

Nitrogen rate and timing to achieve an optimum canopy size

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Oilseed rape – maximising yield

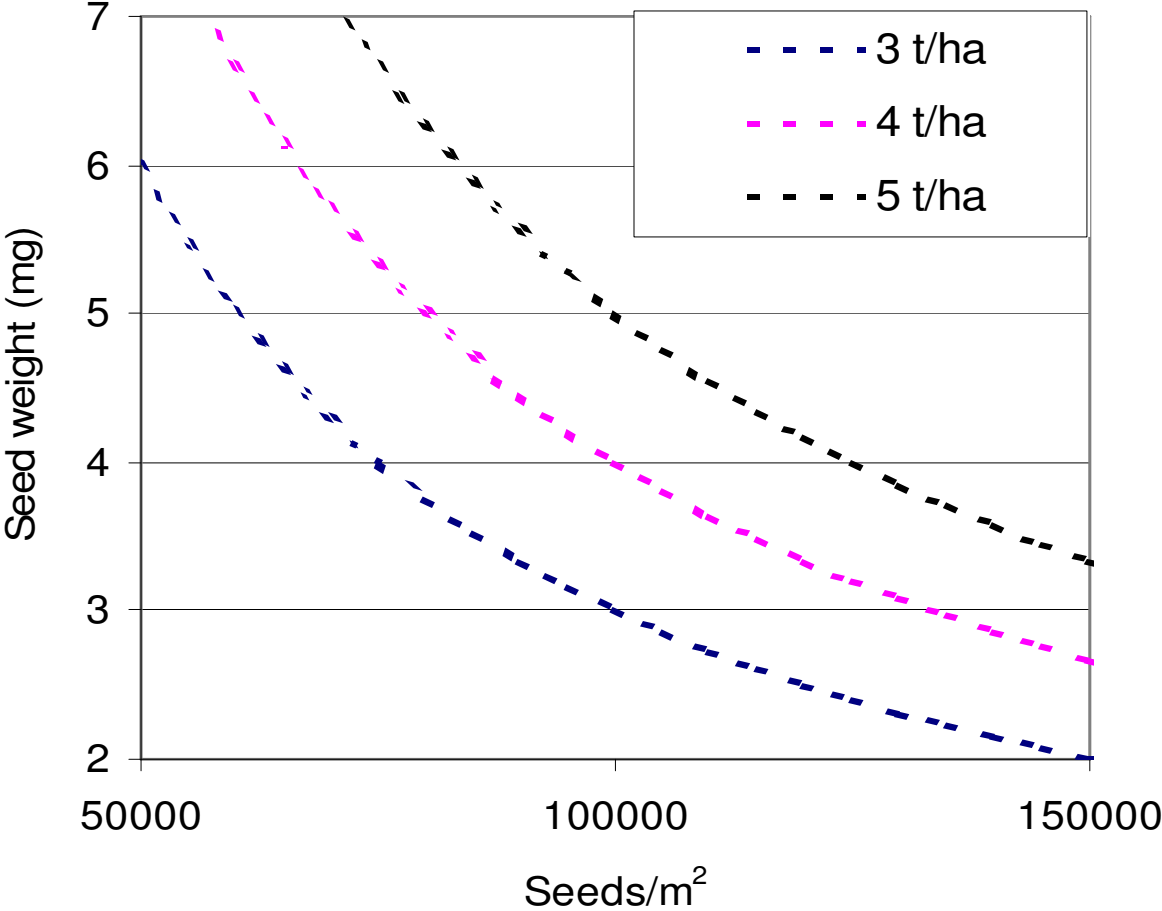


Components of yield

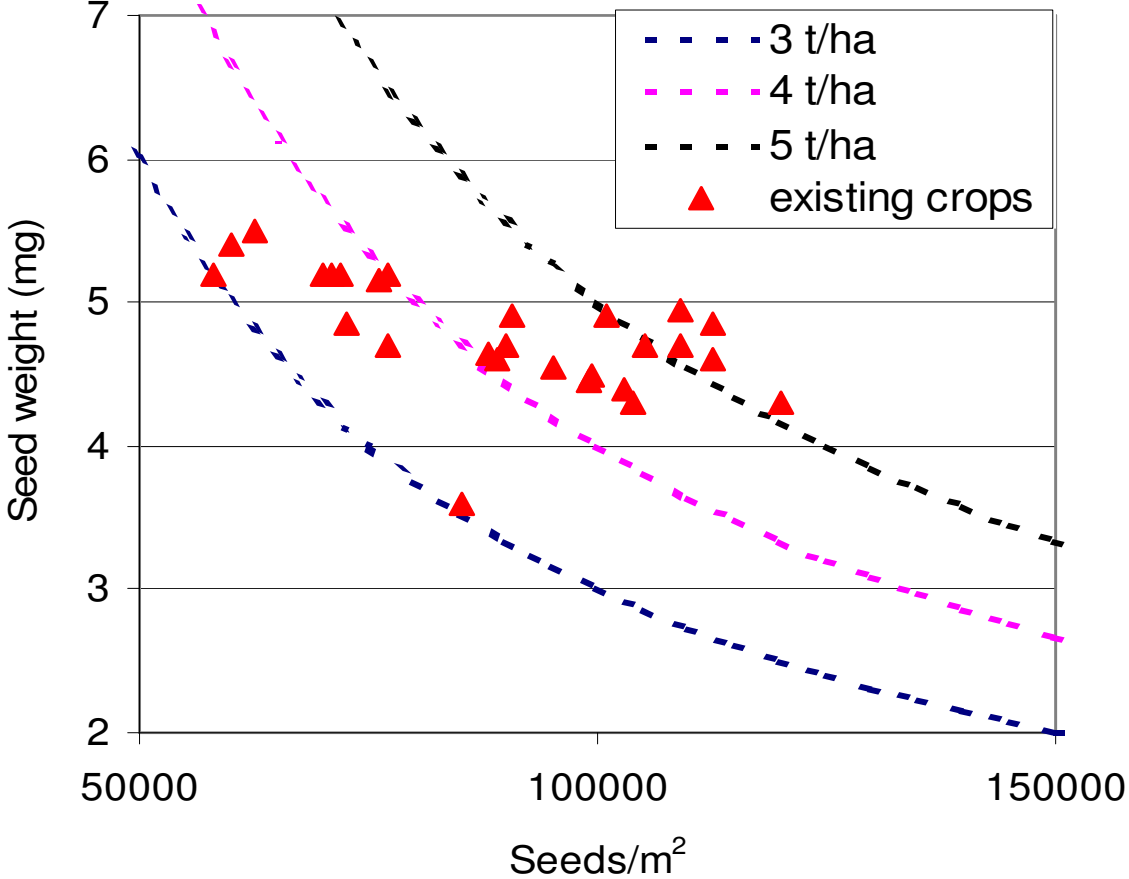
Yield = number of seeds x seed weight



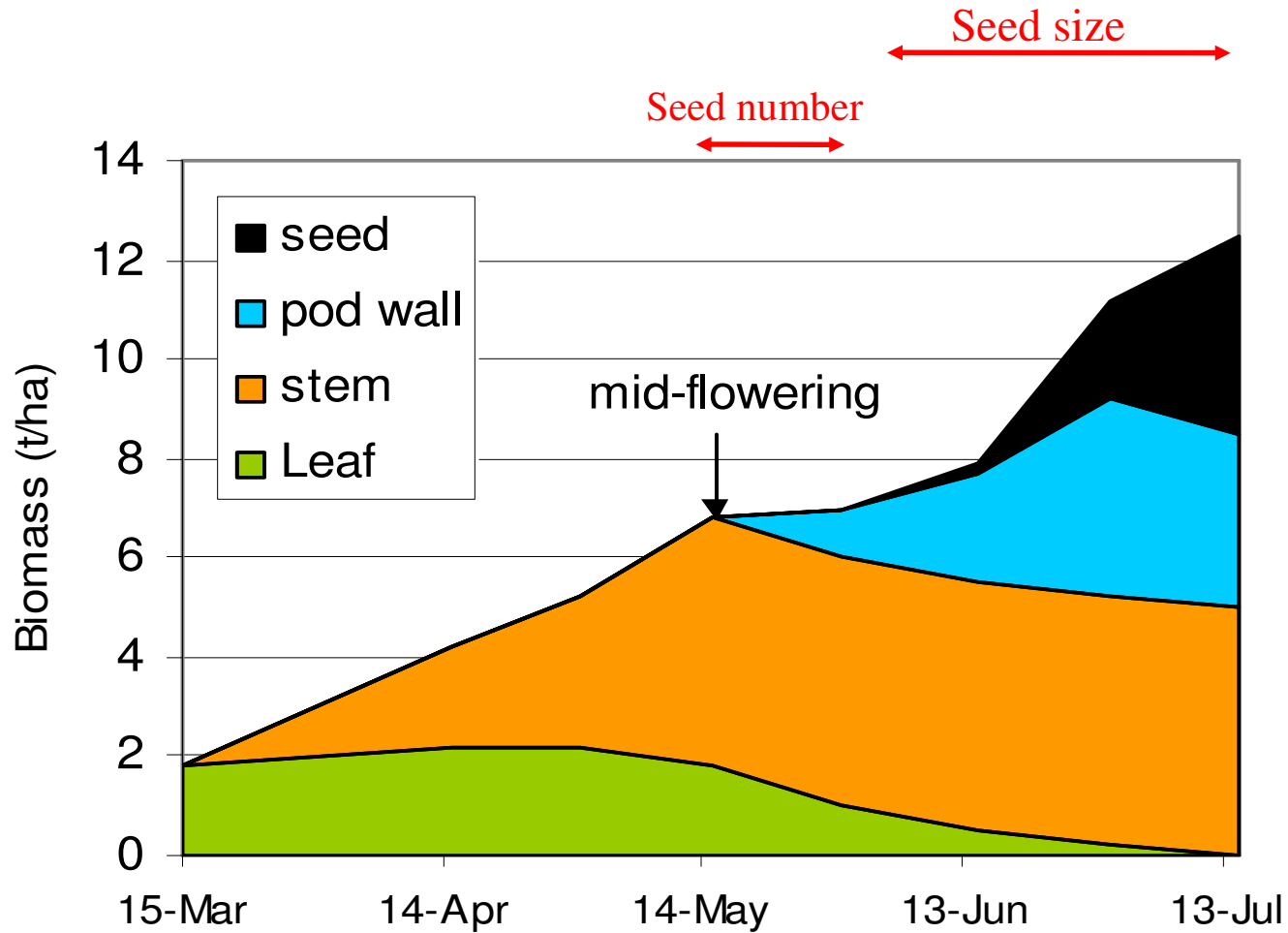
Components of yield



Components of yield



Phases of Growth

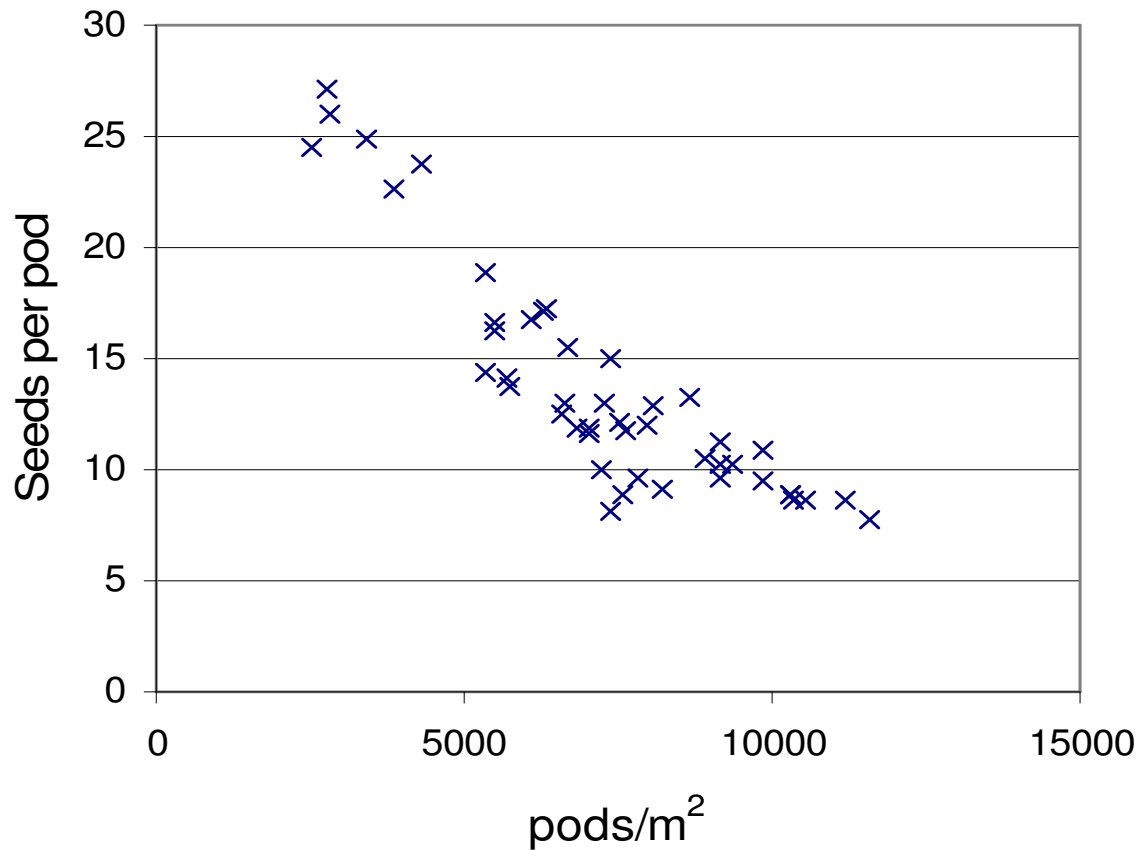


Seed number determination

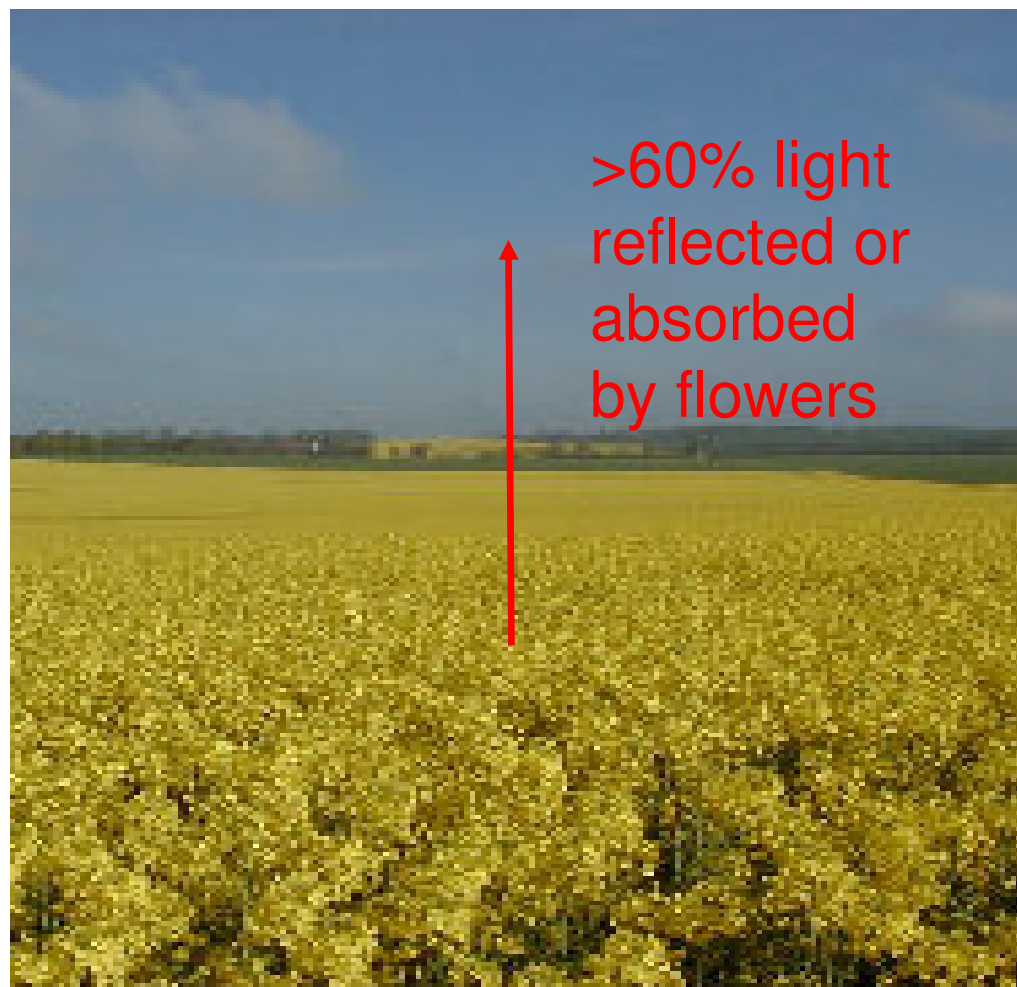
Determined by photosynthesis during a 200-300°Cd period after flowering (2-3 weeks)



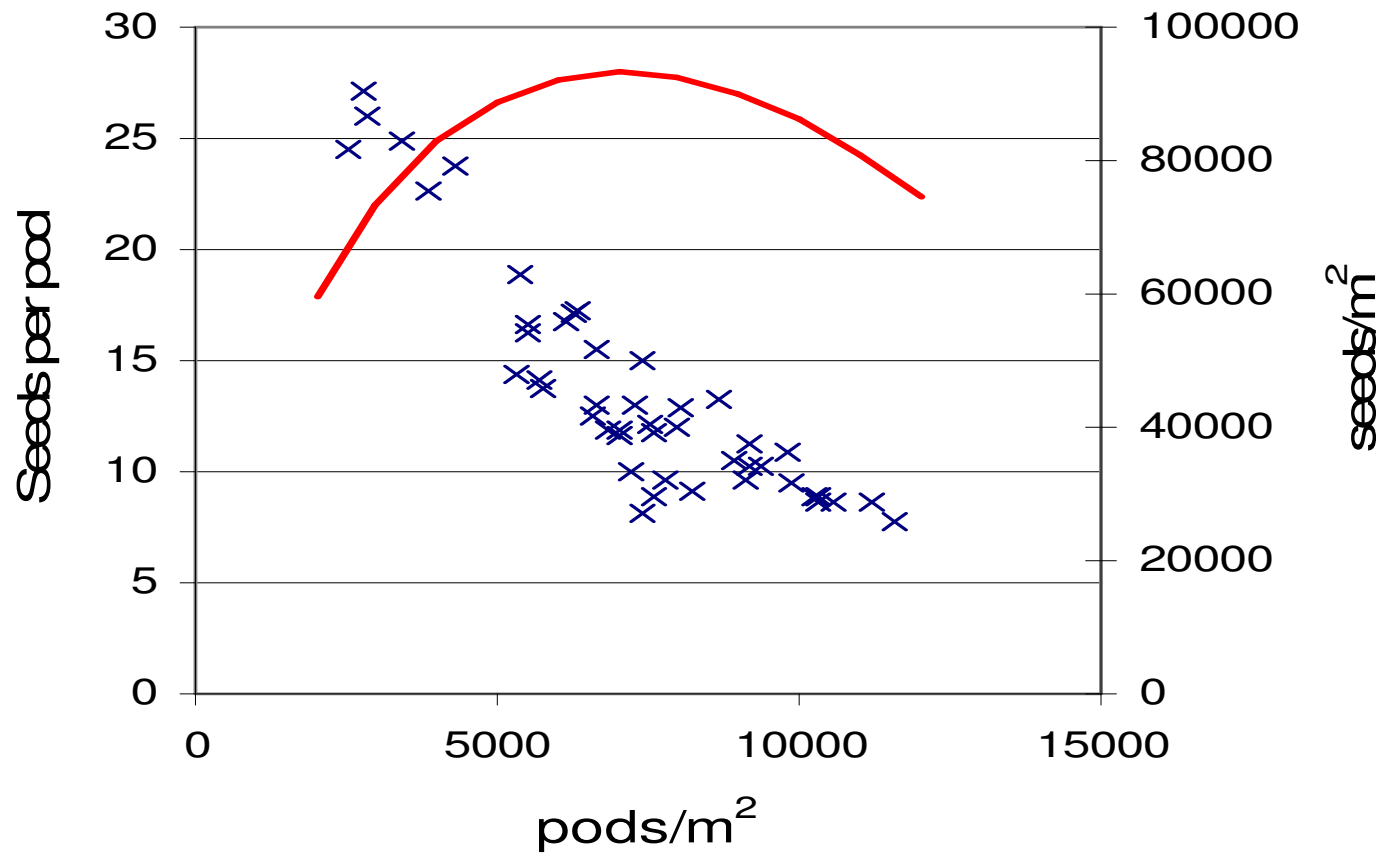
Pod & seed numbers



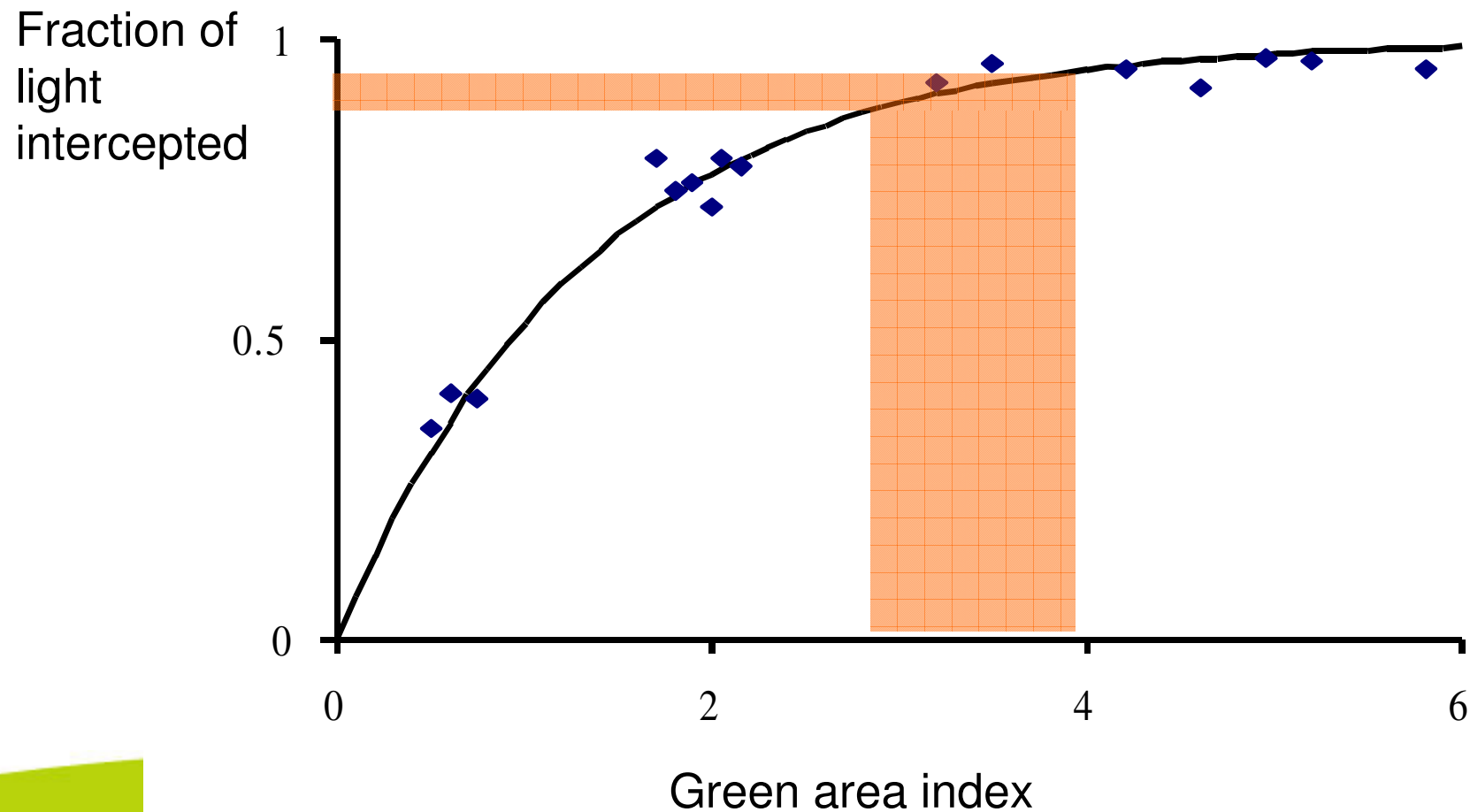
Over-large canopy



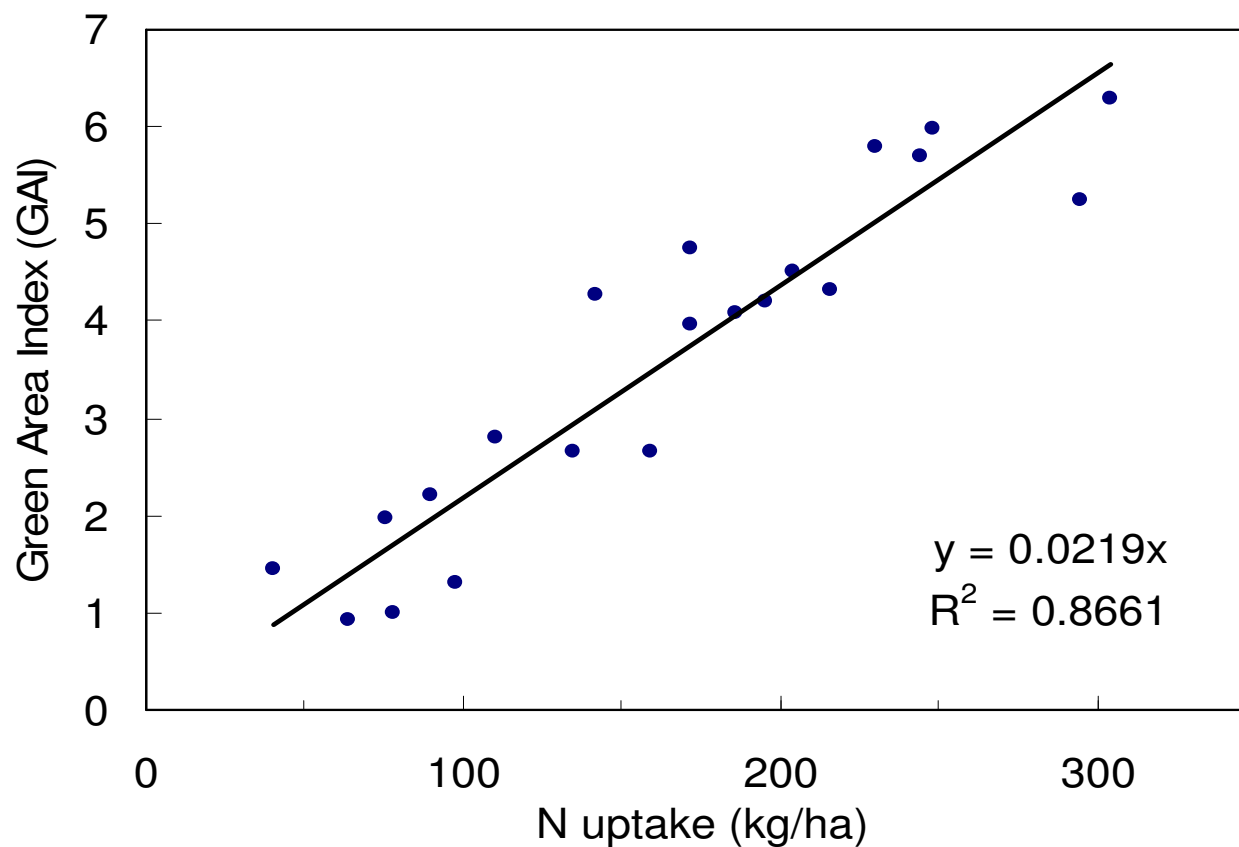
Pod & seed numbers



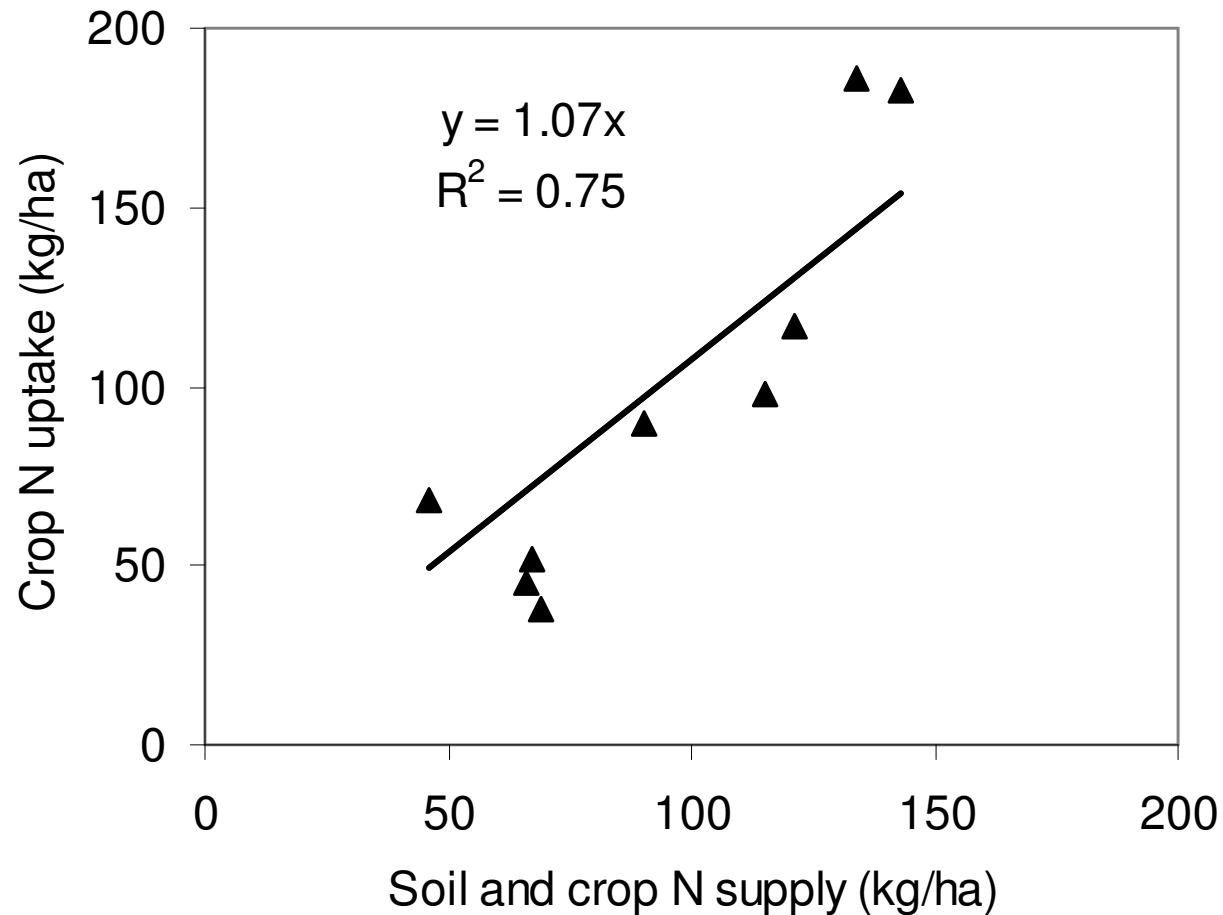
Maximise seed numbers by optimising canopy size



Canopy Nitrogen Requirement ~ 50kg N/GAI/ha



Apparent recovery of residual N



Relationship between the combined soil mineral N and crop N measured in February and the crop N uptake at harvest for crops grown at Boxworth, High Mowthorpe and Rosemaund in 2006, 2007 and 2008. Berry & Spink, 2009

Fertiliser N recovery

Mean across 9 sites at optimum N - 57%

- **2006 and 2007 - 63%, 2008 - 47%**
- **Mean at low N (100kgN/ha) - 67%**
- **Mean at high N (240kgN/ha) - 43%**

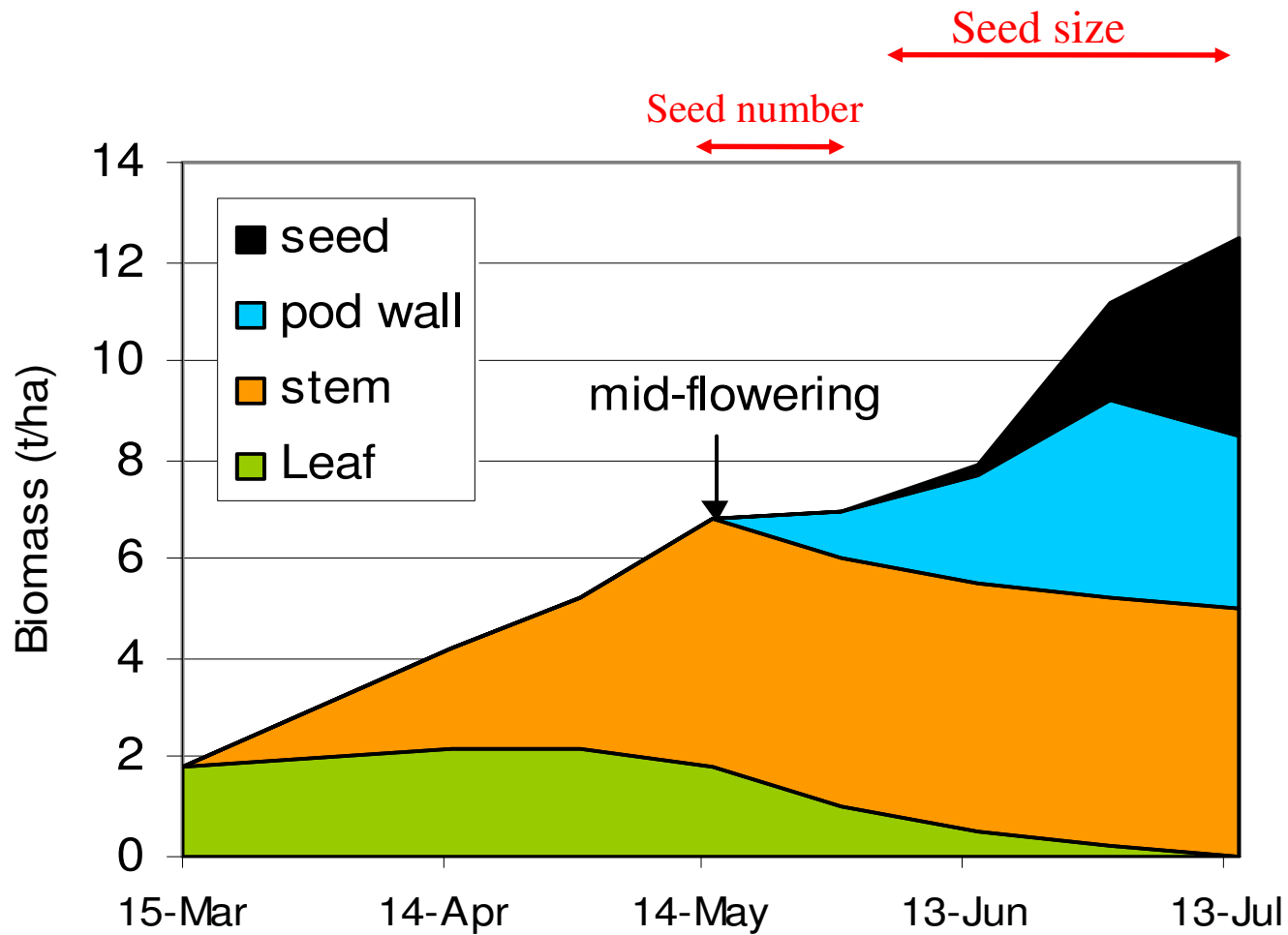
Optimising canopy structure - rules

- **Need GAI of ~3.5**
- **Takes 50kg N/ha to make 1 GAI**
- **Crop and Soil N used with 100% efficiency**
- **Assess crop N using
www.totaloilseedcare.co.uk**
- **Applied N use with 60% efficiency**

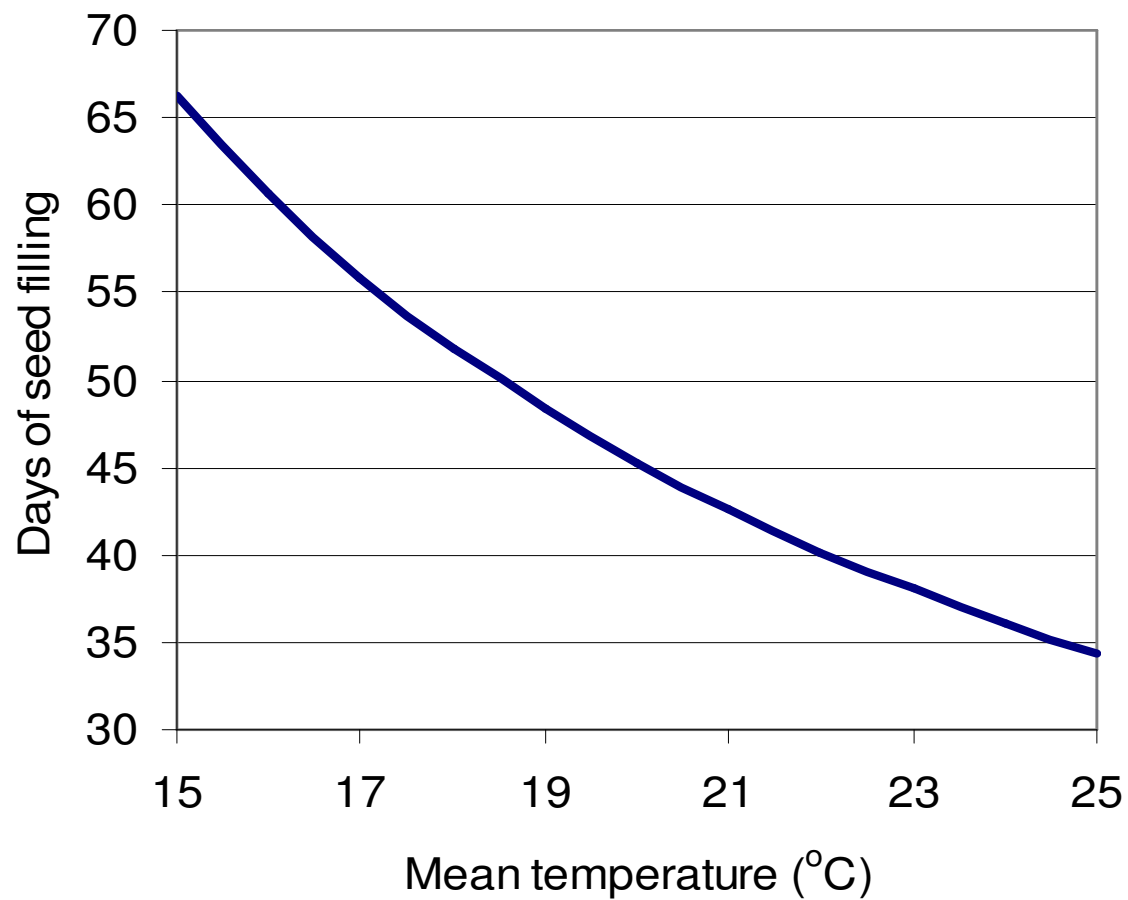
Calculating N inputs - Example

Target N needed in crop <i>(3.5 GAI x 50 kg N for each GAI)</i>	175 kg N/ha
<u>February</u> Crop N Soil mineral N	50 kg N/ha 25 kg N/ha
Shortfall <i>(Target N minus crop N & soil N)</i>	100 kg N/ha
Fertiliser requirement <i>(Shortfall ÷ 0.6)</i>	167 kg N/ha

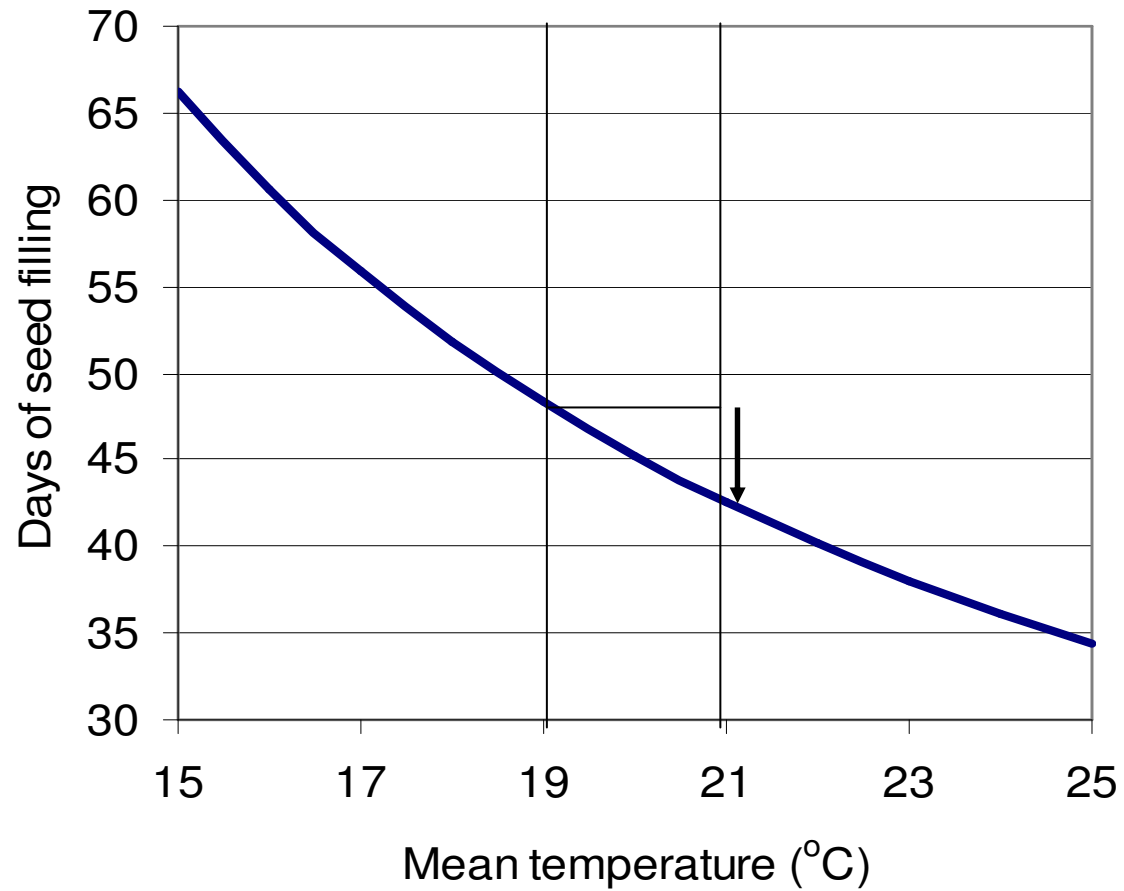
Seed Filling



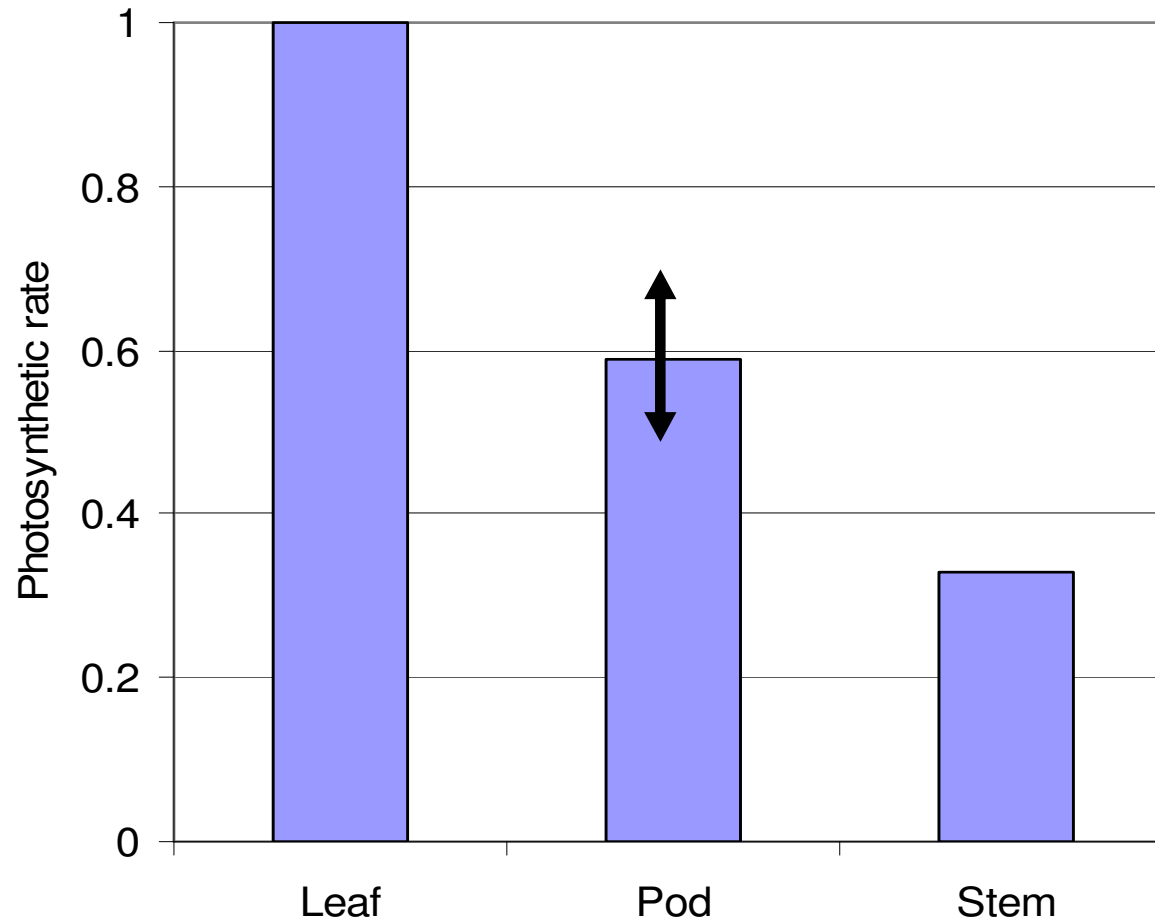
Duration of seed filling



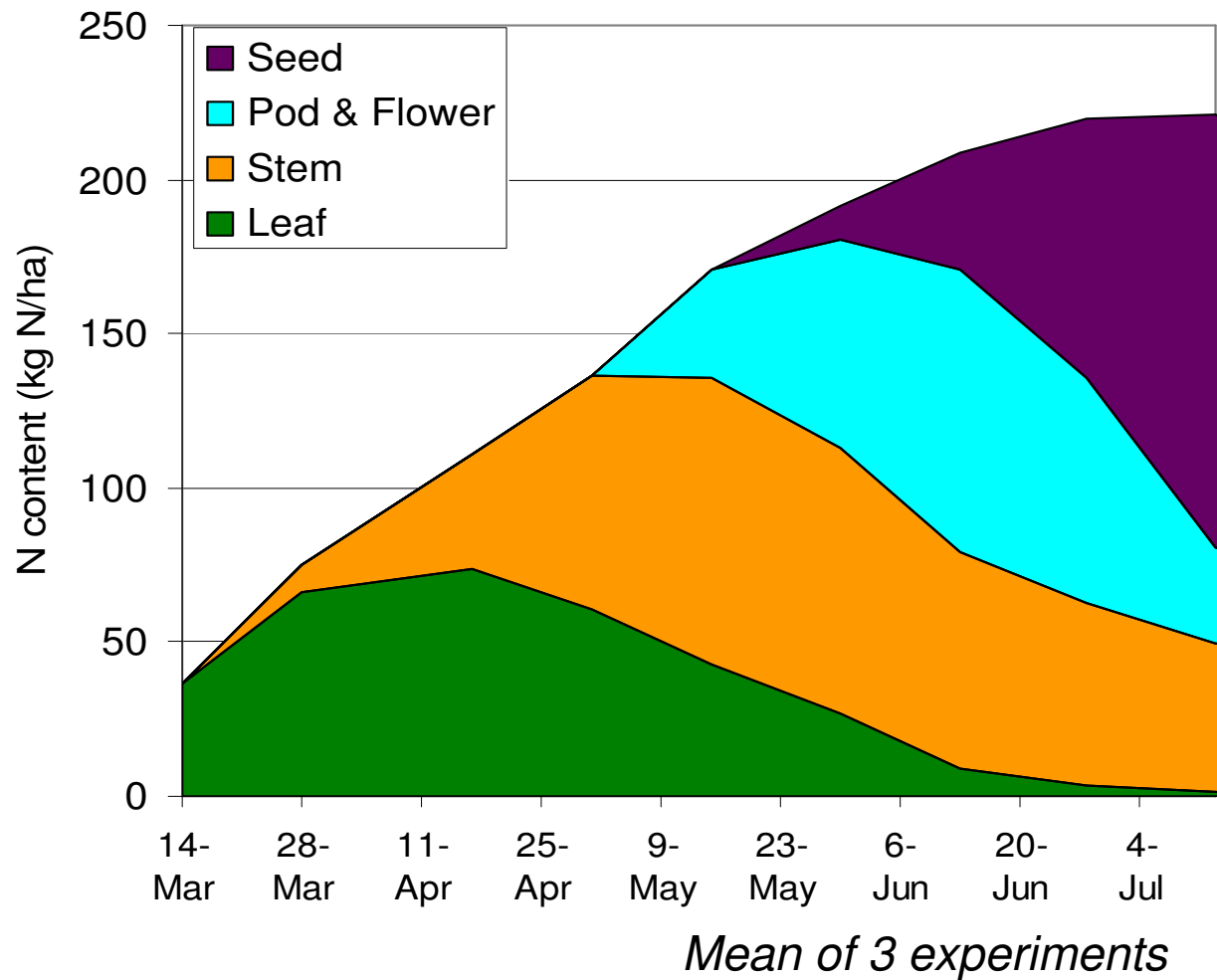
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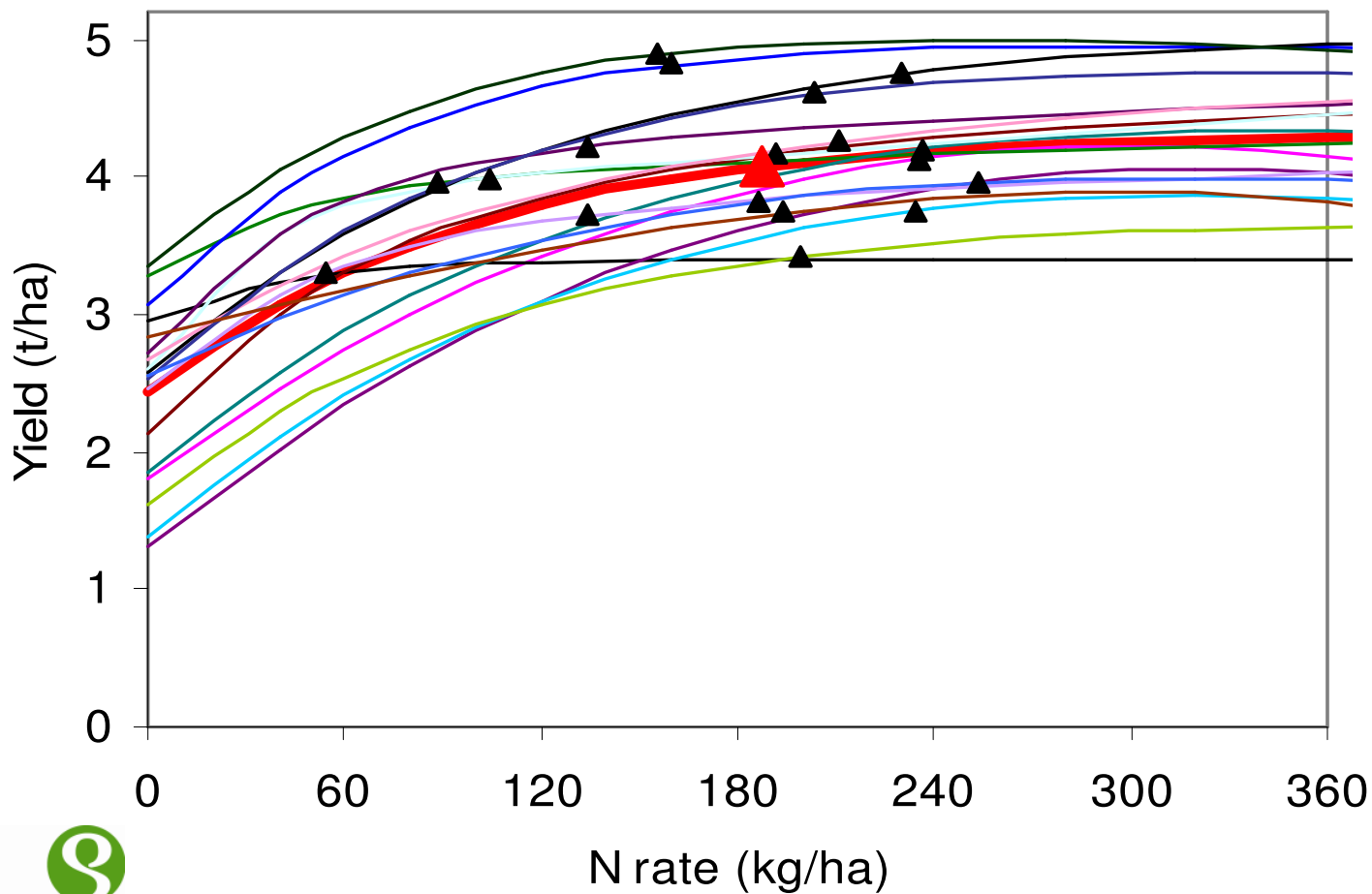
Photosynthesis



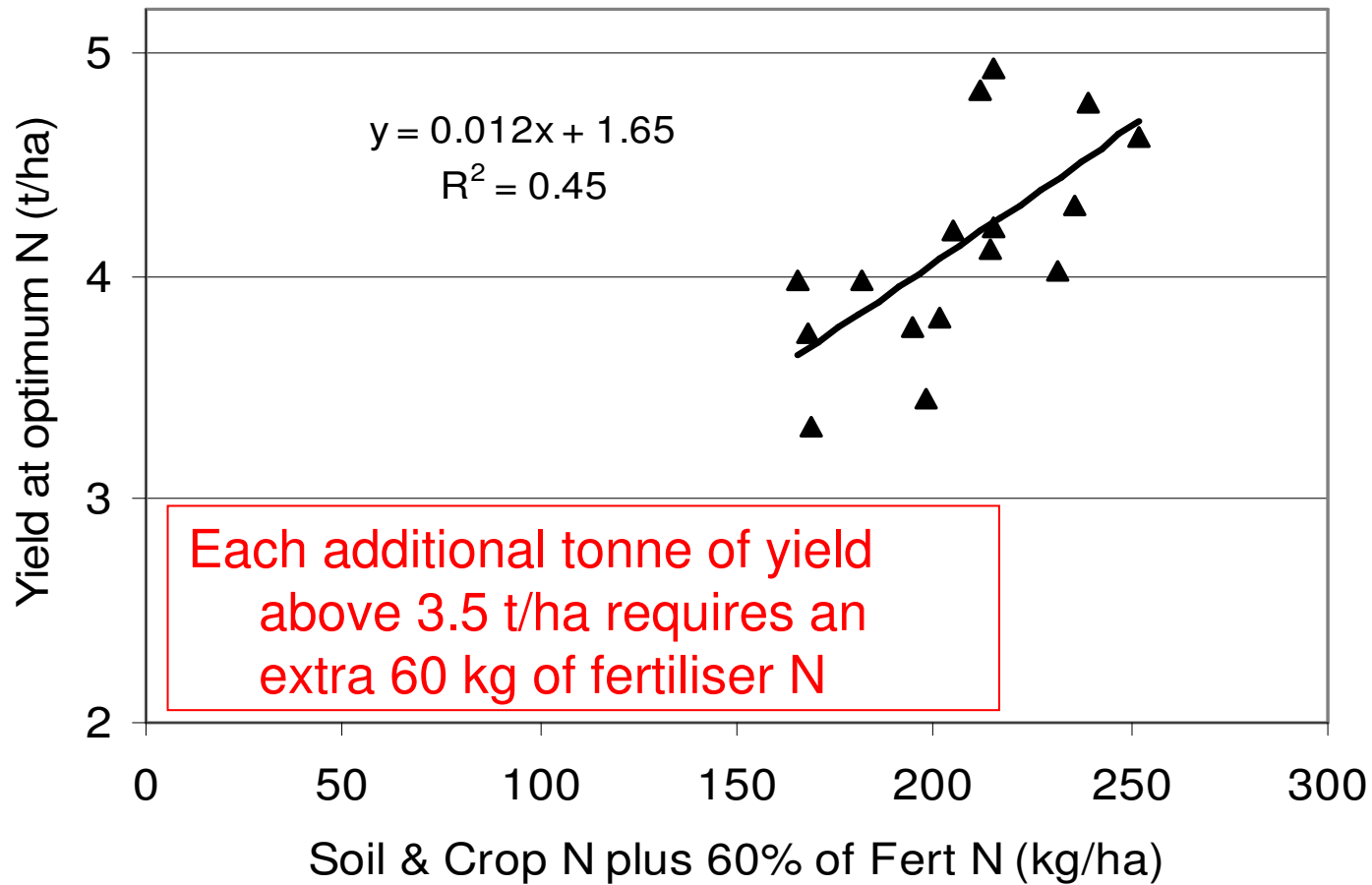
Additional N for high yield?



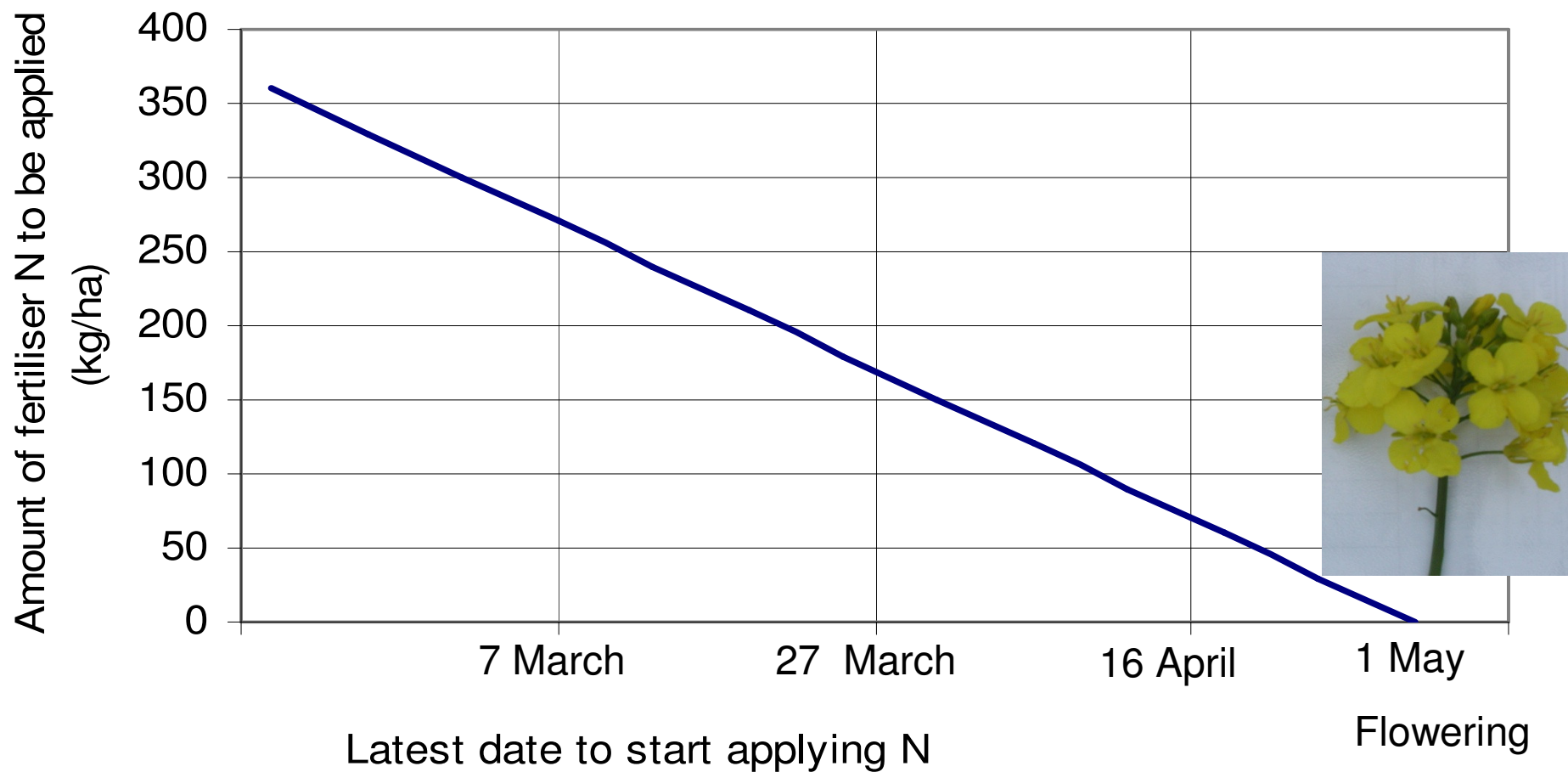
Accounting for yield potential



Accounting for yield potential



Latest safe N application dates



Predicting fertiliser N for yield

	Average N rate (kg/ha)	Average error for individual crops (kg/ha)	Yield (t/ha)
Exact - from N response curves	182	0	4.23
RB209	193	+/- 65	4.17
RB209 with SMN measurements	167	+/- 37	4.16
Canopy Management	188	+/- 28	4.23

Average over 9 experiments

N optima calculated on seed yield only

Fertiliser predictions assume a reasonable knowledge of the potential yield



Summary

- **Need to produce a moderate pod canopy
~7,000 pods, 3.5 GAI**
- **Early N encourages excessive flower and pod
production**
- **Late N required to maintain pod filling**