Pros and cons of grass buffer strips on Swedish arable land

Field trial in 2011-2019

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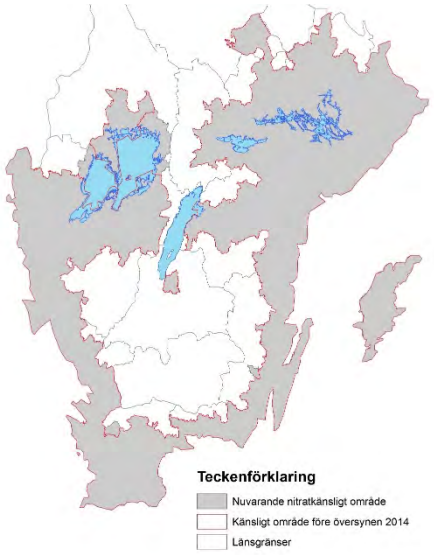
- Nutrient leaching from agriculture is one of the causes for eutrophication of the Baltic Sea. Farmers use g**rassed buffer strips** to reduce leaching
- Government has been subsidising to cover yields losses for the area.

Photo Ararso Etana

Photo Fredrik Widemo

- Nutrient loading on waters is prevalent from central to south
- The pollution comes also from other Baltic states



Aim of the field trial:

- To quantify the effect of grass buffer strips
- To test if removing vegetation can reduce nutrient accumulation in the buffer zone.

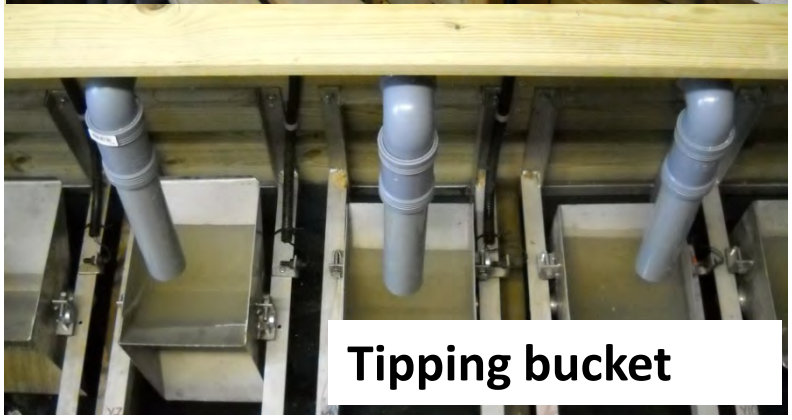
Trial field in Uppsala

- Caly content 32 %
- Well drained
- High P-content
- Slope -2%

Construction of drainage system & sampling station

We measured:

- Soil loss
- Phosphorus
- Nitrogen



Treatments:

A. tilled soil

B. Grass ley

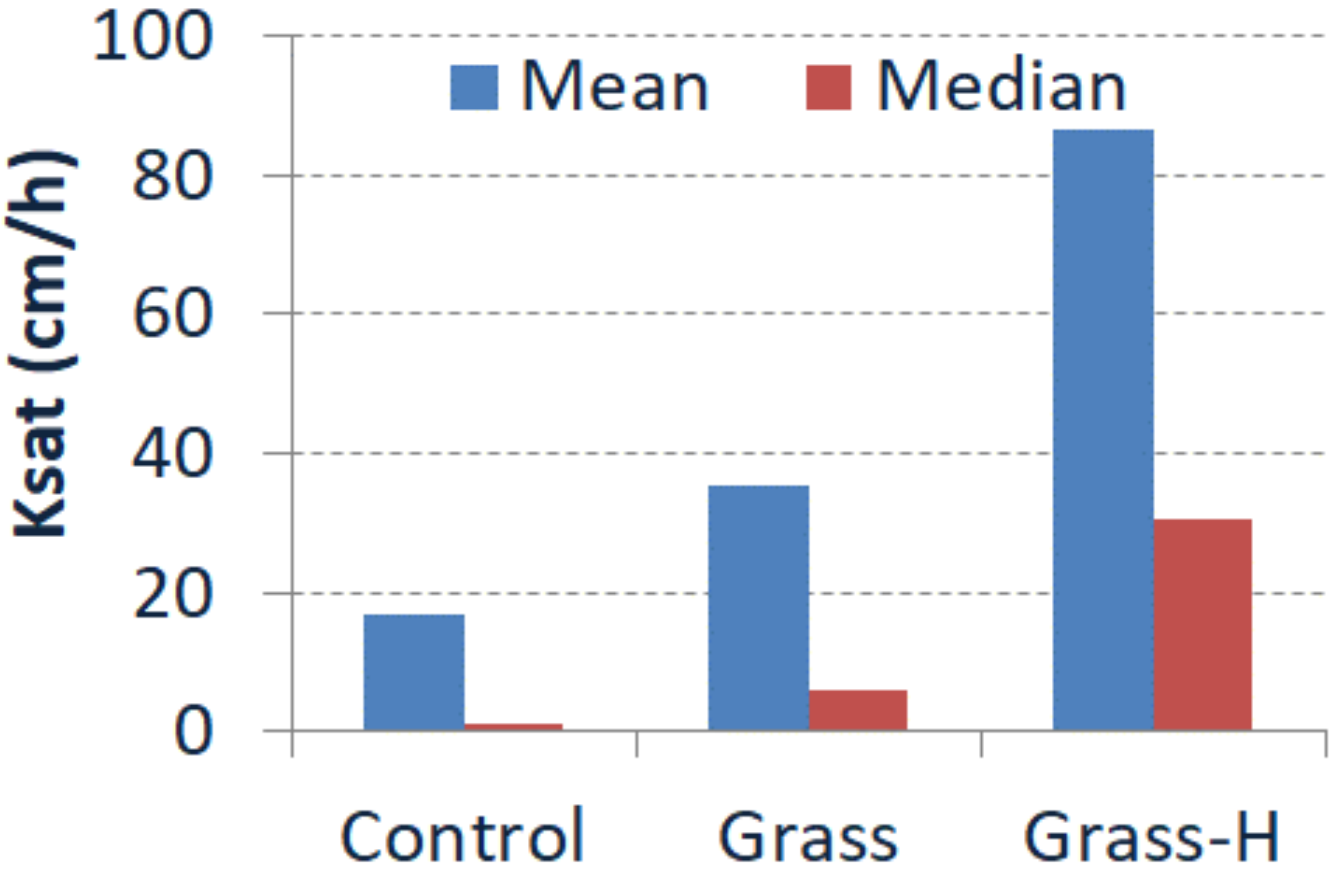
C. Grass ley , harvested once/yr

Snow melting in spring

Photo Ararso Etana

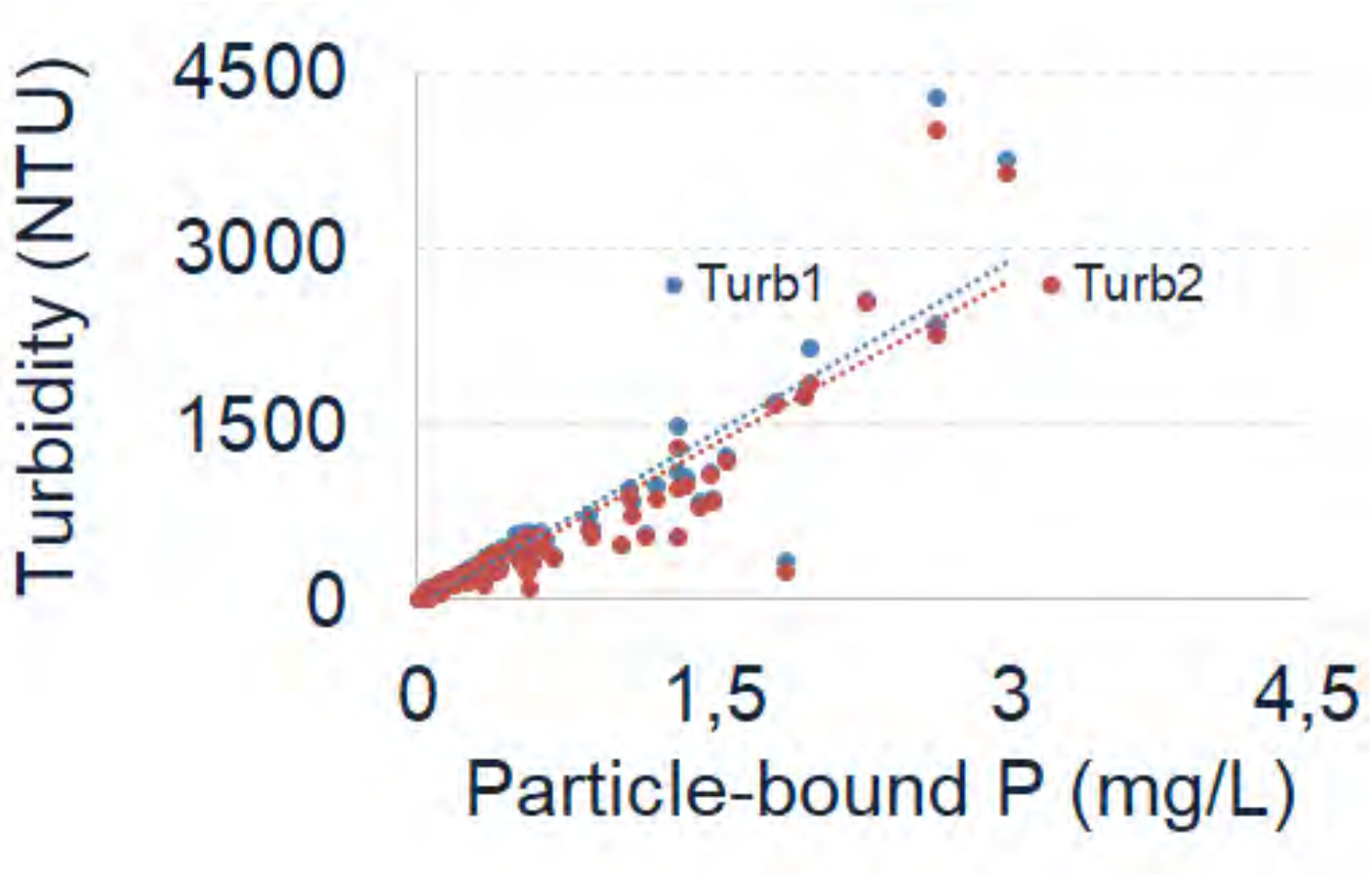
Measuring & sampling

Saturated hydraulic conductivity

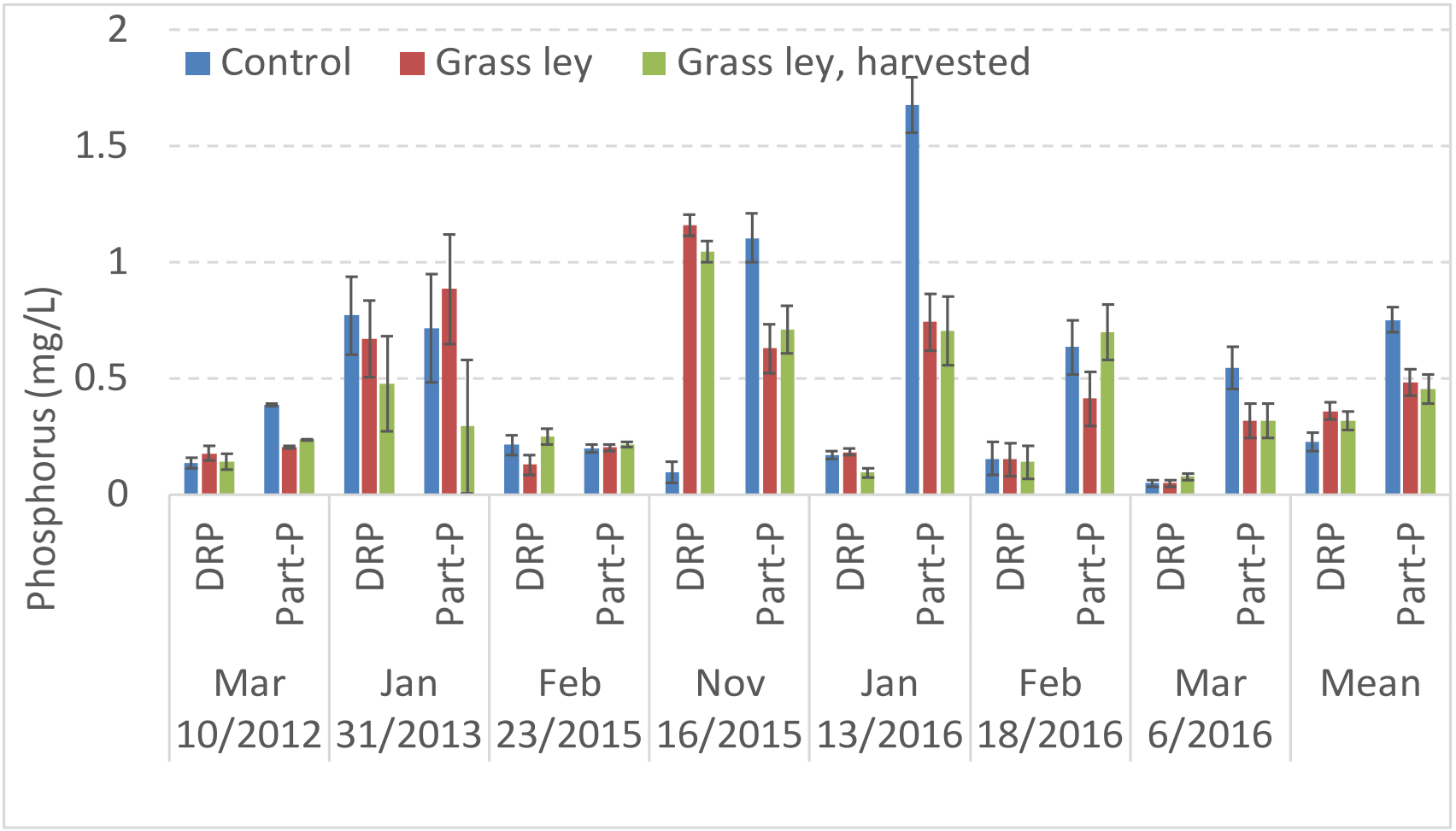


Saturated hydraulic conductivity (Ksat).

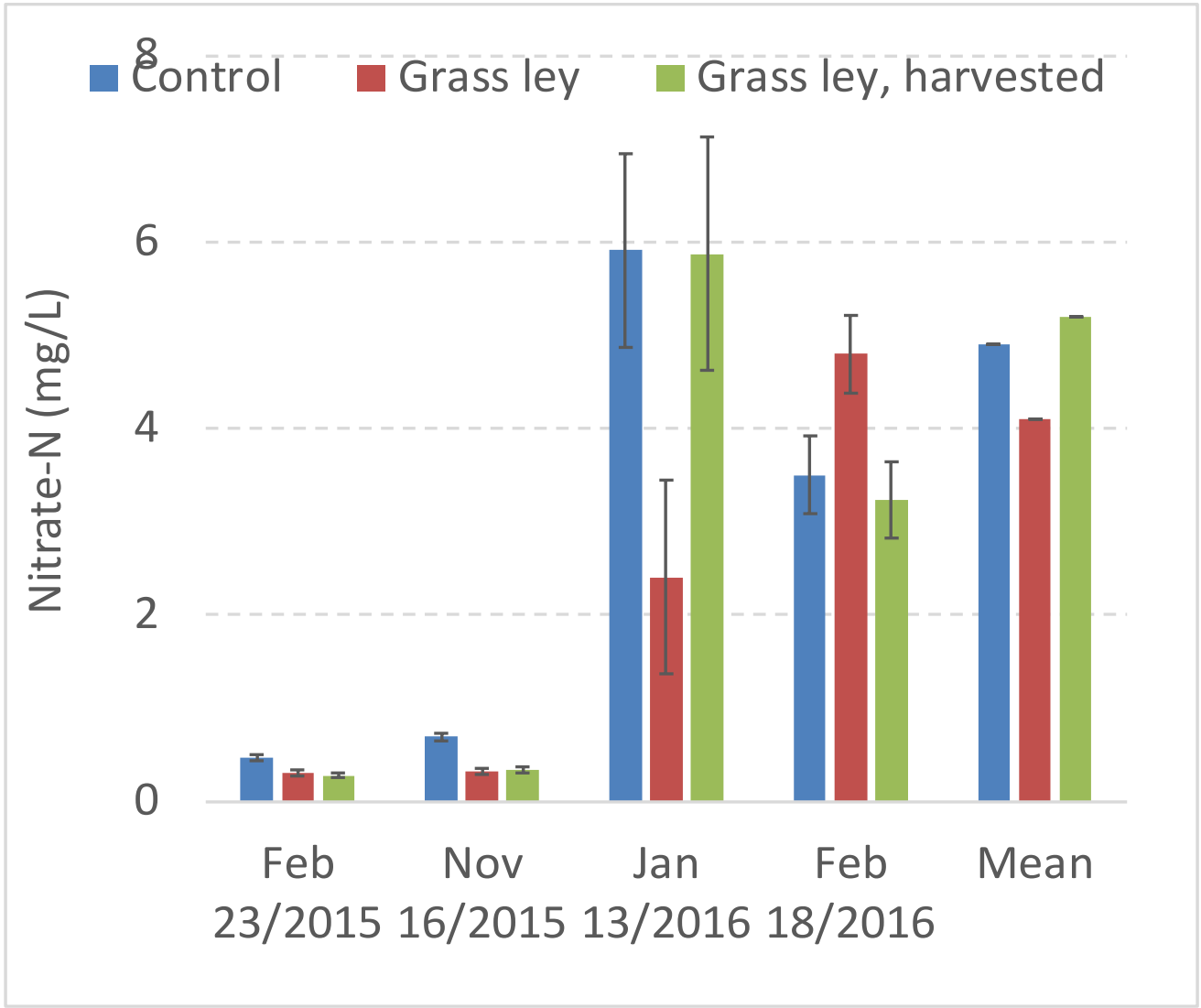
Turbidity


Turbidity (NTU)
4500
3000
1500
0
Turb1
Turb2
0
1,5
3
4,5
Particle-bound P (mg/L)

Results from surface runoff



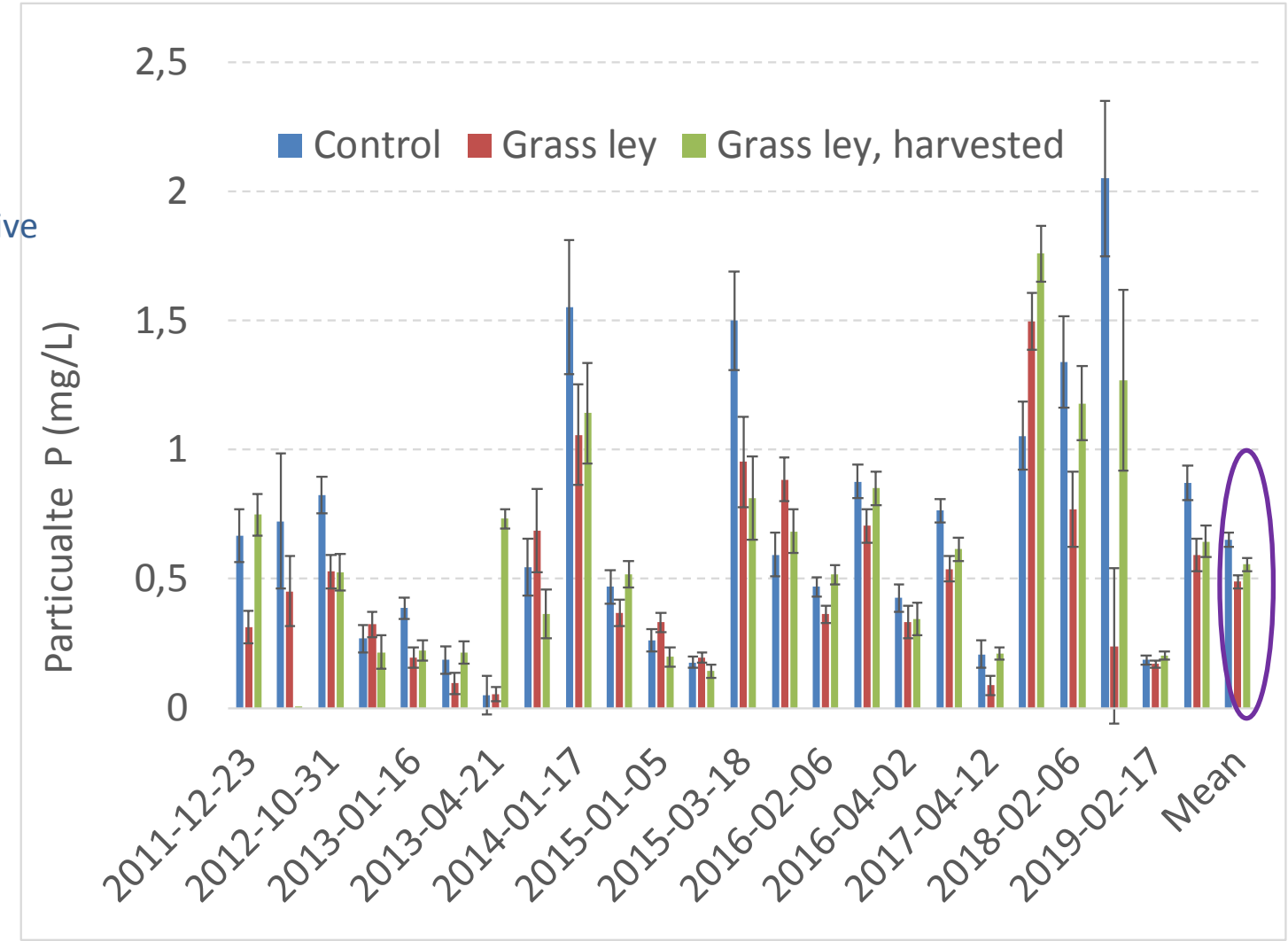
Results from surface runoff



Results from drainage

Particulate P

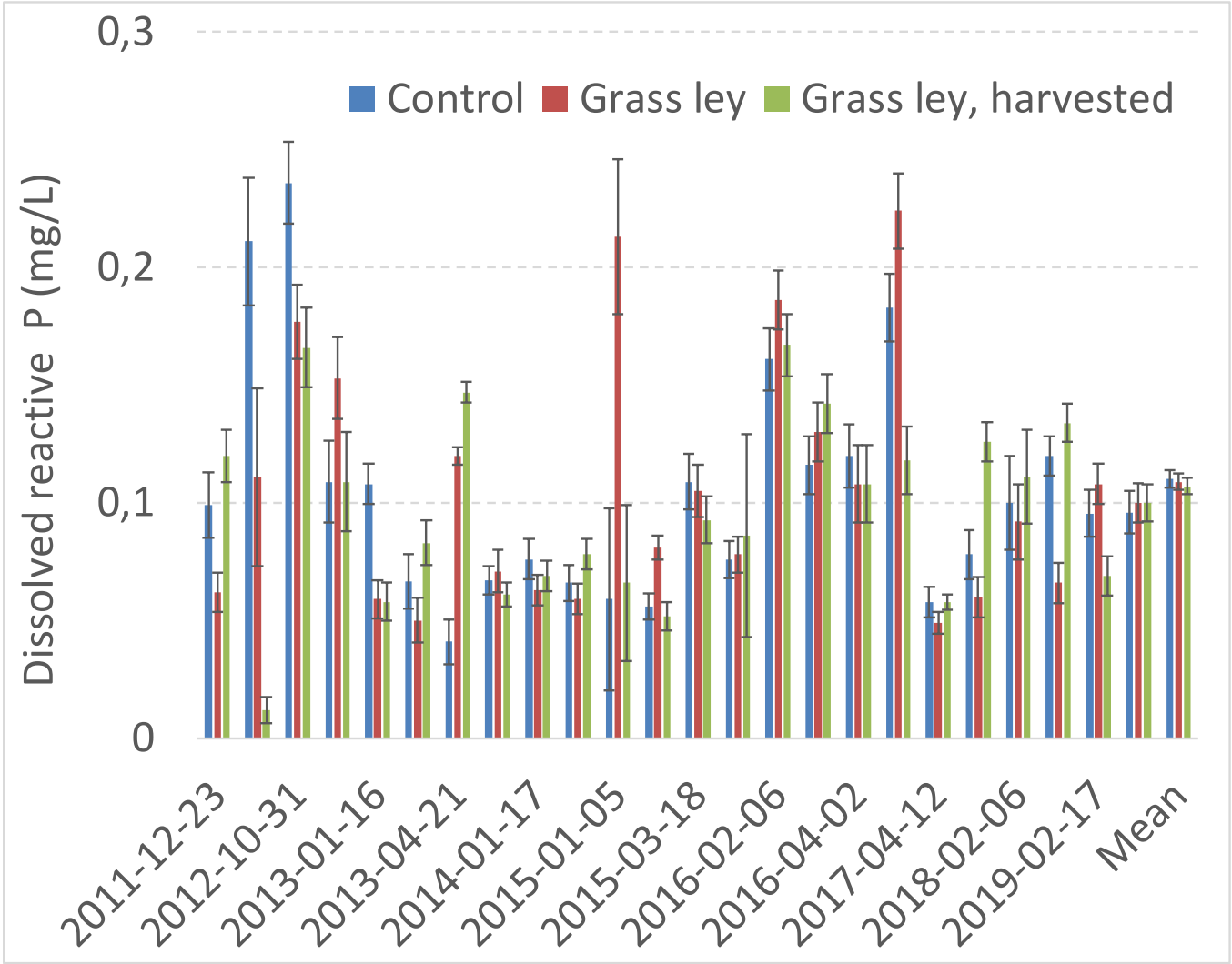
- Grass reduced PP
- Removing –less effective



Results from drainage

Dissolved reactive P

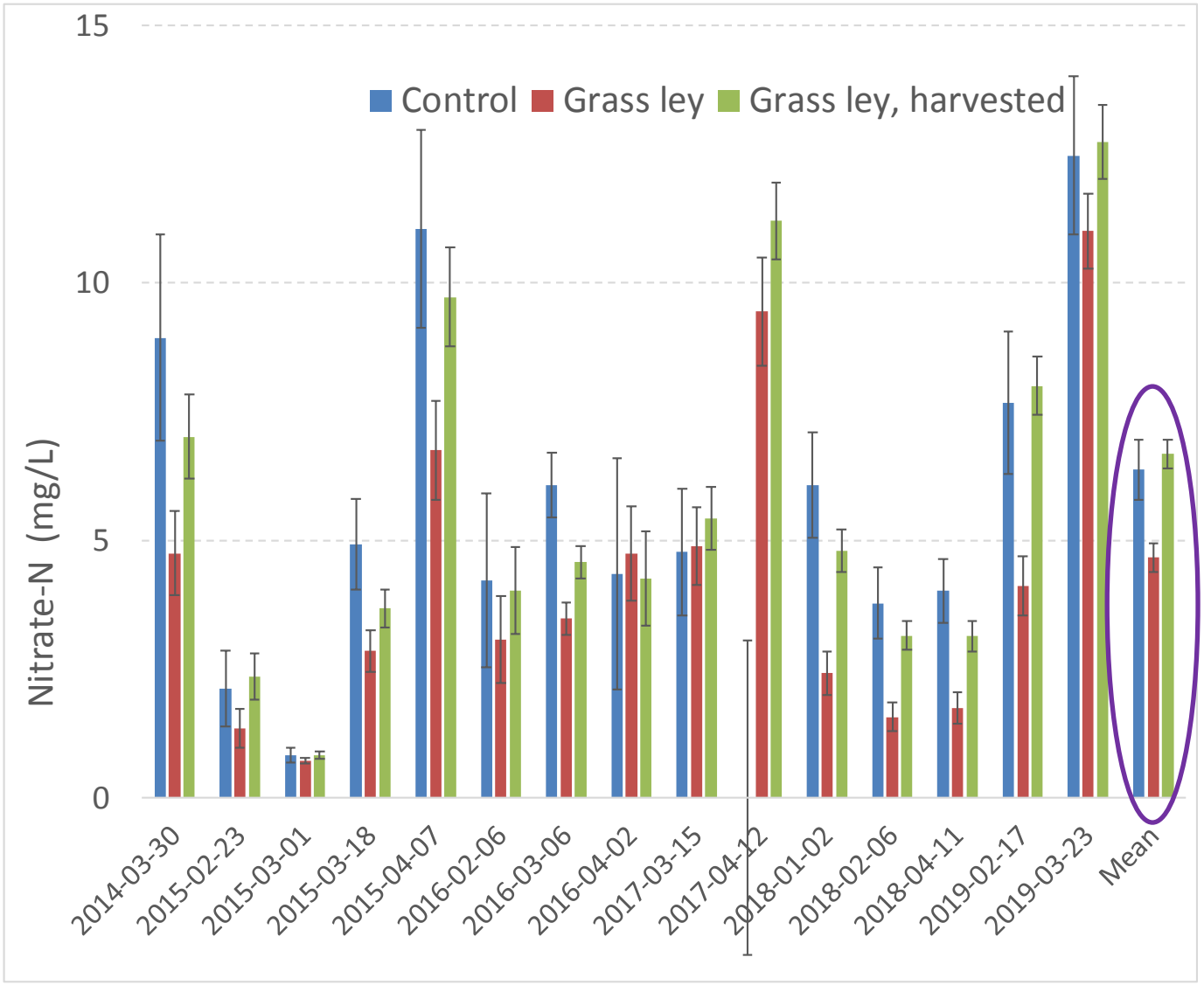
- Grass may increase DRP
- Removing did not help



Results from drainage

Nitrogen

- Similar trend
- Grass reduced leaching
- Removing did not!



Grass was ineffective due to

- Lodging of grass
- More subsurface leaching than runoff

Photo Araro Etana

Conclusion

- Grass reduced leaching of N & particle bound P
- Removing grass was less effective in reducing particle bound P

- Removing grass slightly increased N leaching.
- Grass may increase DRP
- Grass buffer strips are not reliable measure for reducing eutrophication

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Thank you for your attention