



# Fertiliser savings in break crops and by spreading fertiliser evenly

Dermot Forristal, Sheila Alves, Shiva Rahimi Tanha,  
CELUP, Oak Park Crops Research

# Three Fertiliser Questions

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***How do we utilise Oilseed Rape to optimise N use?***



***Can we save N by using legumes in rotations?***

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***Can we spread all fertiliser types (incl. Urea) evenly?***

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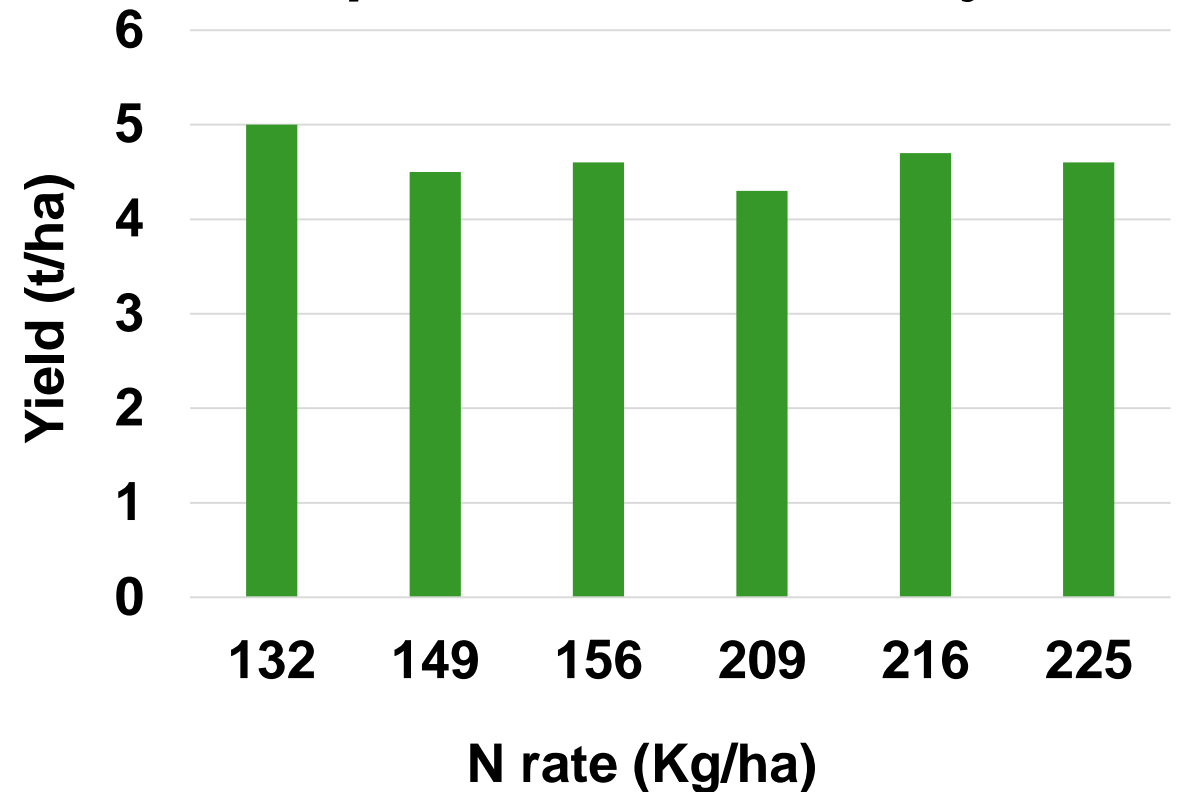
# 1. Oilseed Rape can capture and use N

## **Canopy management approach**

- ◆ Canopy N (GAI) remains in the crop.
- ◆ Each unit of GAI contains 50kg of N
- ◆ Crop requires 3.5 GAI at flowering
- ◆ Applied fertiliser efficiency of 60%
- ◆ Each 1t yield >3.5t/ha needs 60Kg /ha
- ◆ UK developed system validated.



## **Fixed and Canopy management impact on N rates and yield**



# GAI: 0.6



# GAI: 2.1



# Save Fertiliser N if post-winter crop size allows

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Crop	Small	Medium	Large	V. Large
CROP GAI (units)	<b>0.5</b>	<b>1.0</b>	<b>1.5</b>	<b>2.0</b>
Crop N (kg/ha)	25	50	75	100
SMN (estimate, kg/ha)	45	40	35	30
Target N for 3.5 GAI (kg/ha)	175			
Extra N for 4.5t yield (kg/ha)	60			
Required Fertiliser N (kg/ha)	<b>235</b>	<b>202</b>	<b>168</b>	<b>135</b>
<b>Saving in N Cost (€/ha)</b>	<b>-</b>	<b><u>€83</u></b>	<b><u>€168</u></b>	<b><u>€250</u></b>

# Conclusions: OSR N

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## 2021 / 2022 season

- ◆ Exploit the N in the crop
- ◆ Do not waste money on excess N that may cause a reduction in yield

## Future seasons:

- ◆ Potential will vary with season: sowing early allows it to be exploited
- ◆ But you must reduce N if you have it in the crop or soil
  - ◆ Avoid excessive canopy size at flowering: poor pod fill, lodging.

## 2. Saving N by using Legumes in Rotations

- **Legumes fix atmospheric N**
  - N available to growing Legume
  - Residual N available to subsequent crop
  - Grain producing crop (Beans, Peas, Lupins)
  - Cover crop (Vetches, Clovers etc)
- **Europe is deficient in proteins**
  - Protein payment scheme continuing



# Legume rotations spare N use

## Rotation, crop and applied N (kg N/ha)

Year	Continuous WW	Rotation with OSR	Rotation with Beans
1	WW 230	OSR 225	Beans 0
2	WW 230	WW 200	WW 200
3	WW 230	WO 165	WO 165
4	WW 230	WW 230	WW 230
5	WW 230	WB 200	WB 200
Total N	<b>1150</b>	<b>1020</b>	<b>795</b>
<b>N Saving (%)</b>	<b>-</b>	<b>11%</b>	<b>31%</b>



# *Change to use more legumes*

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- ***Rotation limitations ( 1 year in 5)***
  - Must be respected
- ***Reputation for variable performance***
  - More variation locally than nationally
  - Beans: dry years medium textured soils?
  - Address with research and good management decisions
- ***Inappropriate focus on single year crop performance***
  - Does not value benefits to subsequent crop or rotation:  
(Knockbeg research: +19% yield; + €208/ha rotation margin )
  - Focus on entire rotation and long term sustainability.



# 3. Can we spread Urea evenly

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## Urea is cheaper!

### 2021 / 2022 fertiliser prices

- ◆ CAN                                    €675/tonne = €2.50 / kg N
- ◆ Protected Urea                    €1000/tonne = €2.17 / kg N



## Significant annual savings

	CAN	P. Urea	Saving
<b>Winter Wheat</b> 250kgN/ha	€625	€542	€83/ha
<b>Spring Barley</b> 165kgN/ha	€413	€358	€55/ha

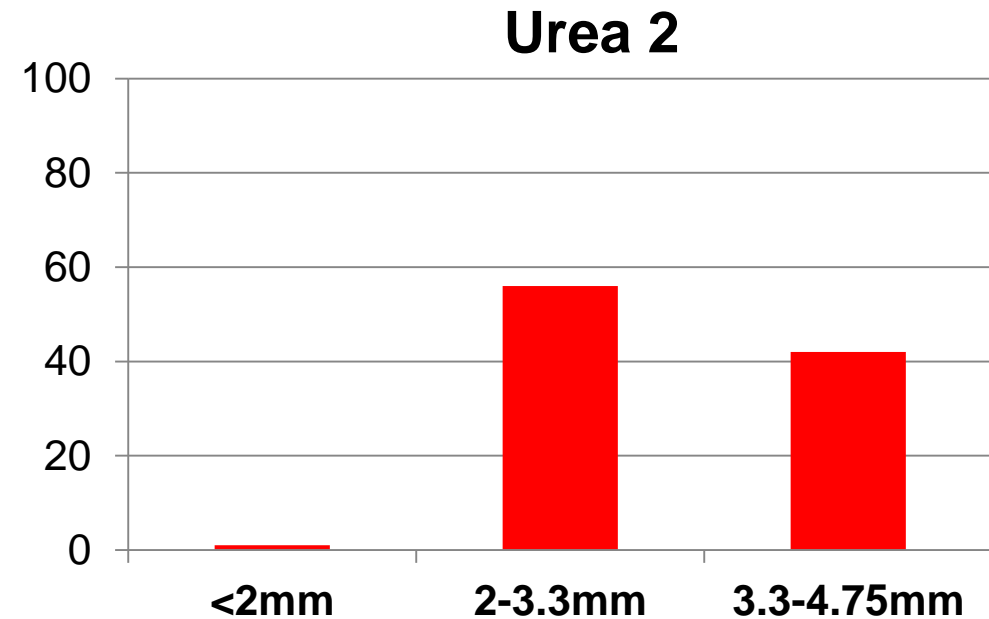
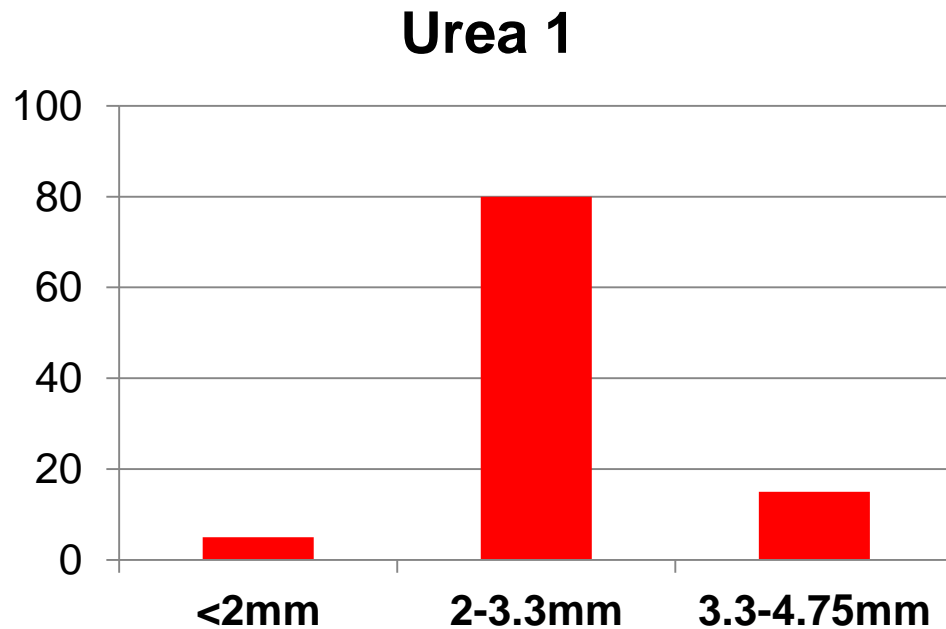
**But can we spread urea evenly at wide bout widths?**

# Urea has a lower density – 80 % of others

- More difficult to throw
- More influenced by wind.



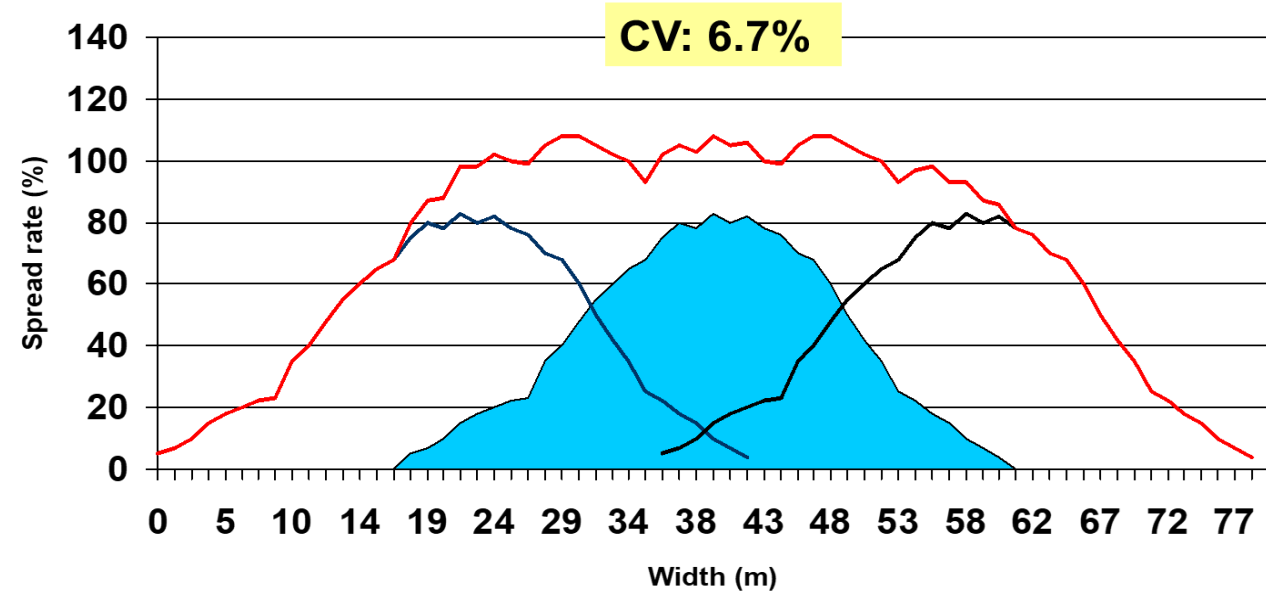
◆ Get good quality UREA – large and strong particles !



# Use a Good Spreader .....for Urea!

## ■ Good basic spread pattern

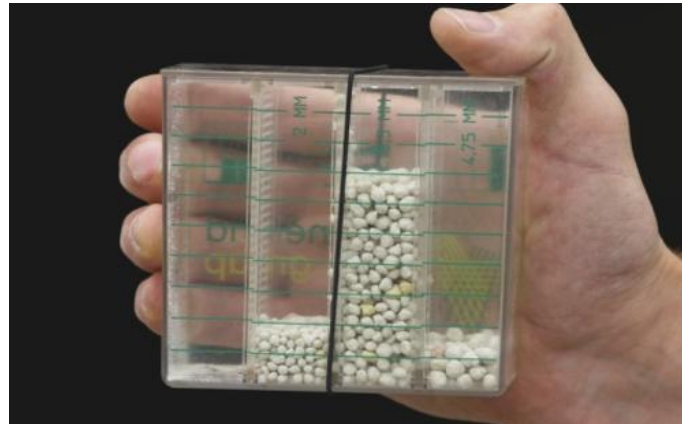
- Triangular – wide base and overlap
- Capable of bout width with Urea
- Supported by test results COV <7%
- Supported by fertiliser test database



## Match Urea to tested product.

### Characterise

- Size
- Strength
- Shape
- Density



# Match to Database via App / On-line

1 2 3 4 5

Machine >> Field settings >> Fertiliser properties >> Fertiliser list >> Chart


RO-M GEOspread - Basic application | 18 mtr | 200 kg/ha | 12 km/h

Granule size (mm)      < 2    2-3,3    3,3-4,75    > 4,75    Sum

Distribution (%)                     

Density       kg/ltr

[Explanation of distribution \(%\)](#)



Granular       Mineral       Prilled       Crystalline

Blend       Pellets       Seed/Slug pellets       All shapes

Next >>

## Will determine:

- If match available
- Bout width limit
- Specific requirements (discs/vanes)
- Spreader settings for bout



# Check Spread and extreme care with Urea

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- Check headland settings ( 40% differences)
- Use trays/mats to verify settings
  - 100ha: SB and WW fertiliser: **€71,383**
  - 3 hrs testing x €50 = €150: **0.2%**
- Be very cautious with wide bouts and wind
- Avoid using Urea 'blends' unless proven, as segregated spread patterns are possible.  
(N in different parts to P, K, S)



# Conclusions

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- **Oilseed rape's ability to capture and utilise N allows N savings**
  - Exploiting these savings will also protect yield potential
- **The use of Legumes can save fertiliser N.**
  - Legumes must be considered on a whole rotation basis
- **Urea can reduce costs but spreading quality is an issue.**
  - Choose urea with large-sized, strong, particles
  - Setting databases based on spreading tests are essential
  - Headland spreading for all fertiliser types needs to be addressed.

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