Increasing Profitability – Nitrogen Use Efficiency (NUE)

Peter Grace

Institute for Future Environments
QUT

NITROGEN FACTS
(2016 Growers Survey)

- 275 kg N/ha applied irrigated – up 13% since 2013
- 65% of N applied pre-season
- $500/ha spent on N fertiliser
- Most growers believe 50-70% of fertiliser N is taken up

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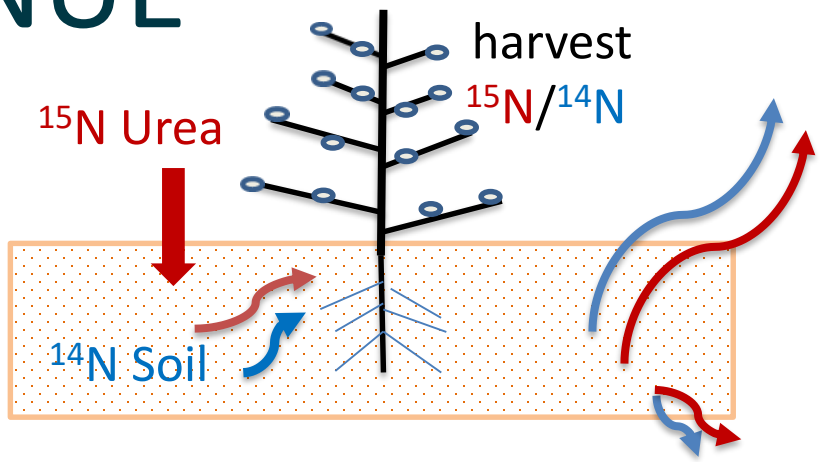
ASSESSING FERTILISER NUE



- ^{15}N tracer experiments
- 28 treatments across 4 farms (Darling Downs)
- Zero N, Farmer's Practice (FP), 70% FP, DMPP, Polymer
- Applied 88 - 200 kg N/ha (average = 130 kg N/ha)

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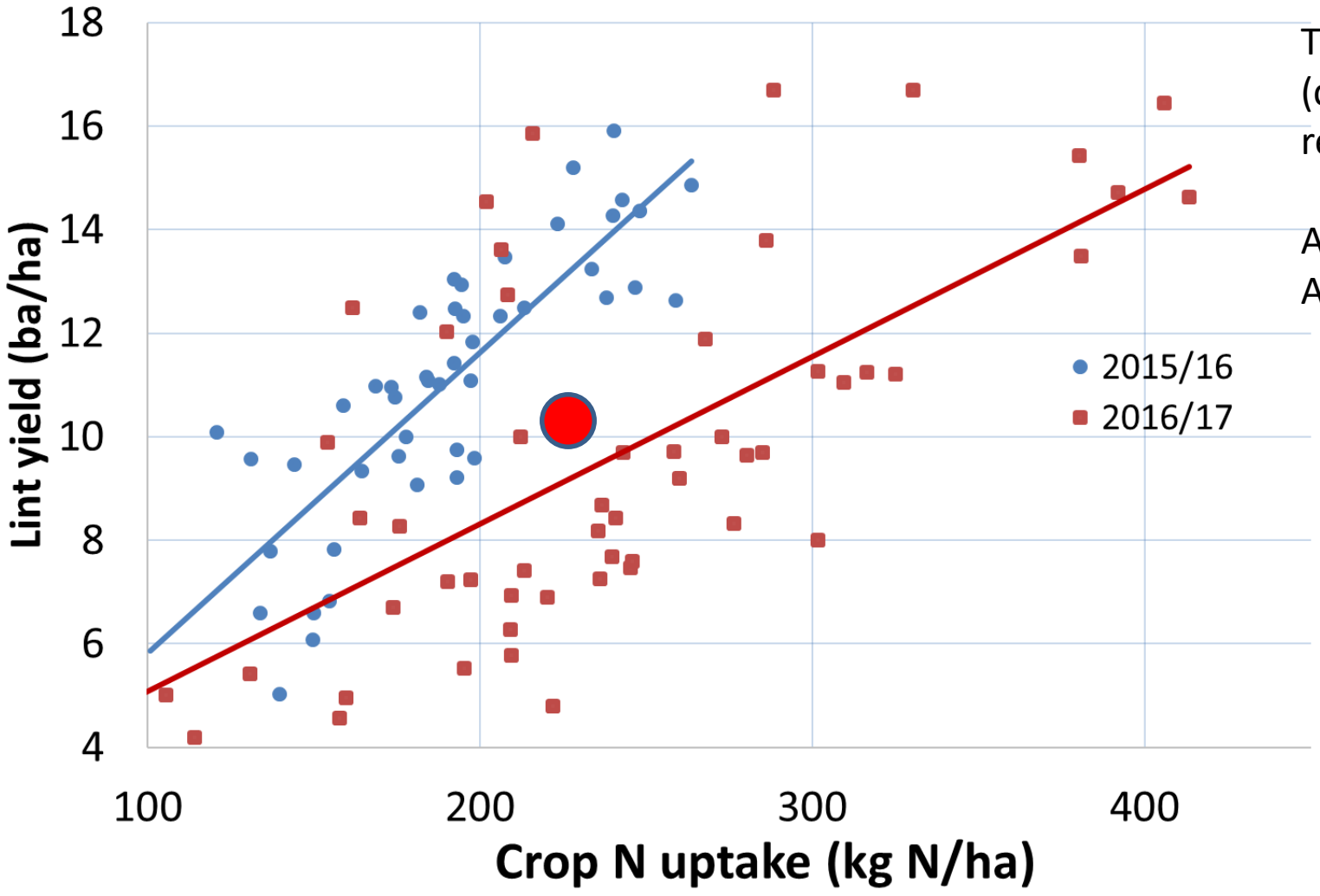
YIELD vs CROP N UPTAKE

Every Year is Different!



Two different years (climatically) provided realistic on-farm data

Average yield 10.3 ba/ha
Average N uptake 225 kg/ha

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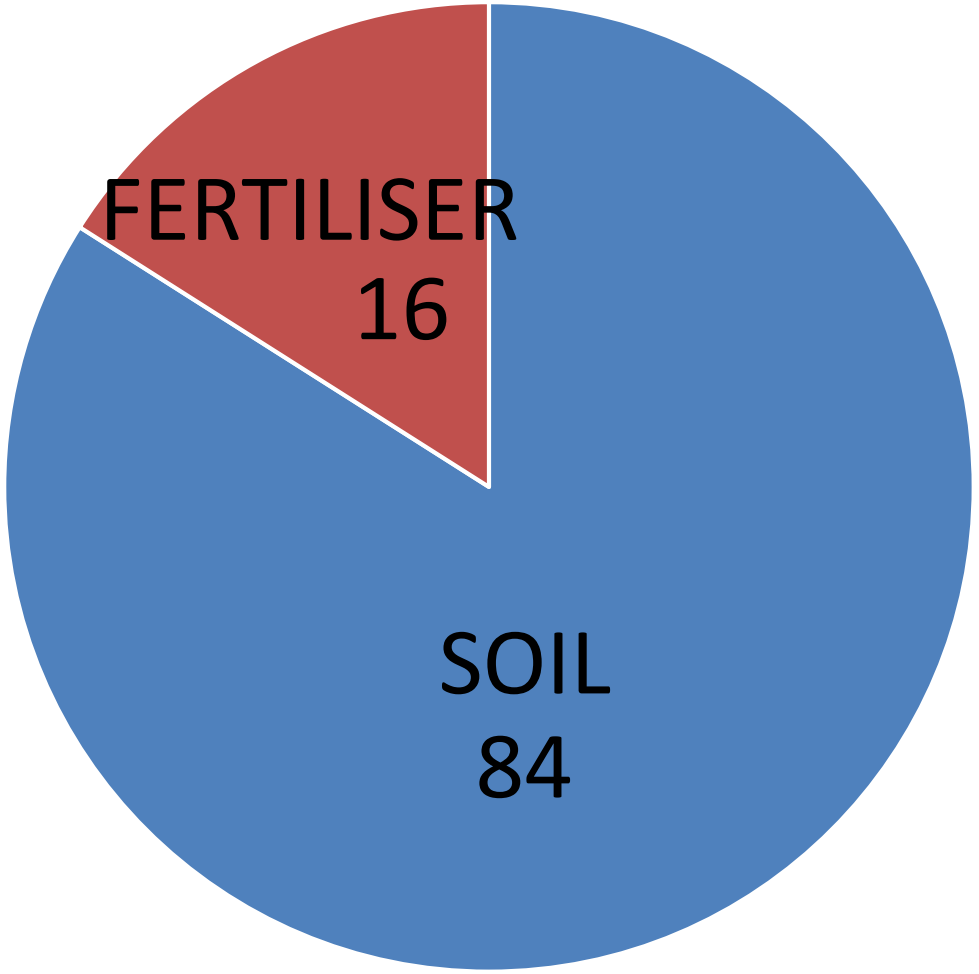
SOURCE of CROP NITROGEN

(% of plant N)



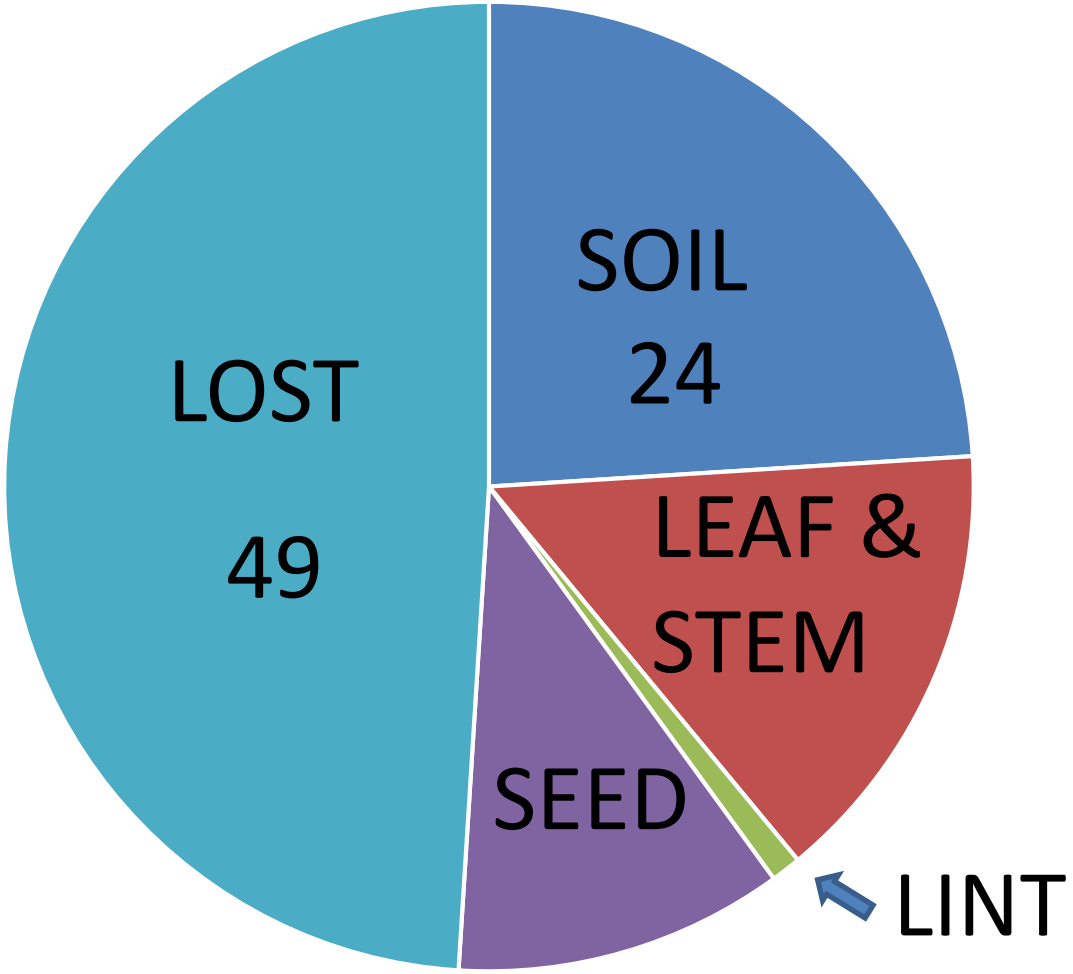
On average 84% of plant N was from the soil.

But the initial soil N (at the start of season) was 150 kg N/ha plus another 170 kg N/ha mineralised* during the season

*3% of total organic N in profile

FATE of NITROGEN FERTILISER

(% of applied N)



Applied	**200**
Lost	100
Seed	20
Leaf/Stem	30
Soil	50

Yield = H_2O x N x Management

- Waterlogged soil = gaseous nitrogen losses

- Nitrogen losses are dependent on
- the duration of waterlogging
- how much nitrogen is readily available

- Apply nitrogen when the crop needs it

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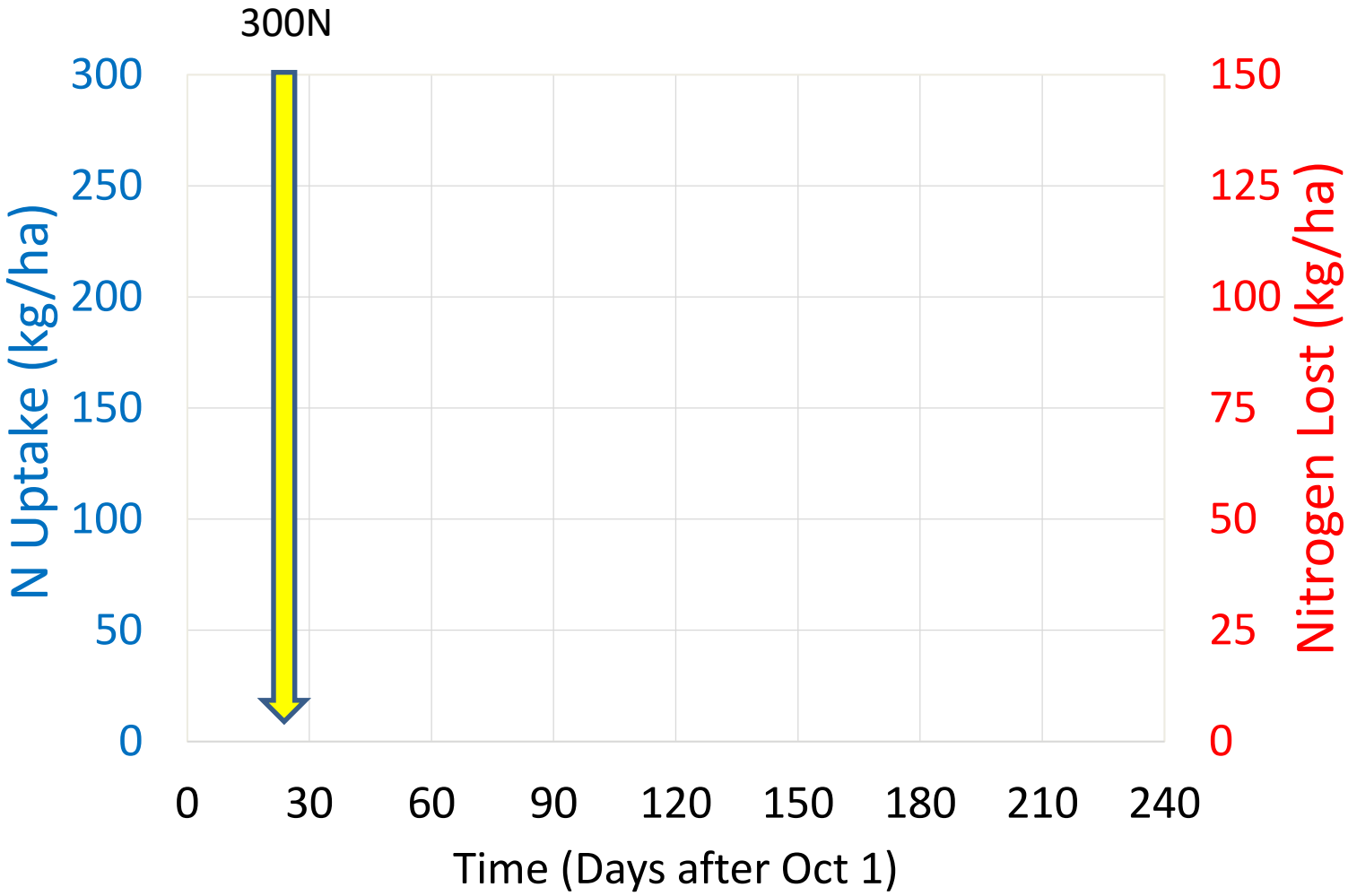
NITROGEN UPTAKE vs LOST

All upfront

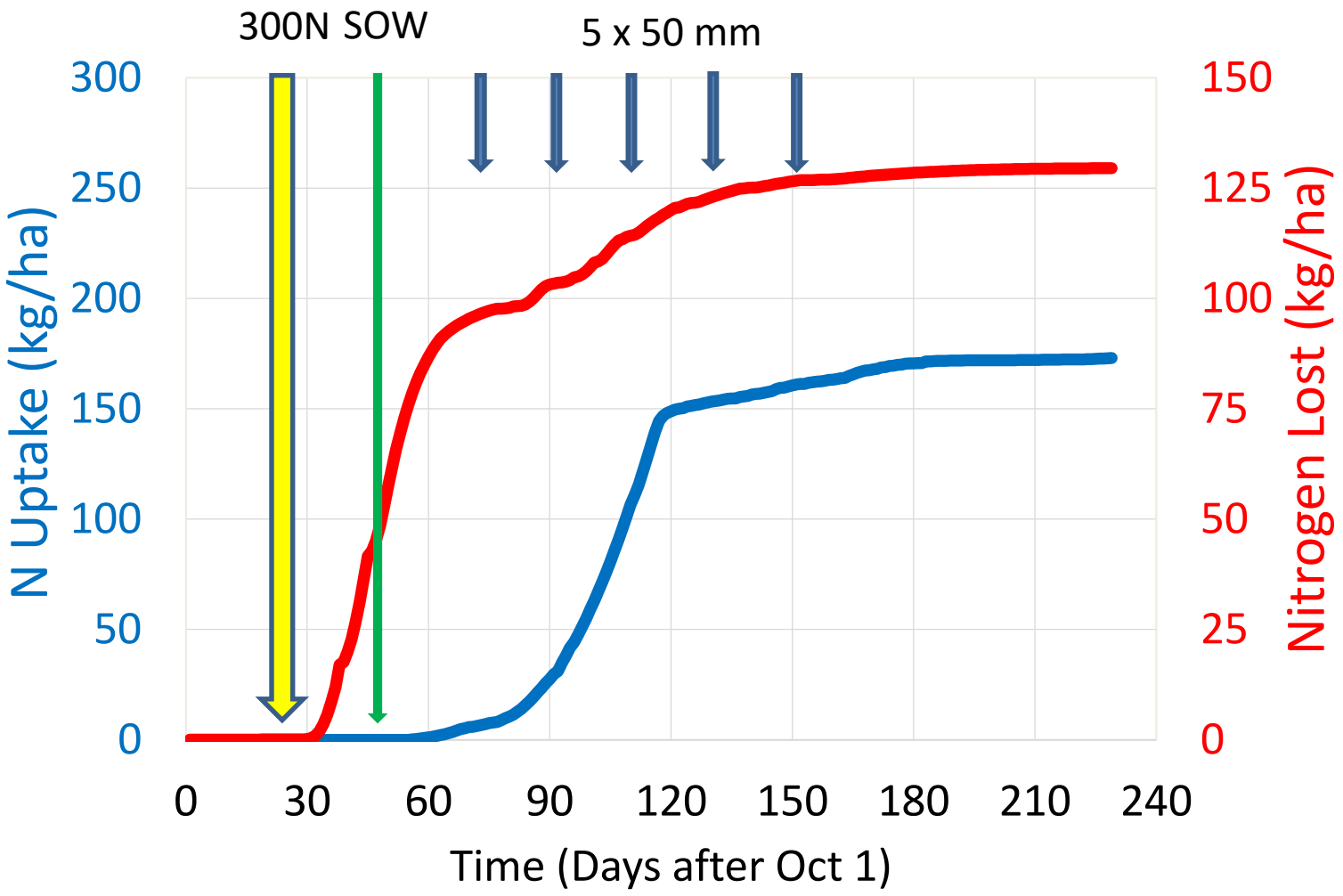


Initial min N = 50 kg/ha in profile

NITROGEN UPTAKE vs LOST

All upfront scenario

Initial min N = 50 kg/ha in profile



7.9 bales/ha

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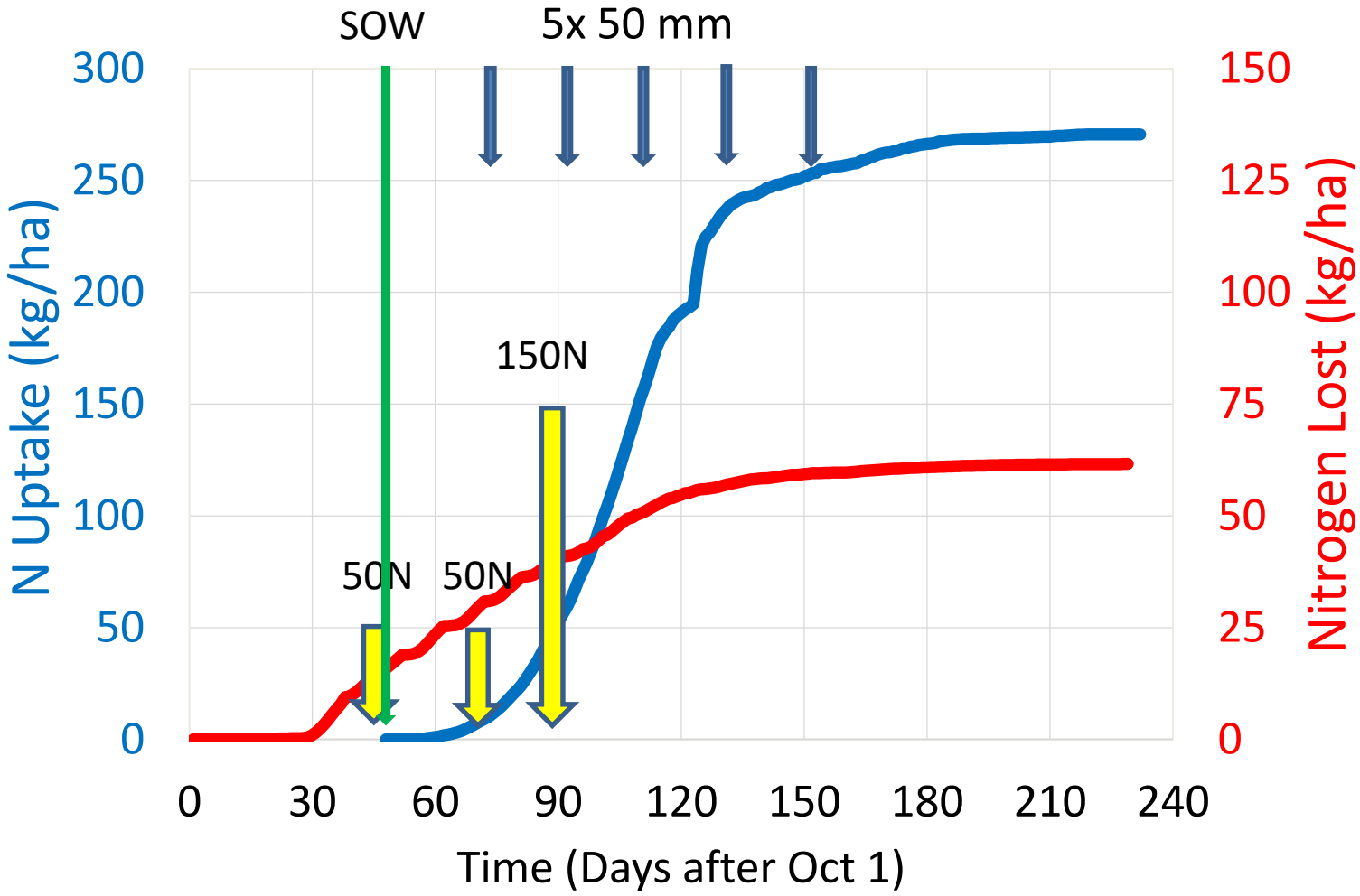
NITROGEN UPTAKE vs LOST

Split applications scenario

Initial min N = 50 kg/ha in profile



10.3 bales/ha

How do I increase NUE?

- Soil testing
- Nitrogen budgeting
- Apply N later with less H_2O more often
- Decision support tools