sponsor/supporter:

Sponsor/Supporter email:

Field/Site name:

Location: ADAS

Incident energy this season: 36 TJ/ha

Available water: 461 mm

Crop: Linseed

Variety: Atilla

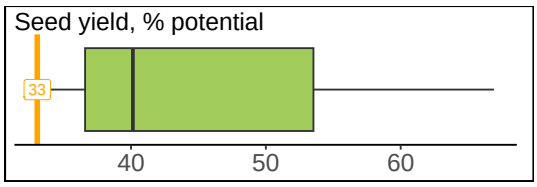
SUMMARY: YEN entries were completed for 8 Winter linseed entrants. Headline results for your entry are shown below. Your yield of 1.9 t/ha ranked 6th. This represents 33% of its estimated yield potential of 6.1 t/ha.

Specific comments on this entry:

- Your soil K was 98.3 mg/l. Levels below 120 mg/l can indicate deficiency.

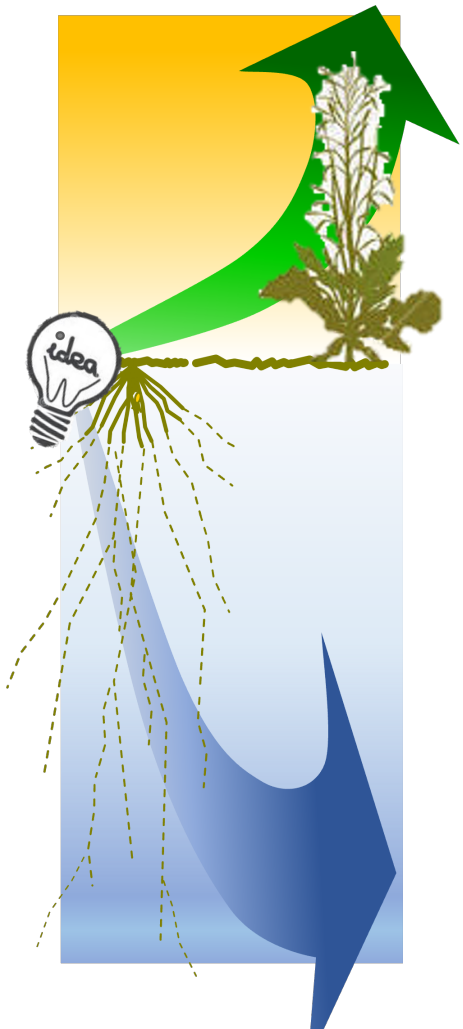
- Your soil P was 16 mg/l. Levels below 17 mg/l can indicate deficiency: check your grain P to see if P was sufficient.

- Your soil is estimated to be pH 7.56 High pH soils may require that special attention is paid to micro-nutrient levels.



Overall yield rank: **6th**

Overall potential yield rank: **3rd**



CONTENTS

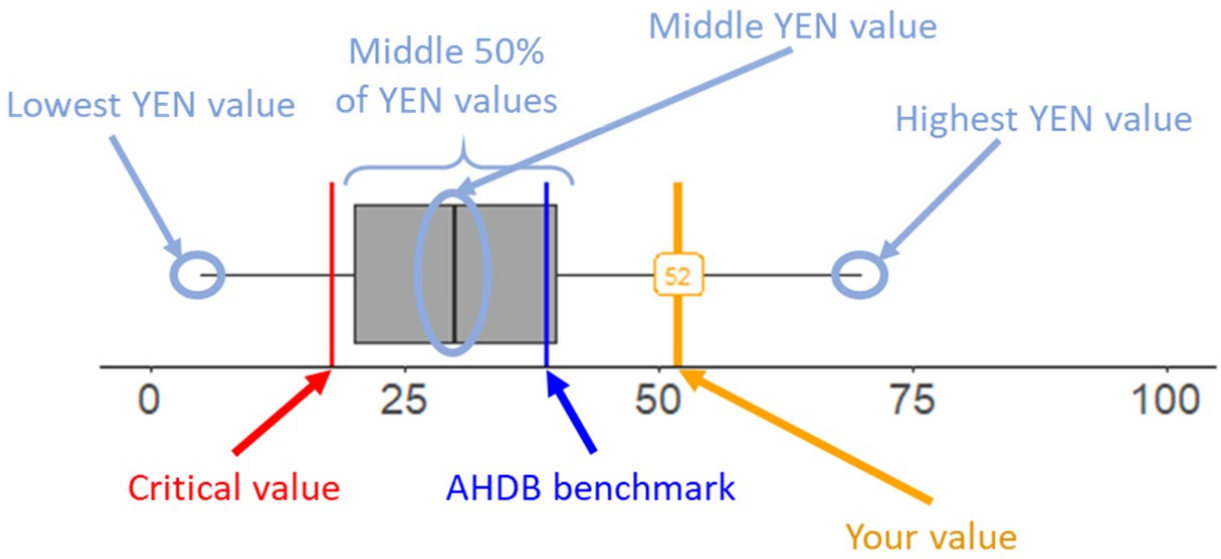
Our detailed analysis of your yield is provided in the following pages. This year we highlighted comparisons between linseed crops only, to help make the information as relevant to linseed yield enhancement as possible. The value and robustness of benchmarking increases with the number of crops in the data set, and whilst the number of linseed entries to the YEN are still growing and it should be noted that the number of data points within each benchmark is limited, we hope that this report demonstrates the potential of linseed benchmarking as engagement continues to grow. The ultimate aim is identifying aspects of your husbandry and growing conditions that offer possible routes to further yield enhancement.

Our approach in this report is to consider yield potentials and growing conditions for crops in this season, then the conditions for and husbandry of your crop, its development, its basic resources (light energy, water and nutrients), its success in capturing these and in converting them to seed yield.

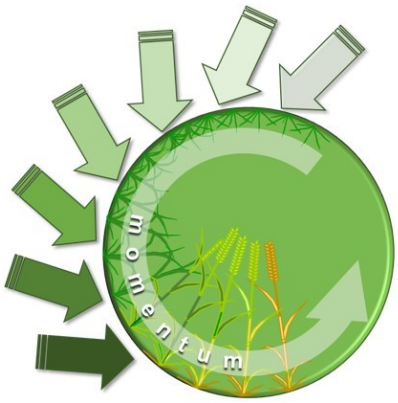
YEN BENCHMARKING CHARTS

What do they mean?

YEN is much more than a competition – it provides a full set of metrics whereby you can gauge the performance of your crop against all other YEN crops. This has proved to provide the prime value of the YEN to its participants. We do this with benchmark-charts. Benchmark-charts compare your value with everyone else's. The key to these charts is as follows:



The 'whiskers' show the range of YEN values in this season and the box shows the middle half of this season's YEN values, with a line for the mid-value. The orange line shows the value for this entry. Currently, there are no established benchmarks or critical values for linseed growth parameters and so the blue and red lines in the example above are not included in the following benchmark-charts. Through continued data collection we hope that the YEN data set will begin to inform some of these values.



"The YEN exists to help you to enhance your yields."

The key to high yields in YEN has been good crop growth. So the key to enhancing yields is to know what is limiting growth – solar radiation or water – and then to target improved green canopies or improved rooting accordingly.

To estimate potential yields we assume a theoretically 'perfect' linseed crop grown with 'inspired' husbandry, on your land with this season's weather, achieving either:

(i) **50% capture of light energy** through the season, and can convert this to plant biomass at 1.4 tonnes / terajoule of solar radiation – or seed biomass at 0.7 tonnes / terajoule of solar radiation.

and

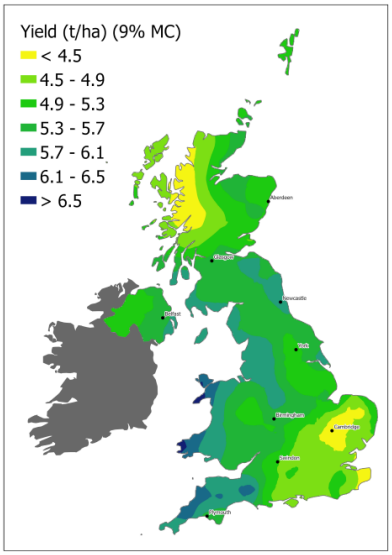
(ii) **Capture 100% of the available water** held in the soil to 1.0 m depth (or less if to rock) plus all rainfall from March to July, and can convert each 18 mm into a tonne of plant biomass per hectare, or 26 mm into a tonne of seed biomass per hectare.

Taking the lesser of these two biomass amounts we assume that a maximum of 45% of the total biomass can be used to form seed (this is the 'harvest index').

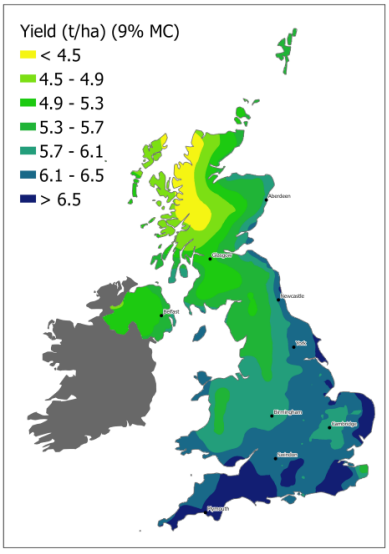
The maps below show potential yields for Autumn and Spring sown linseed on soils with high available water-holding capacity (AWC) for 2023. Potential yields range from 4 to 5 t/ha in the majority of arable regions for spring sown crops and 4.5 to 6 t/ha for winter sown crops.

This year's Potential yields

Spring sown



Autumn sown



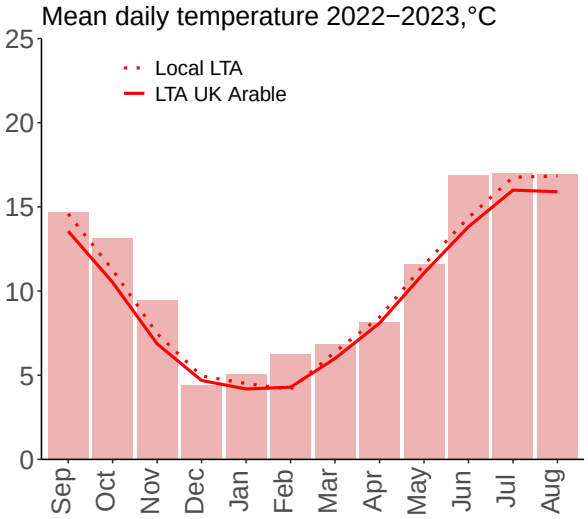
We are using weather data from DTN™ in this year. Note we do not have long term met data from DTN so cannot show a map of long-term average yield potentials.

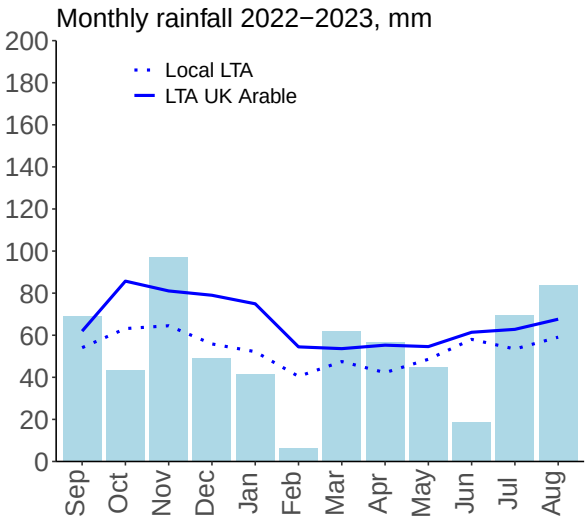
The season's weather

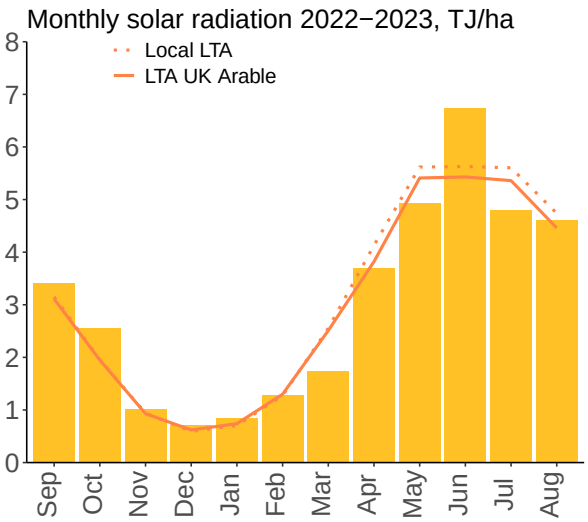
The adjacent graphs show the monthly temperatures, rainfall and solar radiation for your area in 2022-23 compared to your regional long-term average (LTA), and the average for all UK arable areas (1991-2020, from the Met Office). This season, dry drilling conditions led to some crop establishment failures. Some growers reduced N fertiliser rates in response to high N costs.

This season experienced a warmer than average October and March, and a dry winter, all of which have been associated with high yields for oilseed rape, so this may also be positive for winter linseed. However, May was drier than average which has been associated with low yields. Furthermore, June was very dry which is likely to have caused crops on light soils, shallow soils, or with shallow rooting, to have experienced water stress during the critical period when seeds are set and start to fill. On the positive side, June was very sunny which will have helped with seed set and early seed fill for crops with access to sufficient water. July was very wet and there was widespread lodging which will have reduced yields by reducing seed filling and causing pod shatter. July was also dull which will have reduced seed filling for later developing crops and reduced the oil content.

Over the whole season, there have been more negative weather and pest factors than positive factors.







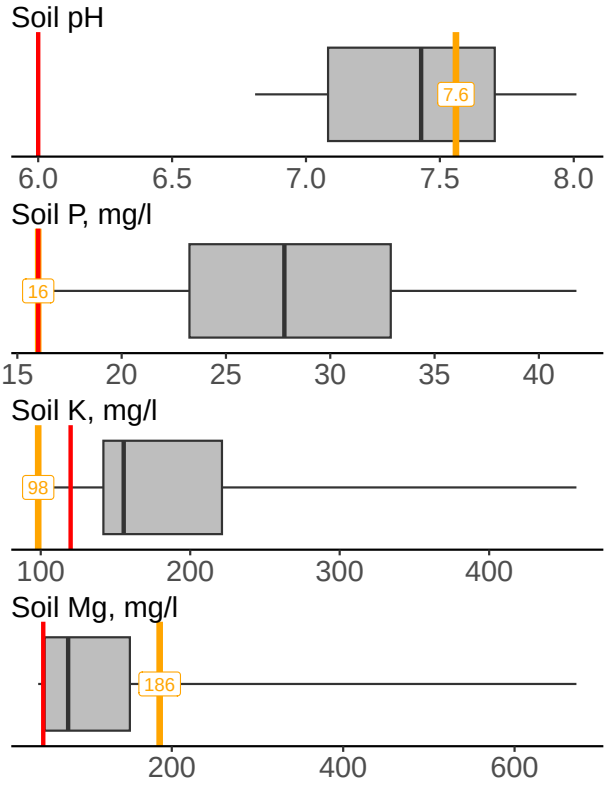
Soil description and nutrition analysis

Your soil's capacity to hold available water is critical in determining your potential yields. We rely on entrants describing the soil where their YEN entry grew. We can use the UK Soil Observatory map viewer to check whether this complies with the surrounding land.

Good soil descriptions are vital in allowing us to estimate soil water holding capacity and, along with summer rainfall, the water available to your crop (see Benchmark charts in the section on 'Resources & their Capture').

Topsoil analyses provided by NRM also tell us about soil status for pH, P, K and Mg, as reported on the next page. A few sites show low values for soil pH, P, K or Mg. If these are unexpected, they may need further checks, either by repeating soil analysis and by checking both leaf and seed analyses later in this report. Previous YEN leaf and seed nutrient data have indicated that UK cereal crops often experience deficiencies in one or more nutrients, and sometimes this is despite soil levels being satisfactory. So, by combined use of soil, leaf and seed analysis, the YENs now help to diagnose whether nutrient shortfalls are arising from poor supply, or poor capture by the root system.

Soil analysis



Soil pH <6 is acid. High pH soils may require that special attention is paid to phosphorus (P) and micro-nutrient levels in leaf and grain (see later).

Only a small difference separates P Index 0 (<=9) and 2 (>=16). High yields are possible at P index 1 but fresh P is also usually required. Use grain P to double-check if P was sufficient.

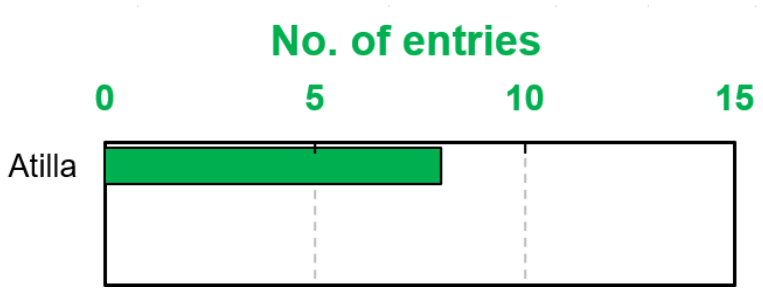
Soil potassium (K) analysis checks on whether K supplies are likely to have been deficient for average crops. However, high yielding crops require very large amounts of K.

Magnesium is a key component of chlorophyll so deficient plants show inter-veinal yellowing. Temporary deficiencies often occur in dry conditions. Levels between 0-25 mg/l indicate a soil index of 0.

The following charts show how the husbandry of your entry related to all other YEN entries this year.

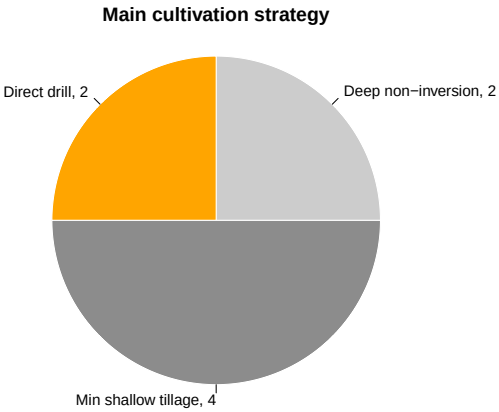
Variety

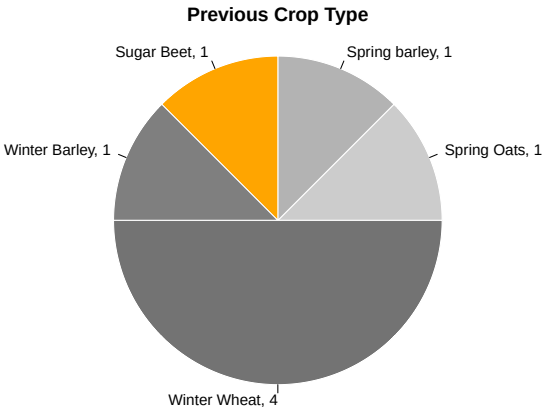
The chart below shows the variety choice amongst YEN entrants in this season.

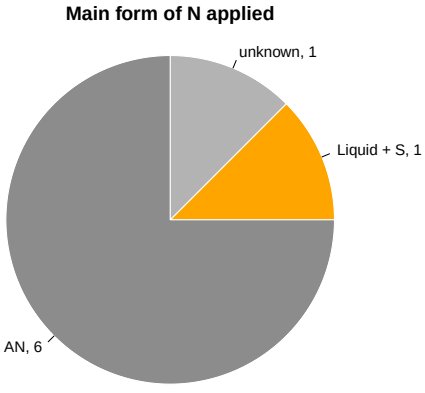


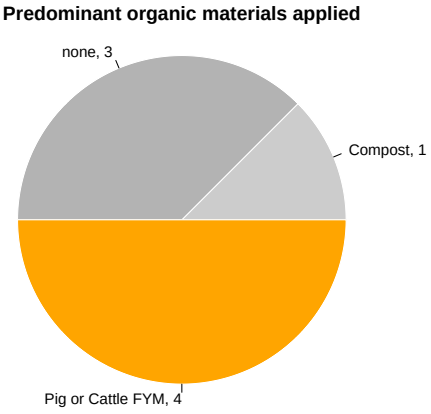
Husbandry

The following diagrams use orange segments or orange bars to indicate the agronomy of your crop, if known, so you can see how this relates to all other YEN entries. The number after the husbandry method is the number of entrants.



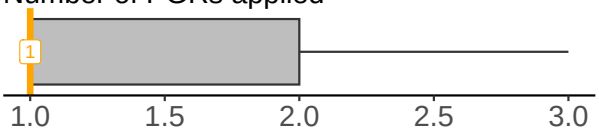




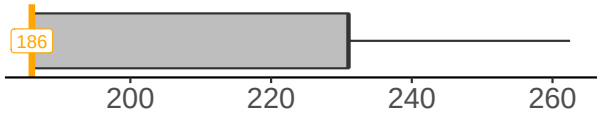


Husbandry factors continued

Number of PGRs applied

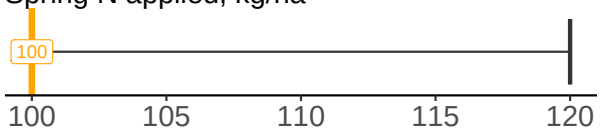


Seeds sown per m^2

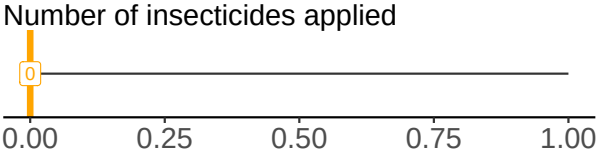


Number of herbicides applied

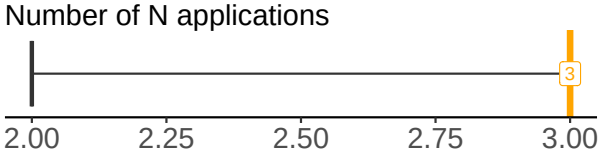
Spring N applied, kg/ha



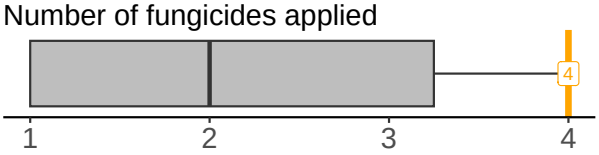
Number of insecticides applied



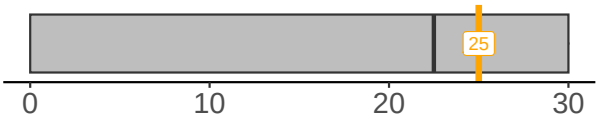
Number of N applications



Number of fungicides applied

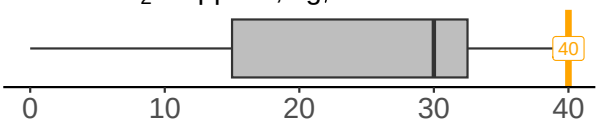


Fertiliser P_2O_5 applied, kg/ha



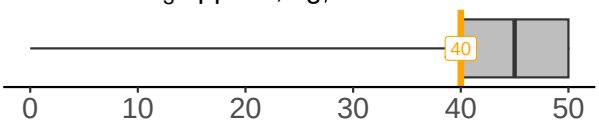
No extra inorganic phosphate was applied to 2023 linseed entries.

Fertiliser K_2O applied, kg/ha



No extra inorganic potash was applied to 2023 linseed entries.

Fertiliser SO_3 applied, kg/ha

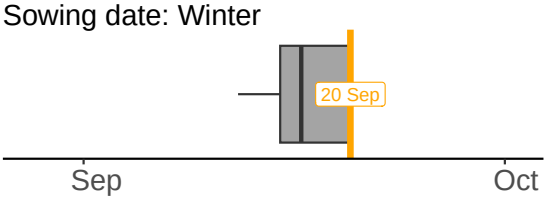


CROP DEVELOPMENT

The following charts show how your entry developed through this season, compared to all other YEN entries. For linseed:

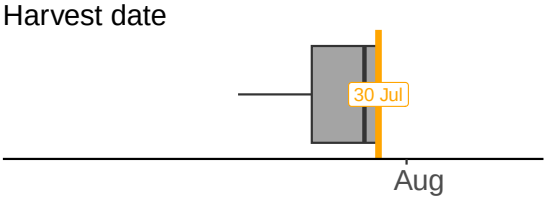
- Foundation, GS3-GS5 – first pair of true leaves to stem extension
- Construction, GS5-GS8 – stem extension to full flower (capsules begin forming)
- Production, GS8-GS12 – full flower to seeds ripe

Sowing date: Winter



Winter varieties are commonly planted mid to late September.

Harvest date

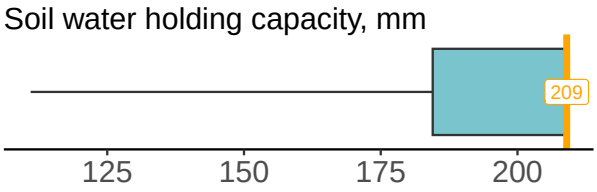


Winter linseed is commonly harvested from mid to late July and Spring linseed is commonly harvested from mid-August to mid-September.

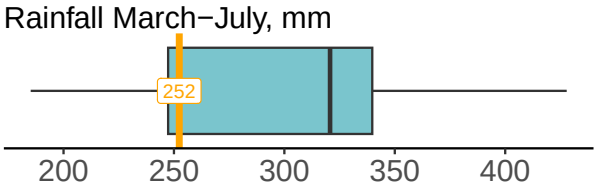
RESOURCES AND THEIR CAPTURE

This page shows how weather this year affected the water available for your crop and other crops entered in the YEN. Water is supplied through the main growing period from concurrent rainfall and also from water stored in the soil. UK soils almost always refill with water over-winter. Water potentially available to each crop through the summer includes all this soil water plus the summer rainfall (March to July).

Water capture

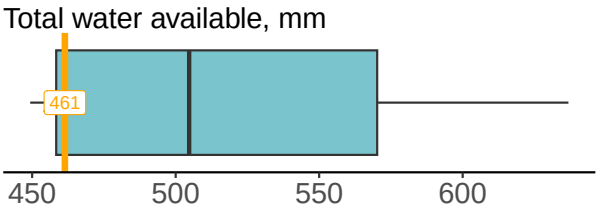


Your soil water holding capacity ranked 1st. A high yielding crop, growing say 7.5 t/ha of biomass (so yielding 3 t/ha dry seed at 40% harvest index), would need to capture just over 150 mm water from soil plus rain in March - July.



After winter drainage stops, spring and summer rainfall is held in the topsoil until it is evaporated or transpired by the crop's canopy.

The soil water holding capacity described above assumes that crops could extract 100% of available water to a soil depth of 1 m (or to rock, if shallower). If sufficient roots didn't reach this depth, soil-available water would be accordingly less.

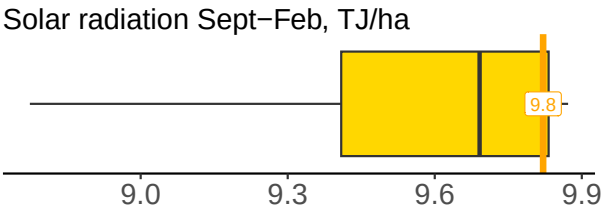


Total water is the sum of your soil's water-holding capacity and your summer rainfall (both shown above). Your total avaialbe water ranked 3rd.

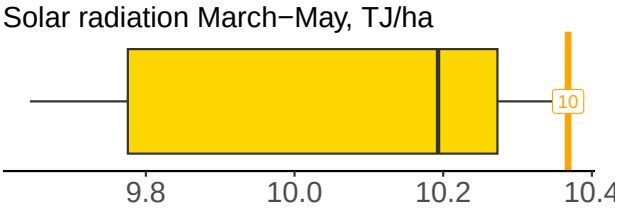
Energy capture

The benchmarking charts below show how weather this year affected light energy available for this entry and other YEN crops. Solar radiation has been divided into periods that roughly equate to the three key phases of crop development reported above:

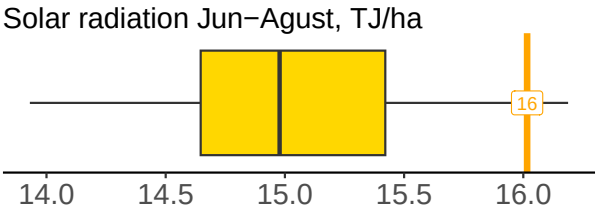
- Foundation – leaf production and formation of main root axes,



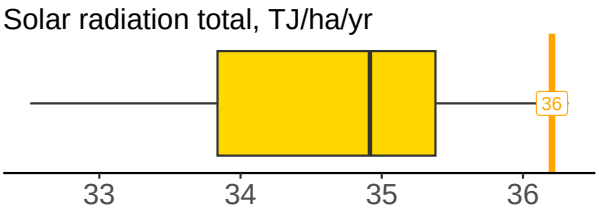
- Construction – stem extension, branching and boll formation,



- Production – when seeds are filled with new assimilates.



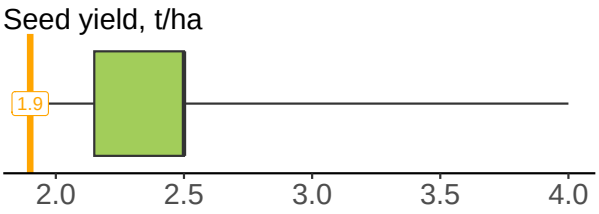
Whilst we cannot yet measure light capture by YEN crops individually, by assuming your crop's conversion of light energy was 'normal' (0.4 t/TJ up to the start of stem extension, 1.1 t/TJ between the start of stem extension and seed filling and 0.4 t/TJ during seed filling), we have made crude estimates below of the likely success of your crop's canopy in capturing light.



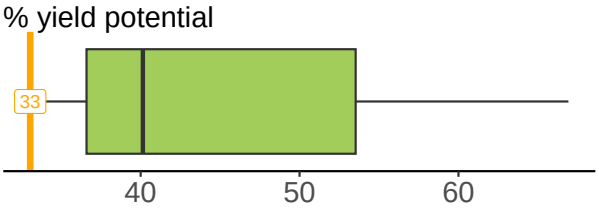
Total solar radiation across YEN entries is generally less in the north and more in the south.

Yield formation

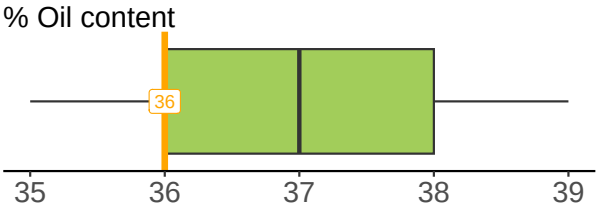
The graphs below show the yield components, and quality parameters for your crop, determined from the samples that you provided. These tell us about the history of your crop because the key yield components are determined sequentially. These 'components of yield' help to indicate the stage(s) through the season at which your crop deviated from the average of other YEN entrants.



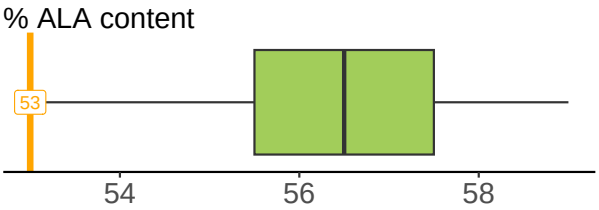
Winter and spring linseed averages around 2.75 t/ha and 2.1 t/ha in the UK.



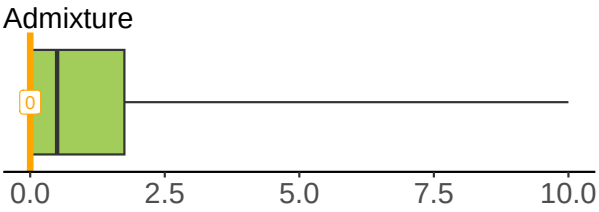
YEN yield potential reflects light energy and water available at your site this year, expressed in t/ha.



Capturing more solar radiation during seed filling will maximise oil yield.



Medium to heavy soils and cooler yet sunny springs are known to boost ALA content.



This includes non-seed plant material, weed material, soil and stones.

YIELD ENHANCEMENT NETWORK RELATED INITIATIVES

FarmPEP

Imagine a library where you can also meet the authors and experts in their respective fields - this is what we want to facilitate in FarmPEP. The FarmPEP site aims to provide easier access to the latest research and best practices as well as a place to connect with others whose knowledge and experience can benefit you. Access the site here. To help learn how we can enable YEN members to engage effectively with FarmPEP, please answer this brief 5 question survey.

YEN Zero

YEN Zero is a community for like-minded growers and industry stakeholders to share their knowledge, practices and test ideas for reducing greenhouse gas (GHG) emissions from crop production. If you're a grower wanting to join the network and receive detailed results and benchmark report of the GHG emissions from 6 of your fields, then please fill out the webform on the YEN Zero webpage and we will contact you.

YEN Nutrition

YEN Nutrition provides multi-field, multi-crop grain nutrient analysis to guide crop nutrition across the farm with bespoke Offtake and Benchmarking reports for 12 major and minor nutrients. To order your YEN Nutrition pack for 2023 seed/grain samples please visit - https://yen.adas.co.uk/yen-nutrition-signup.

NUTRI-CHECK NET

The YENs have revealed that there can be significant issues with a lack of checking crop nutritional decisions and strategies. Europe needs to increase crop productivity whilst reducing use of synthetic fertilisers and nutrient losses. The "NUTRI-CHECK NET" project is helping to build farm-level adoption of best field-specific nutrient management practices across Europe. Decision-systems and nutrition tools will be assembled by national experts from across Europe, including leading farmers, into a common online NUTRI-CHECK NET platform. Find out more and sign up for the newsletter at https://nutri-checknet.eu/.

NITROGEN CLIMATE SMART

The NCS Project is funded by the DEFRA FIP & delivered by IUK. It aims to unlock the benefits of pulses in UK agriculture through their ability to bring N into the rotation and as a replacement for imported soy animal feed. Farmers can get involved by joining the PulsePEP to carbon baseline their farms through Farm Carbon Toolkit and, or, run pulse field trials through BOFIN. The trials investigate benefits of pulses as previous crops, and can be modified to suit your interests. The YENs are used to monitor the crops. Best yet, BOFIN will pay farmers for their involvement!

YEN DYNAMIC BENCHMARKING

Dynamic Benchmarking is a free tool for current and past YEN entrants that helps to make comparisons across farms, fields, crops, and years. This should help YEN entrants improve future decision-making for nutrient inputs, along with learning about soil type and yield information. The latest version will be available for demonstration at the YEN Conference followed by release in Feb'24, with an ambition to add more parameters from this report in future releases.

CONTACTS

Please send any comments, observations or queries to the contacts below.

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YEN SPONSORS

The YEN was initiated by industry and is entirely industry funded. We are most grateful to all our sponsors. They not only provide funding but they are fundamentally involved in management of the YEN and in supporting individual farms in making their YEN entries. The YEN would not exist without them!

Visit www.yen.adas.co.uk for sponsors' details, news updates and to register for 2024.