

Fertilizer N for Grassland in 2007

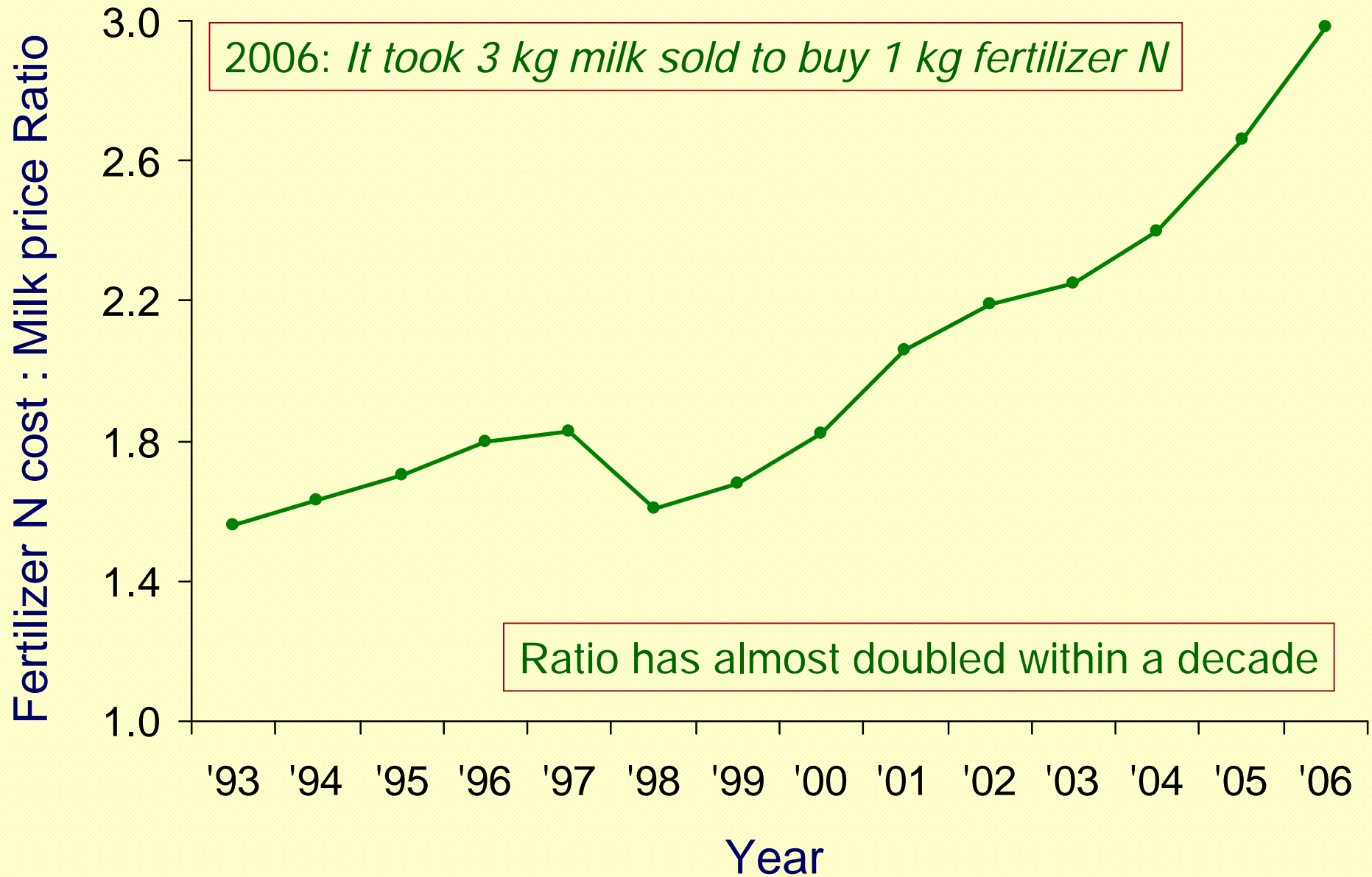


James Humphreys

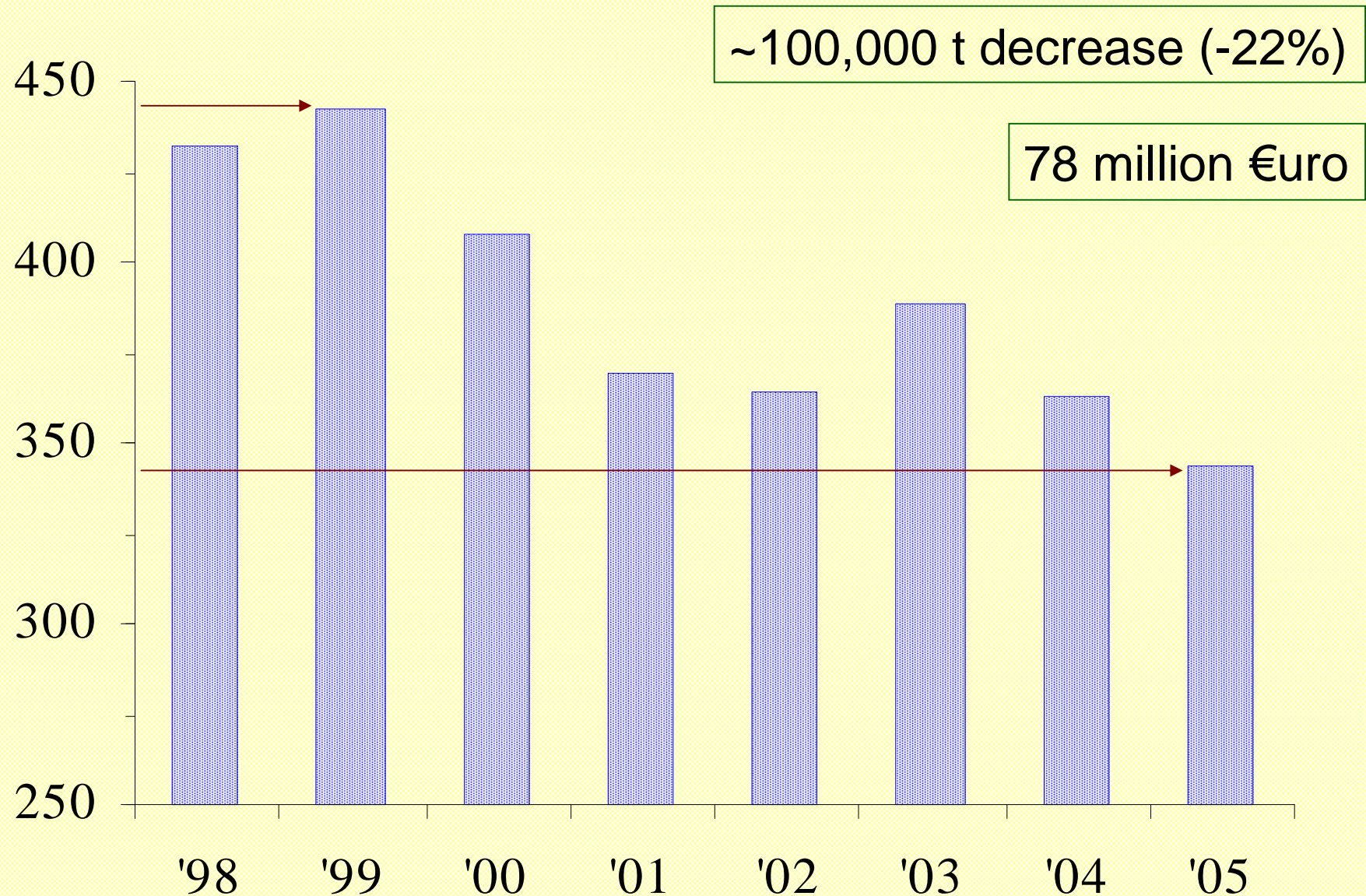
Moorepark

Dairy Production Research Centre

Fertilizer N cost : Milk price Ratio



Fertilizer N use in Ireland 1998 to 2005 (,000 tonnes)



Overview

Fertilizer N use on grassland in 2007

New Regulations

Economical fertilizer N use

Background capacity of soils to supply N

Managing Cattle Slurry

White Clover

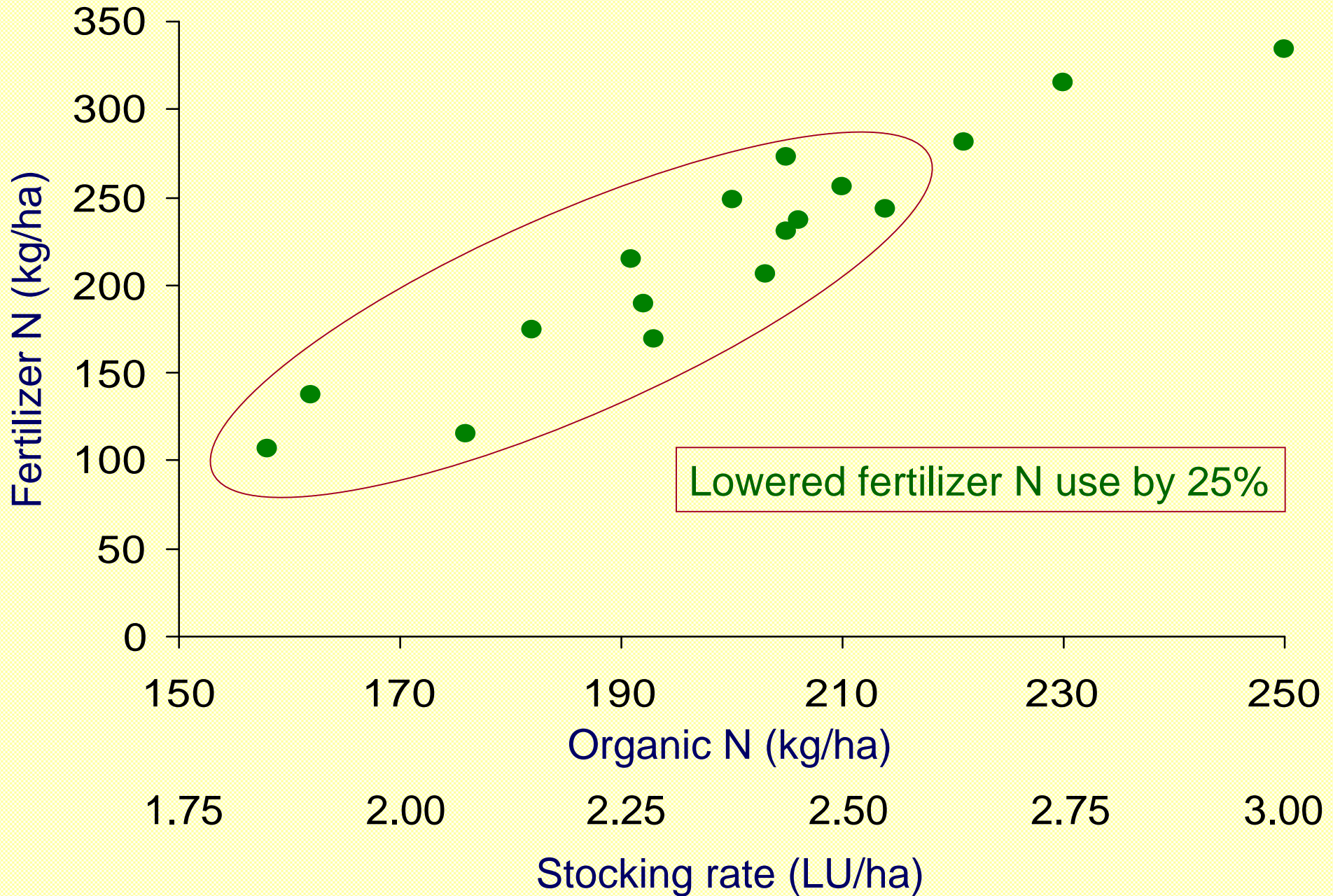
Recommended strategies at different stocking rates

Setting targets – cutting fertilizer N use by 25%

Fertilizer N Management on Farms

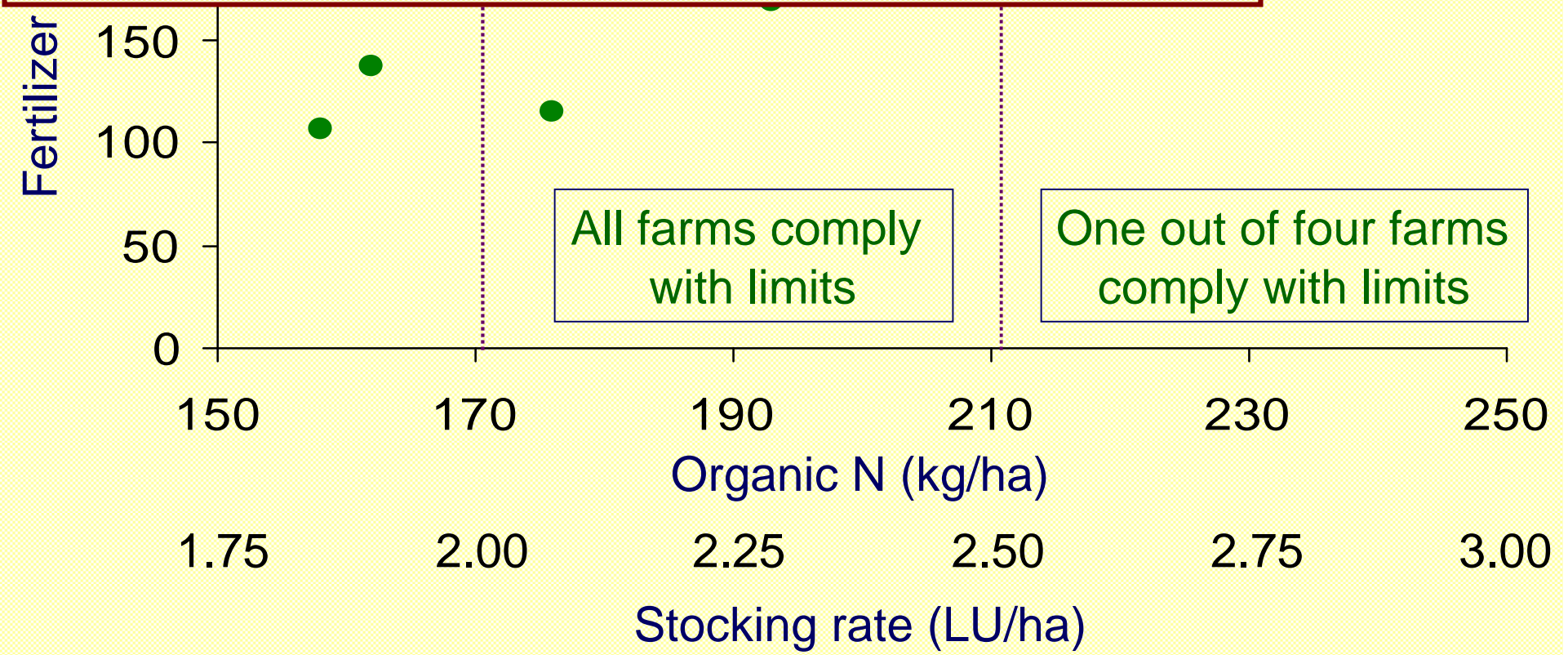


Stocking rate (Organic N) and fertilizer N use of 17 dairy farms

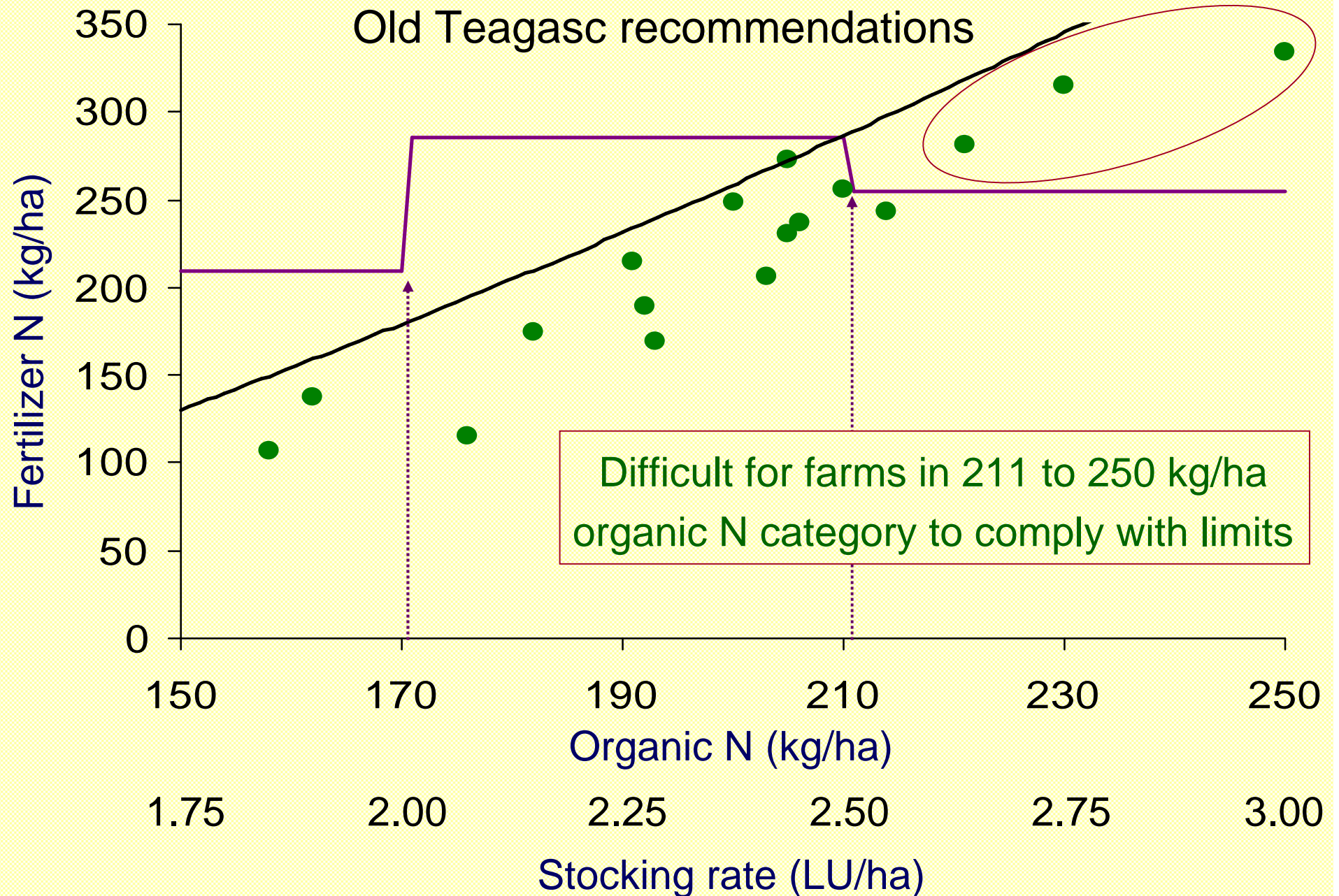


Organic N (kg/ha)	Stocking rate (LU/ha)	Fertilizer N (kg/ha)	Fertilizer N (units/acre)
≤ 170	≤ 2.00	208	169
171 – 210	2.0 – 2.5	284	230
211 – 250	2.5 – 3.0	253	205

dairy farms



Stocking rate (Organic N) and fertilizer N use of 17 dairy farms



Options for intensive farms (>211 kg/ha of organic N)

High milk output per cow ~ 500 kg milk solids per cow

1400 gals per cow; 3.55% protein & 4.10% butterfat

1350 gals per cow; 3.65% protein & 4.25% butterfat

Long lactation

Low replacement rate

70,000 gallons milk on 75 acres (30 ha)

Milk output	1,100 gals per cow 3.40% protein 3.90% butter fat	1,400 gals per cow 3.56% protein 4.21% butter fat
	Livestock No.	Organic N (kg)
Diary cows	66	5610
Replacements	14	1134
Organic N		6744
Organic N (kg/ha)		225
Annual Feed Requirements	(UFL)	(UFL)
Dairy cows (4325)	285,500	(5215) 255,500
Replacements	41,000	41,000
Total	326,500	296,500

70,000 gallons milk on 75 acres (30 ha)

	375 kg MS per cow		500 kg MS per cow	
Diary cows	66	5610	49	4165
Replacements	14	1134	14	1134
Organic N		6744		5299
Organic N (kg/ha)		225		177
Annual Feed Requirements (UFL)				(UFL)
Dairy cows				,500
Replacements				,000
Total				,500
Feed Requirements (DM)		330 t		300 t
30 ha farm		11.0 t/ha		10.0 t/ha
80% utilization		13.7 t/ha		12.5 t/ha
Fertilizer N allowance		253 kg/ha		284 kg/ha

Increasing milk solids production per cow
 is an important long-term objective

Options for intensive farms (>211 kg/ha of organic N)

High milk output per cow ~ 500 kg milk solids per cow

1400 gals per cow; 3.55% protein & 4.10% butterfat

1350 gals per cow; 3.65% protein & 4.25% butterfat

Long lactation

Low replacement rate

Keep less non-essential livestock & beef cattle

Rent land or buy in feed

White clover – on external blocks of land

82,000 gallons milk on 75 acres (30 ha)

Milk output 1,400 gals per cow
 3.56% protein
 4.21% butter fat

	Livestock No.	Organic N (kg)
Diary cows	57	4845
Replacements	16	1296
Organic N		6141
Organic N (kg/ha)		205
Annual Feed Requirements (UFL)		
Dairy cows (5215)		297,250
Replacements		46,750
Total		344,000

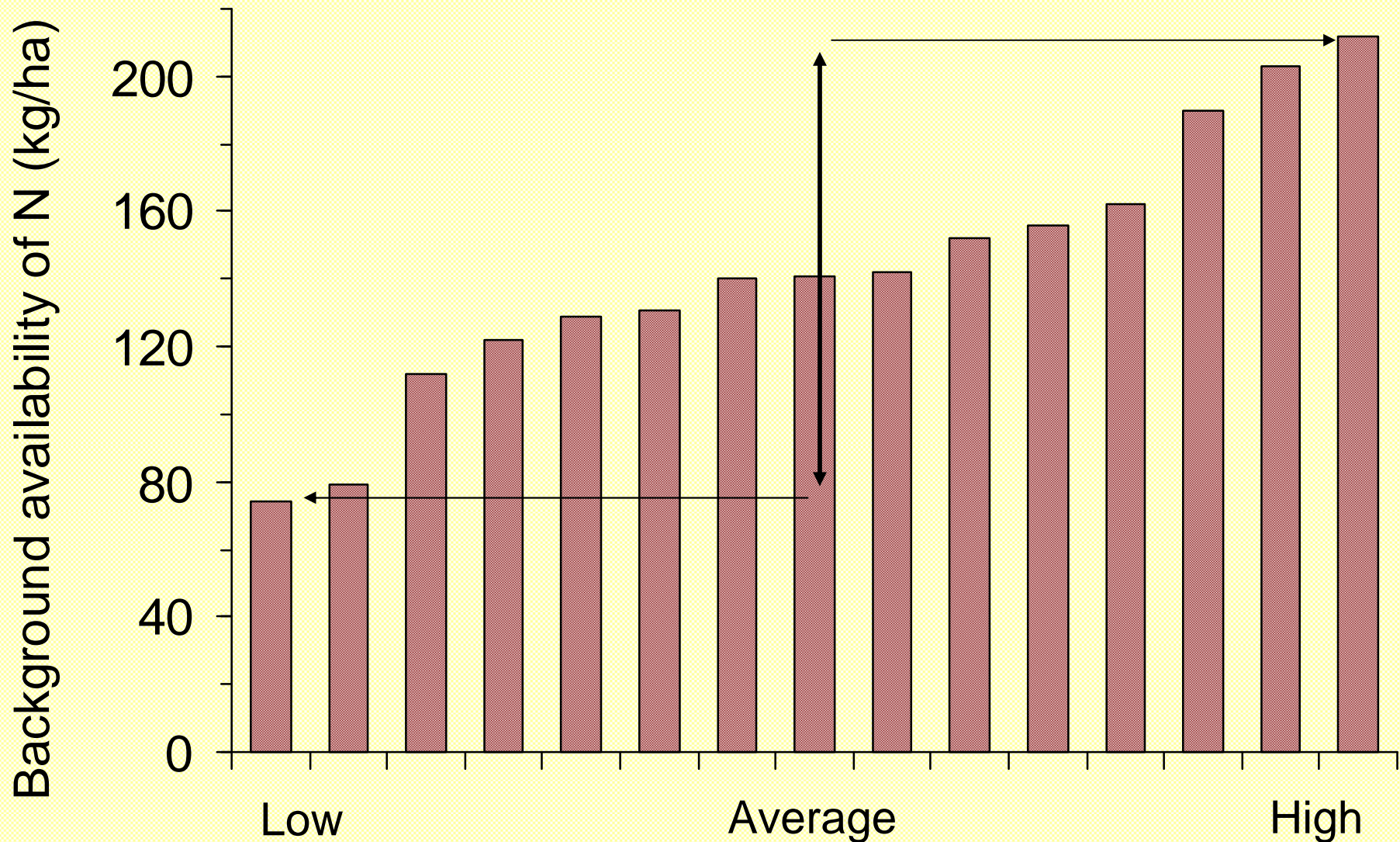
	ha	acre	kg/ha
Clover	5	13	75
Grass	25	62	325
Average fert. N			283

Factors Affecting Fertilizer N use on Farms



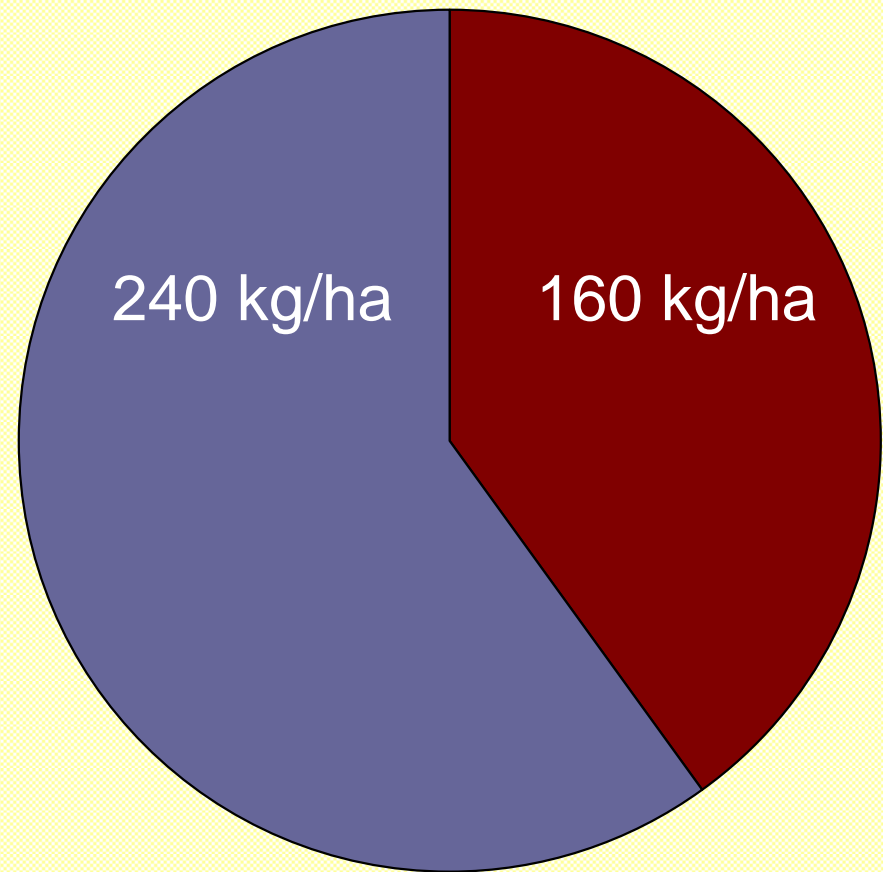
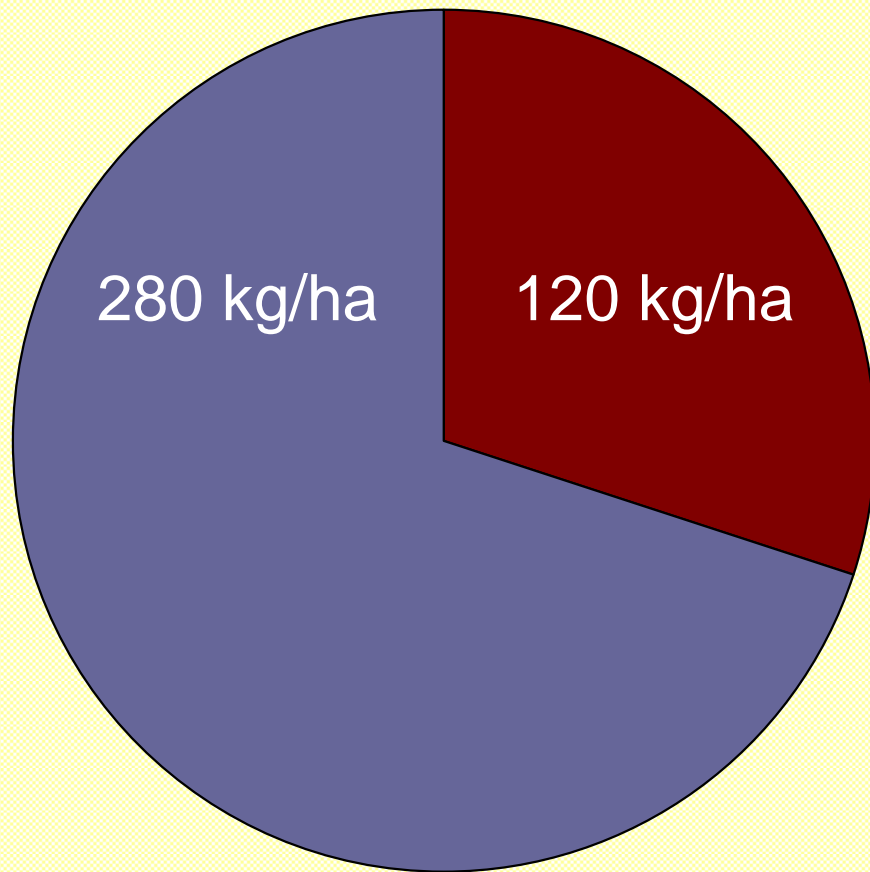
Factors affecting fertilizer N use on farms

Background soil N availability (kg/ha)



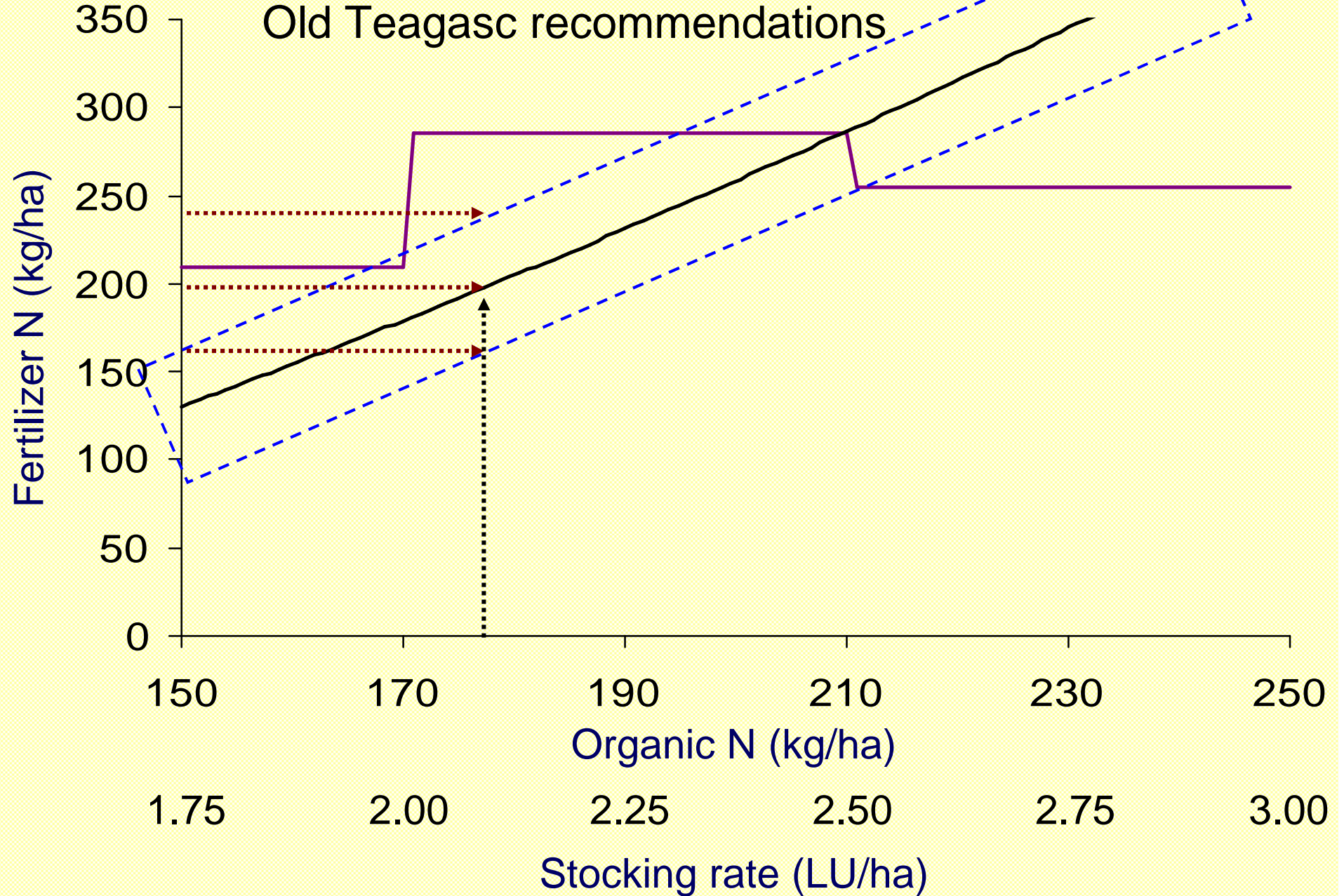
Factors affecting fertilizer N use on farms

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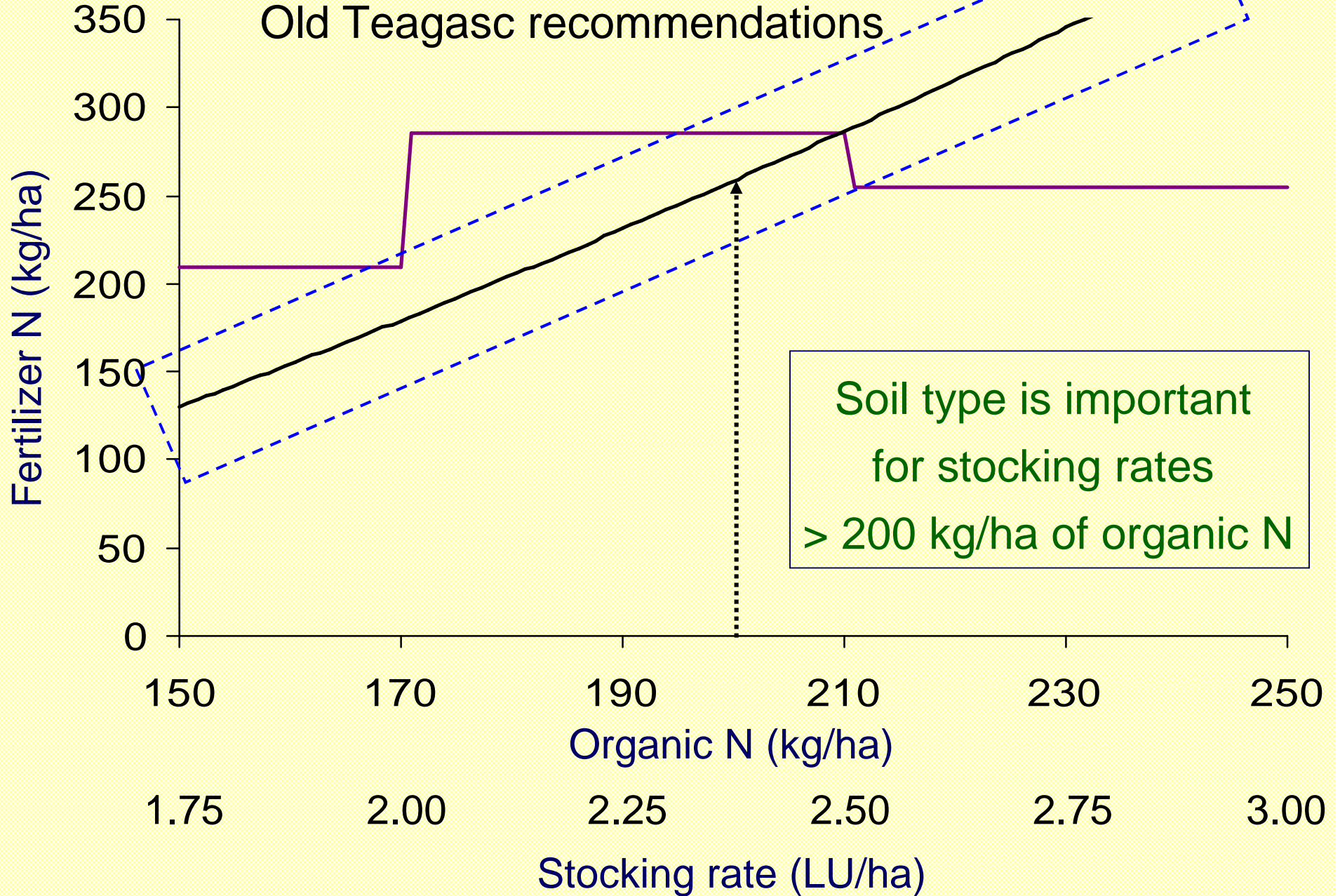
Stocking rate (Organic N) and fertilizer N allowance

Old Teagasc recommendations



Stocking rate (Organic N) and fertilizer N allowance

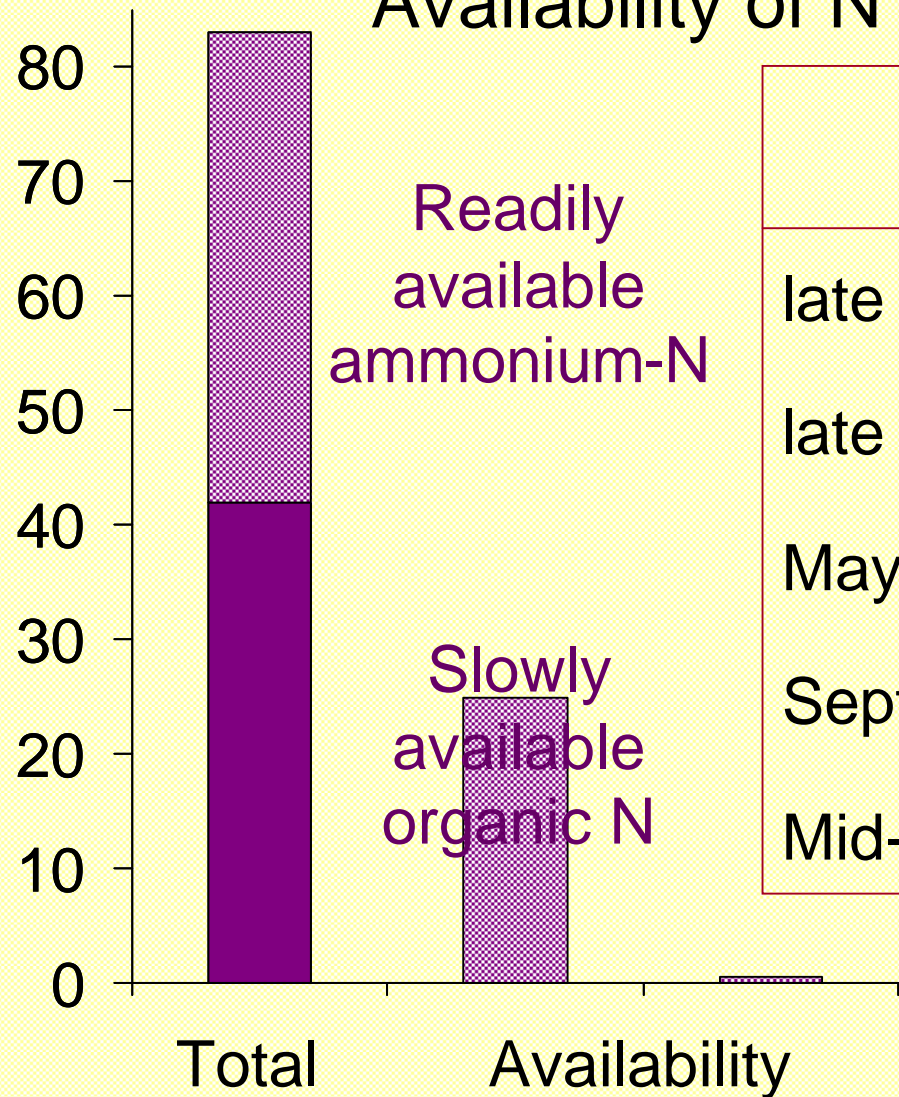
Old Teagasc recommendations





Factors affecting fertilizer N use on farms

Availability of N in slurry (kg/ha)



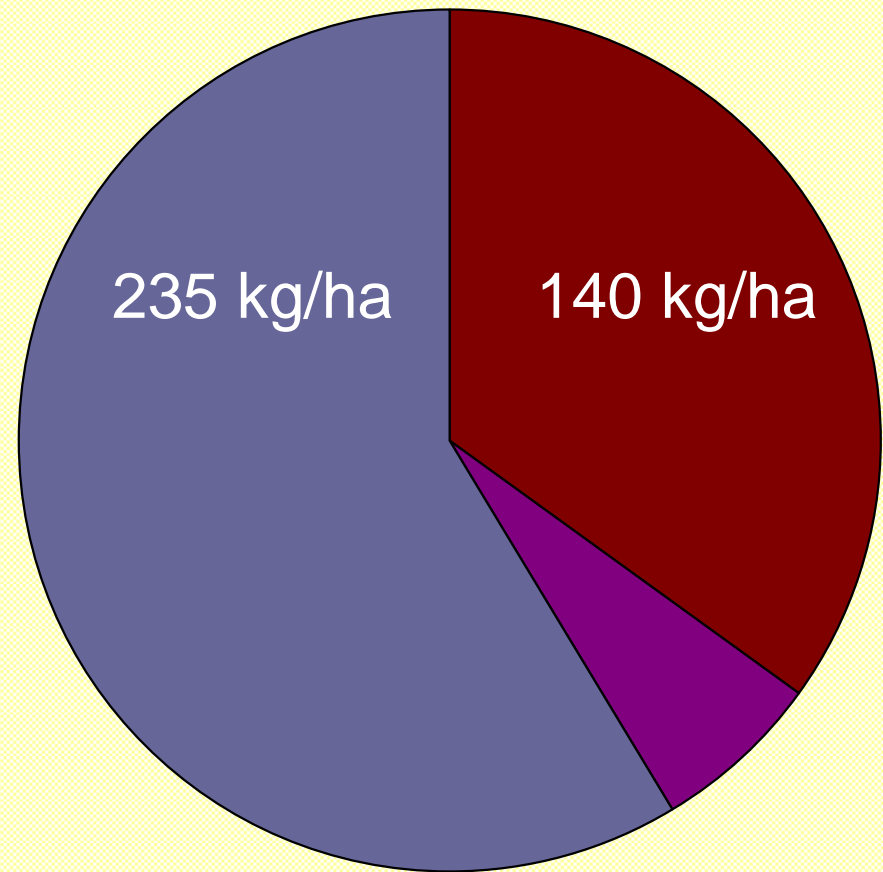
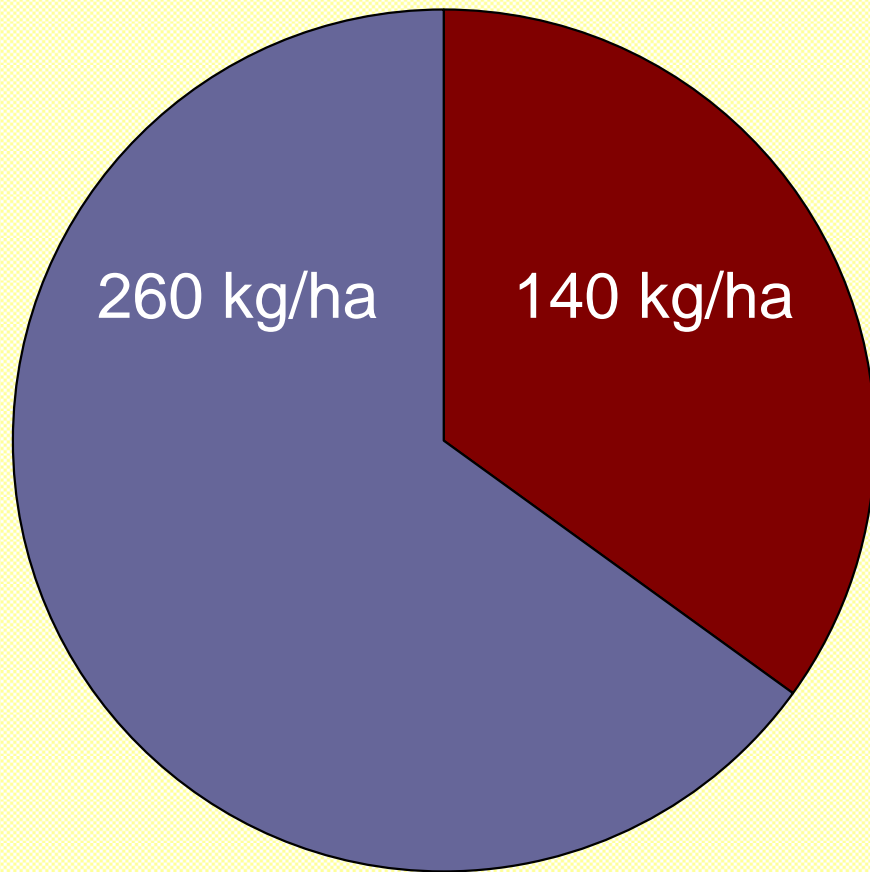
Availability of N in Slurry	
late January	5 – 25%
late March – 1 st cut silage	>25%
May/June – after 1 st silage	0 – 5%
September/October	25%
Mid-October to January	0 – 5%

Good

Poor

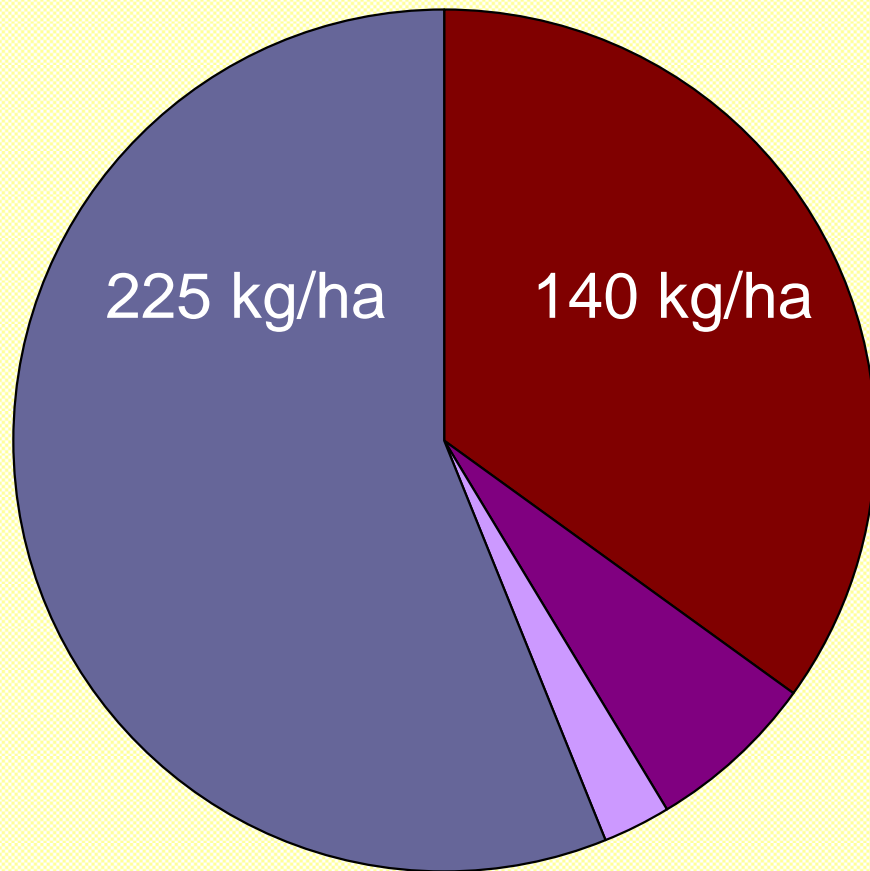
Factors affecting fertilizer N use on farms

Background soil N and slurry N (kg/ha)



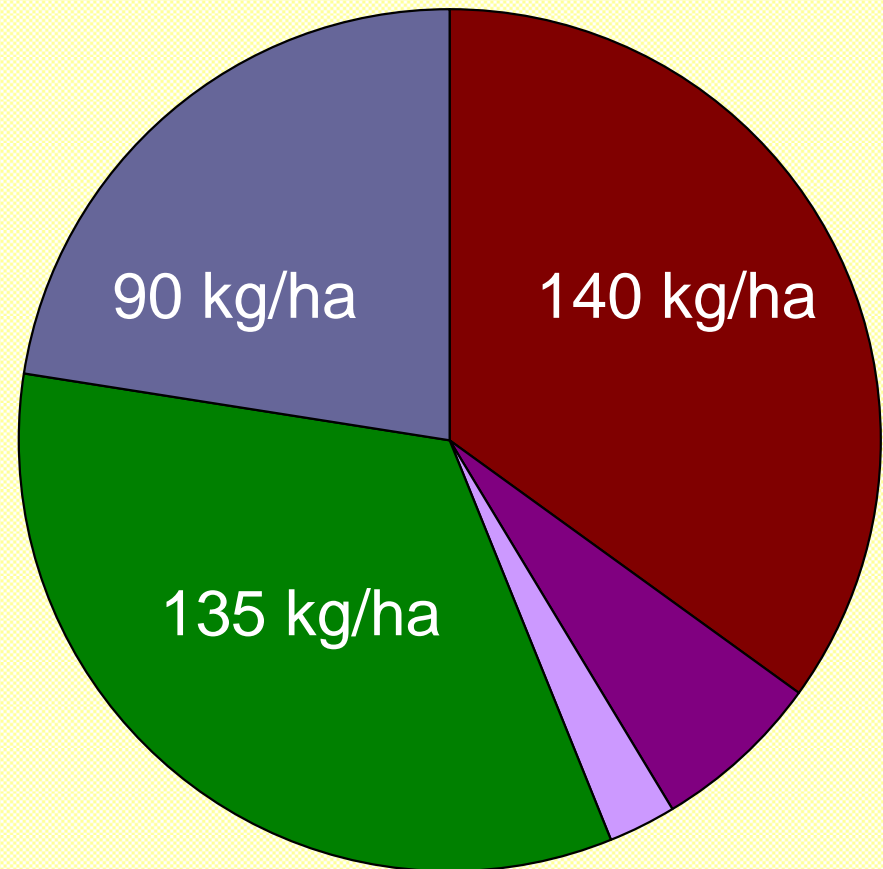
Factors affecting fertilizer N use on farms

Dirty water (kg/ha)



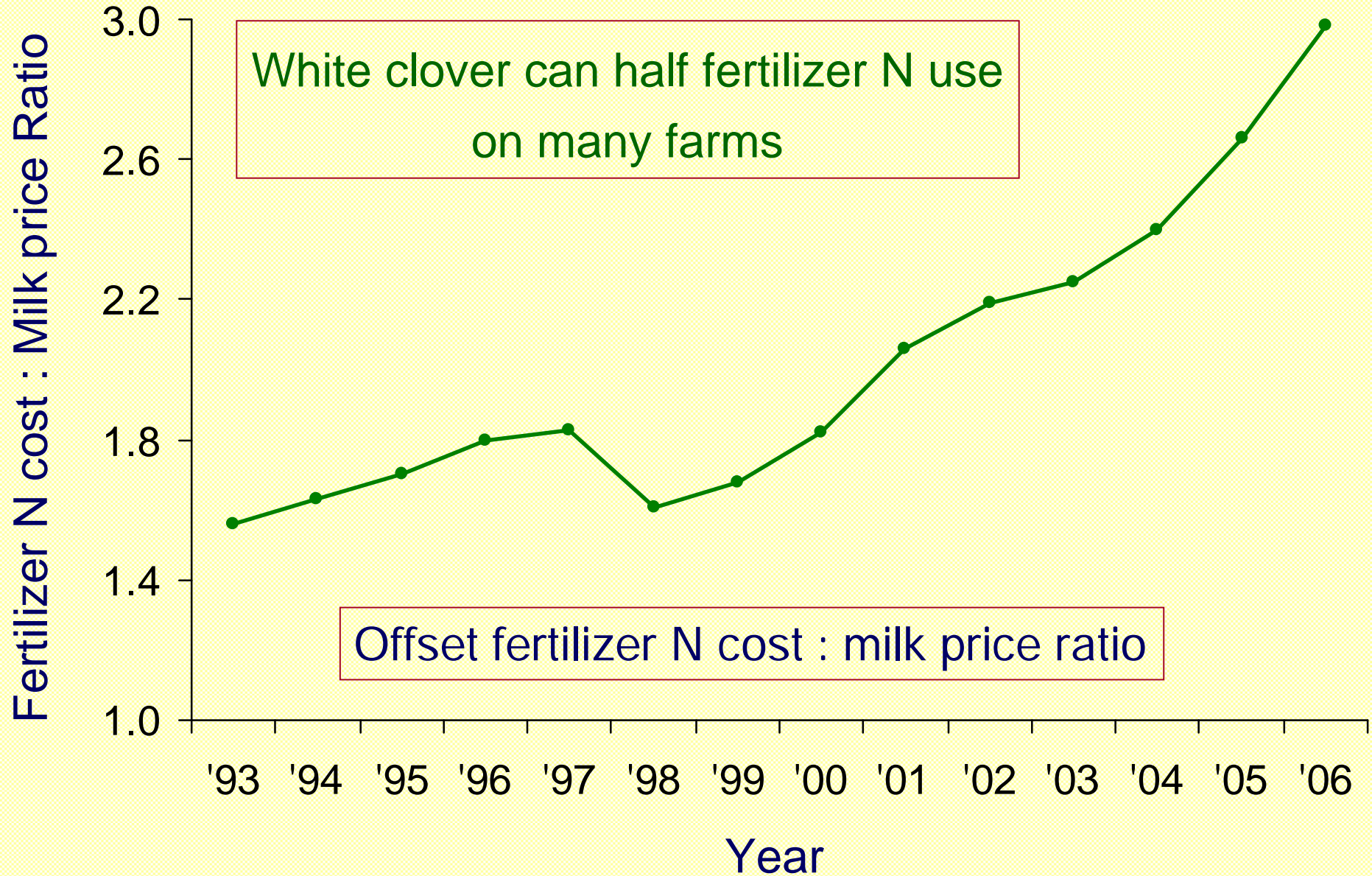
Solohead Farm = €1,020

White Clover (kg/ha)



Solohead Farm = €5,000

Fertilizer N cost : Milk price Ratio



Cutting back on fertilizer N use on farms



Cutting fertilizer N use by 25%

Cutting back on fertilizer N use – Fertilizer N

Apply 23 units per acre in January/February (SR > 170 kg/ha)

Follow up with more fertilizer N within 6 weeks – mid-March

Third application to coincide with closing for silage in April

Maximise stocking rate on grazing area during April to June

Make all or most silage as first-cut – minimise second-cut

Large area of farm available for grazing from June onwards

Start building covers during late July or early August

Last application during early September

Cutting back on fertilizer N use – Slurry

Replace fertilizer N in January by 2500 gals per acre of slurry

Apply six weeks before expected date of grazing

Replace fertilizer N for first-cut by 3000 gals before 1st April

Reduce fertilizer N from 92 units to 69 units per acre

Target 70% of slurry applied before mid-April

Target 100% of slurry applied before mid-June – tanks empty

Better response to dilute slurry after first-cut silage (+ dirty water)

Good response after long rotations in September – mid-October

Cutting back on fertilizer N use – White Clover

Large potential to cut fertilizer N use of farms – can be halved

Biological N fixation = 100 to 120 units N per acre per year

Recommended in conjunction with REPS – (SR <170 kg/ha)

Low fertilizer N input and tight grazing are important

Introduce clover by reseedling, over-sowing & management

Suits farms where a long grazing season can be achieved

Sensitive to shading over winter and poaching damage

Bloat & dock control are not unsolvable problems

Summary and Conclusions

Fertilizer N cost relative to milk price has almost doubled

Fertilizer N limits are not a problem for most grassland farms

Difficult to comply with regulations in category 211 – 250 kg/ha

High milk solids output per cow is an important objective

Others: keep less beef, rent land, import feed, white clover etc.

Attention to detail when applying fertilizer N – have a plan

Aim to get 70% of slurry applied during the spring

White clover offers greatest opportunity to cut fertilizer N costs