

## Session 1: What we learned from 10 years of YEN

Chair:

Tim Isaac Associate Partner, Ceres Rural

Introduction: Roger Sylvester-Bradley ADAS Head of Crop Performance







## Measuring ... Learning ... Sharing ... Improving























YEN



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## **North American YENs**





## YEN Potential yields – indicate scope for progress

## Wheat over 10 years to 2022

- 940 yields with met & soil data
- Average Potential Yield 18.1 t/ha
  - Range = 9.1 to 26.8 t/ha
- Average Field Yield 10.9 t/ha
  - Range = 3 to 16+ t/ha



## YEN cereal yields exceeding 14 t/ha ... 2013 – 2022







YEN

 Year
 Region

 16%
 Farm

 24%
 Field

 24%
 Field

 50il
 3%

 2%
 Previous

 2%
 Crop

 2%
 2%

## YEN Agronomy discoveries ...

## **Cereal YENs**

- A very significant "Farm Factor"
  - Potential yields are high ... big yield gaps common
  - and 14 t/ha is achievable almost anywhere
  - Important associations with:
  - Soil water supply
  - Use of organic materials
  - Soil P
  - Earlier sowing
  - Lower seed rates, & narrower rows
  - Use & frequency of nitrogen, fungicides & PGRs
    - ... Attention to detail rather than high inputs
  - Dry & warm winters, cool springs, bright summers
    - Soil drainage (& rooting?) important.

### **YEN Nutrition**

- Grain analysis can check ...
  - All nutrient offtakes (standard figs overestimate)
  - Sufficiencies of most Nutrients
- Most crops deficient in 1 or more nutrients
  - Phosphorus commonly below critical threshold

#### YEN Zero

- Crop GHG emissions largely driven by N fertilizer manufacture and N<sub>2</sub>O from fertiliser & manures
- Reducing diesel use in operations & grain drying can achieve useful reductions
- No relation between yield and GHGs per tonne



YEN

## New YEN 'ideotype' for Beans ... from 2019–2021 harvests

- Average YEN yield 5 t/ha
- Best yields 8 t/ha (winter), 7.2 t/ha (spring)
- High yields in both W & S Beans relate positively to later growth:
  - plant height, biomass / shoot,
  - seeds / pod, thousand seed weight,
  - harvest index and total straw biomass (t/ha)
- So ... our new Bean YEN ideotype has:
  - Tall multi-noded stems
  - Prolonged canopy survival
  - Deep roots.





## New Wheat 'ideotype' from YEN for ~15 t/ha 2013 – 2022 data

- **Soil**: think subsoil moisture ...
  - know soil capacity / drainage / build organic fertility (for P) / set & check rooting targets
- Choose **Sow Date & Variety** to set Earliness:
  - aim for GS31 in early April, GS61 in early June, harvest in mid-August.
- Establish an even & robust plant stand: ~180 plants/m<sup>2</sup>
  - Look for early root exploration & ample tillering & ongoing nutrient uptake
- Build even & good tiller survival (bright springs help): supply regular N & PGRs
  - Aim for 600 fertile shoots ~0.7m tall to allow a full green canopy providing ample biomass growth and 'momentum' for floret survival (in May)
- Ears with ~20 spikelets & 2-3 fertile florets per spikelet at flowering ... giving >30,000 grains/m<sup>2</sup>
- Canopy holding ~200 kg/ha N & without any nutrient deficiencies by flowering
  - Provide further P & N availability to avoid early remobilization / senescence
- Look for root system to ~2m depth at flowering, and subsoil still holding 150 mm water (and nutrients) at flowering (&/or rainfall)
- Good canopy greenness at least until milky ripe ... expect N & P to be redistributed.





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## **YEN Ideas & Discoveries**

- Potential yields
  - Resources of Light & Water
- Crop Ideotypes
- Crop Momentum
  - Balancing Source & Sink
- Physical grain analysis
- Grain nutrient analysis
  - Nutrient Harvests
  - Nutritional post-mortems

- The Farm Factor
- Importance of shoot & ear numbers & total biomass
- Subsoil water capture
- The P capture challenge
- Barley's Mn shortage
- Non-lodging PGR effects





## Session One: What we learned from 10 years of YEN

Chair: Tim Isaac Associate Partner, Ceres Rural Roger Sylvester-Bradley ADAS Head of Crop Performance Liam Wilkinson Limagrain Development Officer – Arable Crops Jennie Watson Hutchinsons' Development Manager Tim Lamyman Lamyman Worlaby Farms, Lincolnshire Adrian Joynt Apley Estate, Shropshire David Passmore May's Farm, South Oxfordshire

## PLAN: Tim: Introduces our panel ..

- Ron: Arable Technical Manager for Limagrain
  - Communicating plant breeding & GxE, has sponsored Tim

#### • Jennie: Hutchinsons development manager

- Extension / developing and managing inputs .. has sponsored Tim

### • Tim L:

- Arable farm on Lincolnshire Wolds. Joined YEN in 2014, av YEN yields 14.6 t/ha (81% PY), inveterate YEN winner, record breaker & innovator

### • Adrian J:

- AHDB Monitor farmer 2016-9, Apley Estate, Bridgenorth
- Joined YEN 2017, av. YEN wheat yields 9.6 t/ha (53% PY); now sponsored by BASF (in Real Results)

## • David P:

- Traditional beef and arable farm in S. Oxforshire. Joined YEN in 2018, incl YYT, without sponsor; av YEN wheat yields 11.7 t/ha (69% PY); Bronze cereal winner in 2019; innovator of the year in 2021.



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#### Entrant's Report

Harvest 2022

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#### Entrant's Report Harvest 2022

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Entrant's Report Harvest 2022

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## **Limagrain Field Seeds Research**

A worldwide organization

#### **70** Breeding Centers & Trialing stations



- Plant rapid cycling
- Genetic modification & Gene Editing



9 Species200 Varieties launched each year

> 1,000 employees across all continents

4 8 1



\* IFRS11 + JV on owned at 50%

Limagrain Field Seeds

Limagrain 🧭



## Our vision

Contribute every day to the progress in Agriculture



Develop innovative solutions centered around genetic and agronomy



Contribute to the **sustainable performance** of the farms



Meet the **societal and environmental challenges** of tomorrow's Agriculture



Limagrain 🥑

Limagrain Field Seeds

# Limagrain YEN Sponsorship – Why?

- We like to be involved and participate (10 years)
- **To be part of a collaborative project –** Research, Industry, agronomists and growers all working together for one goal
- Opportunity for all sectors to learn, question and implement ideas for securing and raising yield on farm
- Variety evaluation of requirements and performance in an evolving agricultural landscape
  - Government policy / single farm payment / water contamination / reduced inputs
- Data collection
  - Variety interaction regional, soil type, weather, agronomics, benchmark performance
- Marketing grower stories around LG varieties always good PR

Limagrain Field Seeds



## Supporting grower agronomist dialogue

- Increased level of field/farm detail to push yield
- Post mortem of the season
- Trying out different things
- Increased awareness of importance of measuring and sampling
- Generating interest





## Benchmarks

- Importance of biomass
- Focus ahead of GS 30
- Variation in limiting factors
- Attention to detail
- Influenced open day discussions





## Tim Lamyman: Lamyman Worlaby Farms

- Two Farms:
  - 600 ha grade 2 to 4 Lincolnshire Chalky wold land near Louth & 120 ha pure blow-away sand at Tumby
- 250 ha winter wheat, 140 ha winter barley
- 150 ha winter oilseed rape, 40 ha spring barley
- 40 ha combining maize, 20 ha spring wheat
- 50 ha woodlands and ponds

No Stone Left Unturned ... **YEN** – Sunlight, Water and Report **Soil – Compaction** Variety choice – Date, Rate & Biomass **Smart nutrition – Value added** Fungicide choices – Aim for variety weaknesses **Root structures Prolonging green leaf area** 



## Apley Farms

- 1244 ha, located north of Bridgnorth in Shropshire
- Mainly medium/light soils
- 750 ha of Combinables, 120 ha let for Potatoes/Salads, 374 ha Grass
- 500 head of cattle
- Wheat, Potatoes/Salads, Wheat, Barley, OSR on irrigated land
- Wheat, OSR, Wheat, Beans on heavier land
- Focus on soil health



## How has Apley Farms benefited from YEN?

- Detailed analysis
- Moisture
- Biomass
- Attention to detail
- Networking and shared knowledge
- Encourages innovation
- Rise to the challenge



## David Passmore, May's Farm, near Wallingford, Oxfordshire

### 300 hectares

-in the Chilterns Area of Outstanding Natural Beauty in South Oxfordshire

### All Grade 3 soils

-shallow Andover series soils with flint over chalk or gravel

### Mixed farming

-Ewe flock and

-Pedigree Limousin suckler herd

-on rotational grass leys in arable rotation

### Arable crops

-W Wheat / Spring Barley / Peas / OSR

-Almost all early generation seed.



## David Passmore, May's Farm, near Wallingford

- Initial intrigue ...
  - 'What is YEN?' ... & how am I doing as % yield potential?
  - Some 20 YEN entries later ...
- Technical Points
  - importance of phosphate, magnesium (OSR),
  - Wheat: now target 30,000 grains/m<sup>2</sup> ... and 15 t/ha, even if not achieved yet!

#### Farm Factor

- YEN shows chucking inputs / money at crops doesn't necessarily buy yield
- But the farmer (me) is one of the most important factors and as a result really focuses you on how you manage your farm – especially long term
- Now asking questions & carrying out trials
  - would never have come about without YEN involvement / analysis



