Joint session SLU Sweden – UH Finland

AP Helsinki
60°N

AP Skåne
55° N

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AP Helsinki

Patoniitty field

- Representative of the **acid sulphate soils** common in the coasts of Finland.
- **Silty clay loam**, approx. 33 % clay, 63 % silt and 4 % sand, and 3.8 % organic C
- Field history: grasses (1996-2001), rapeseed (2002) and cereals (2003 onwards).
- Low elevation (**field at sea level**); pumped drainage during the growing season, water table rising to the soil surface or above during off-season.

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STICS QuickScan

- We have used the worst case scenario suggested by IPCC[1] for the simulations (RCP 8.5).

Period	2006-2020	2021-2050	2051-2070	2071-2100
Temperature (°C)	4.88 ± 0.82	5.85 ± 0.94	7.32 ± 0.69	8.15 ± 0.91
Rainfall (mm)	895 ± 189	934 ± 118	928 ± 120	922 ± 129
CO2 (ppm)	398 ± 12	474 ± 37	609 ± 41	808 ± 77

Period	2006-2020	2021-2050	2051-2070	2071-2100
N days/year with max temperature > 20°C	15	23	32	53
N days/year with min temperature < -5°C	72	57	36	31
N days/year with precipitation > 20 mm	6	6	6	8

[1] Intergovernmental Panel on Climate Change

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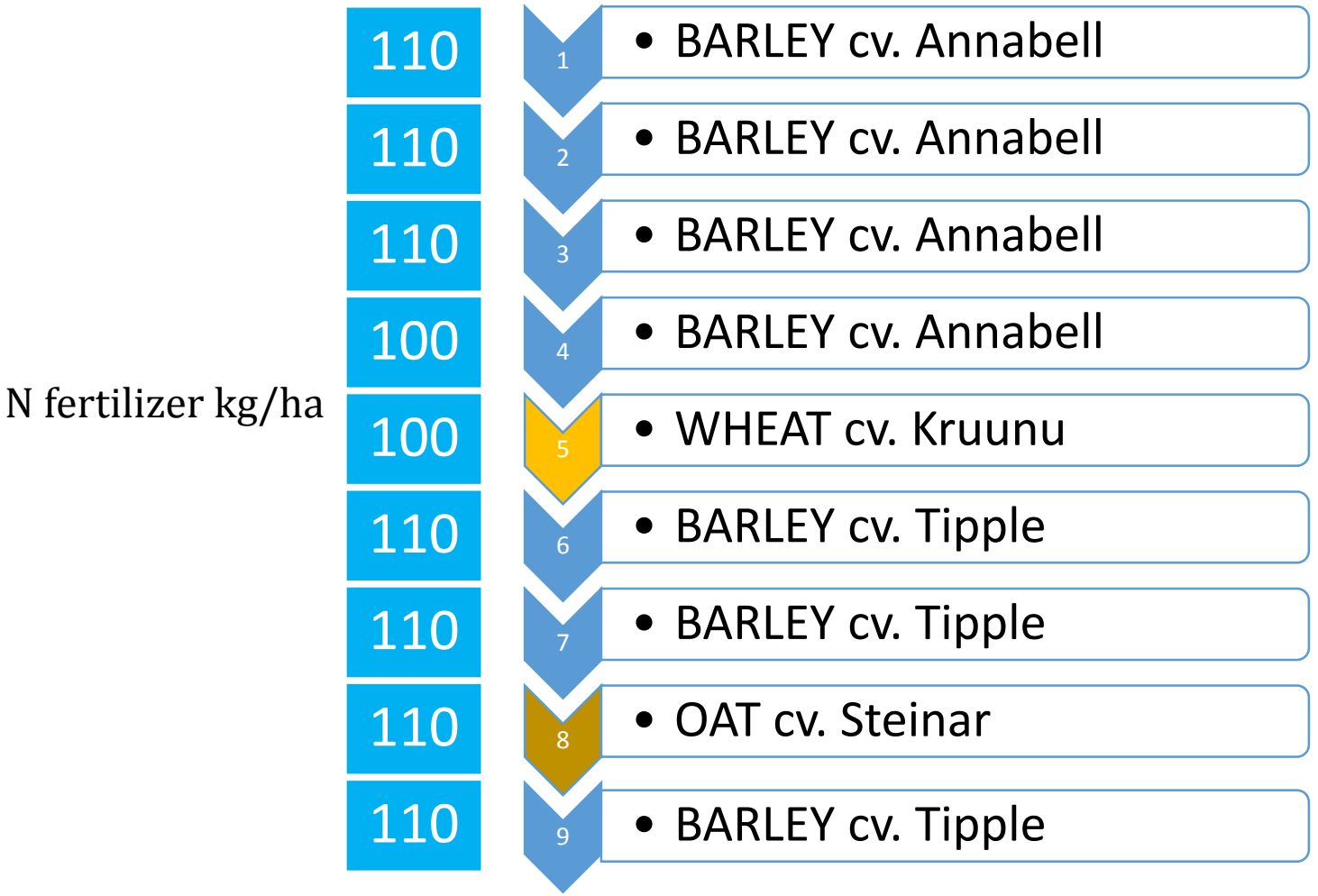
Reference system AP Helsinki



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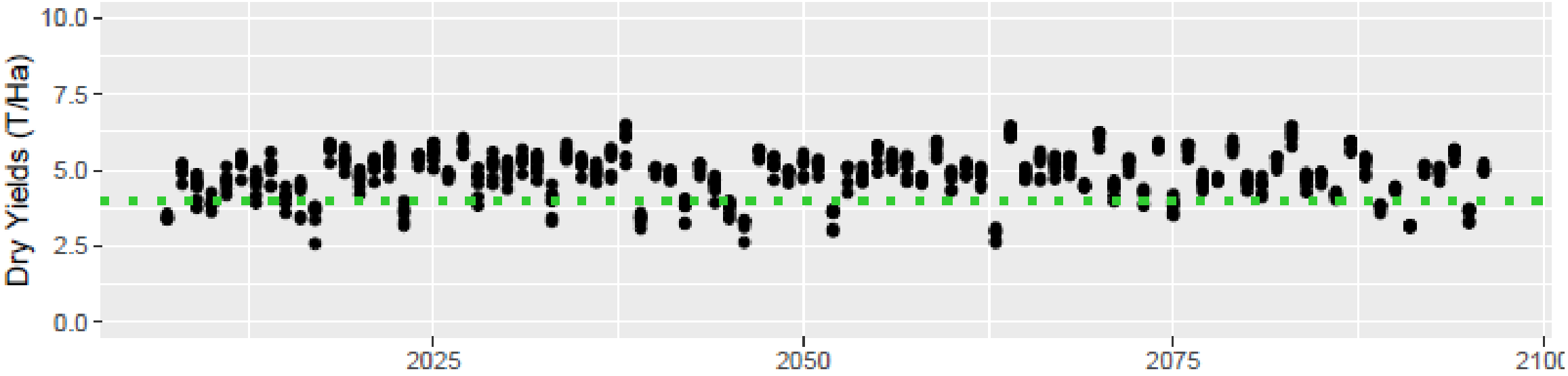
Spring barley



- No change in yields
- Higher amount of nitrate leaching over time; from 11 to 20 kg/ha
- Increase in N mineralization; from 50 to 93 kg/ha

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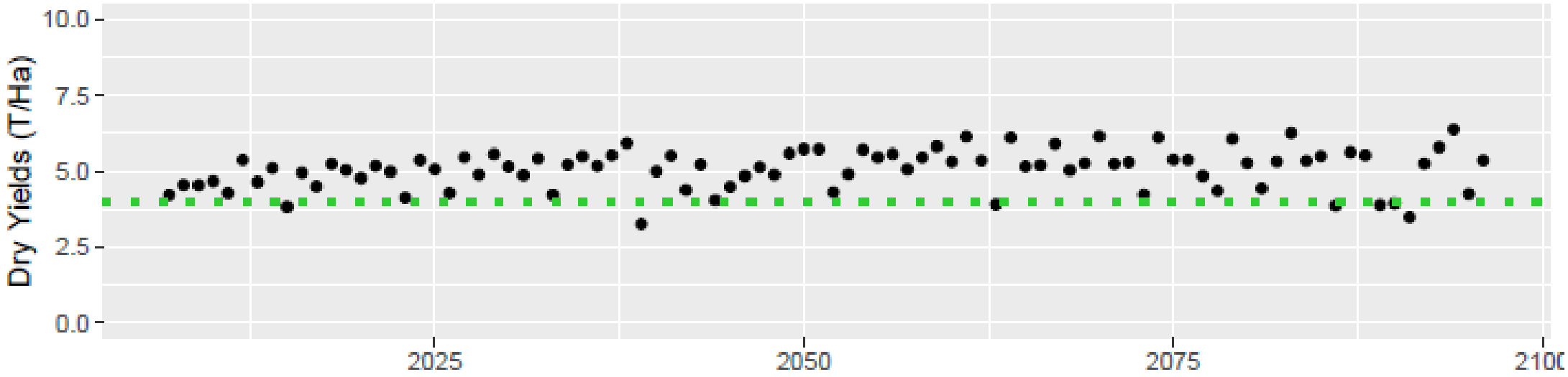
Spring wheat



- Slight increase in yields, but no significant change
- Higher amount of nitrate leaching over time; from 10 to 18 kg/ha
- Increase in N mineralization; from 49 to 91 kg/ha

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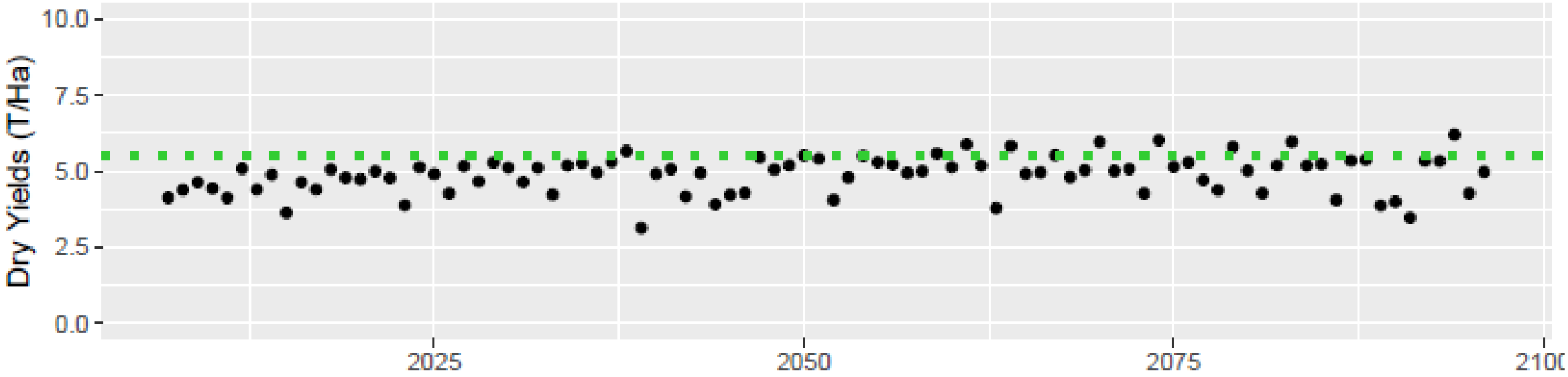
Oat



- Slight increase in yields, but no significant change
- Higher amount of nitrate leaching over time; from 10 to 19 kg/ha
- Increase in N mineralization; from 50 to 92 kg/ha

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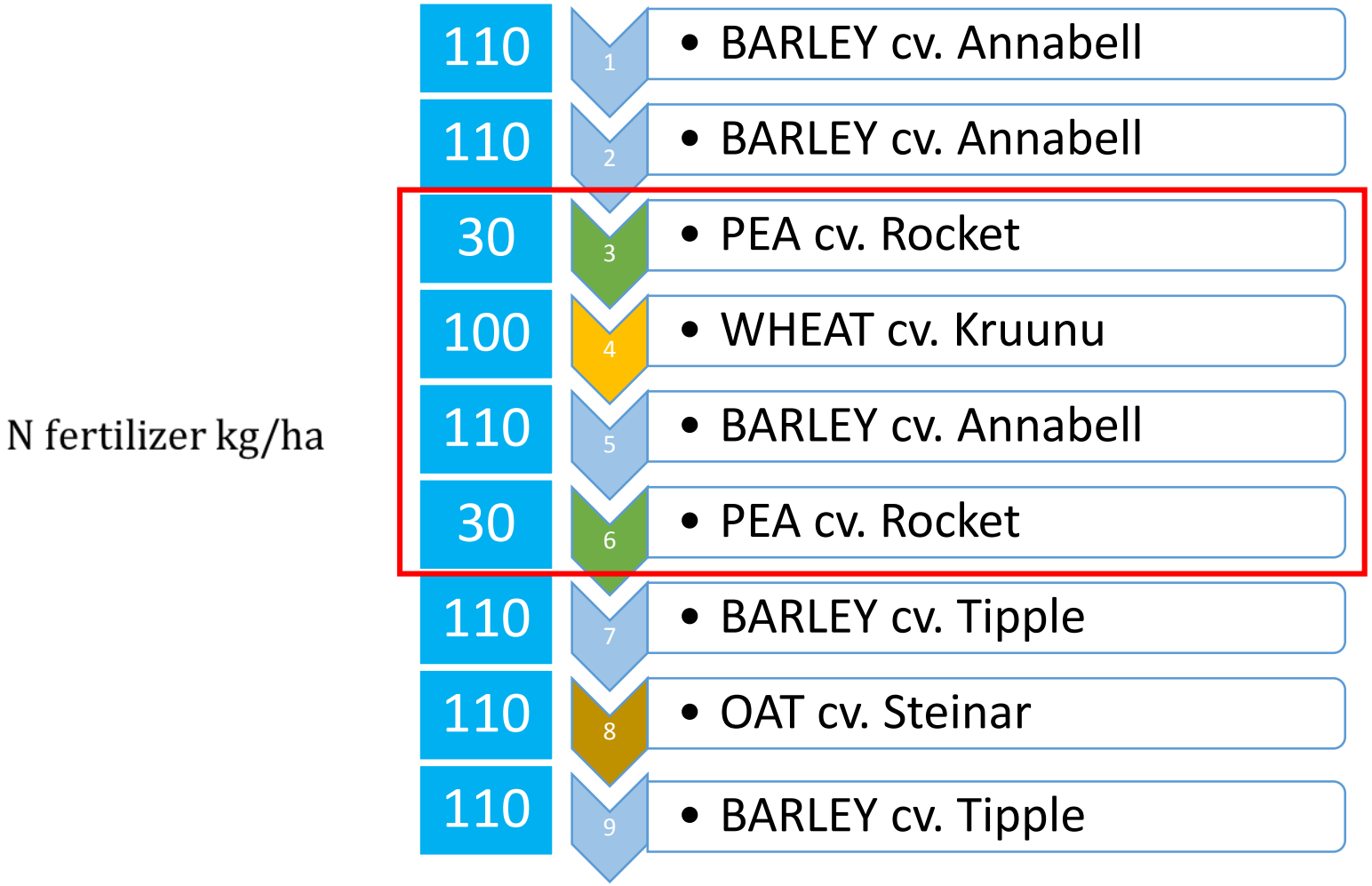
Adaptation 1 Helsinki: Inclusion of a legume



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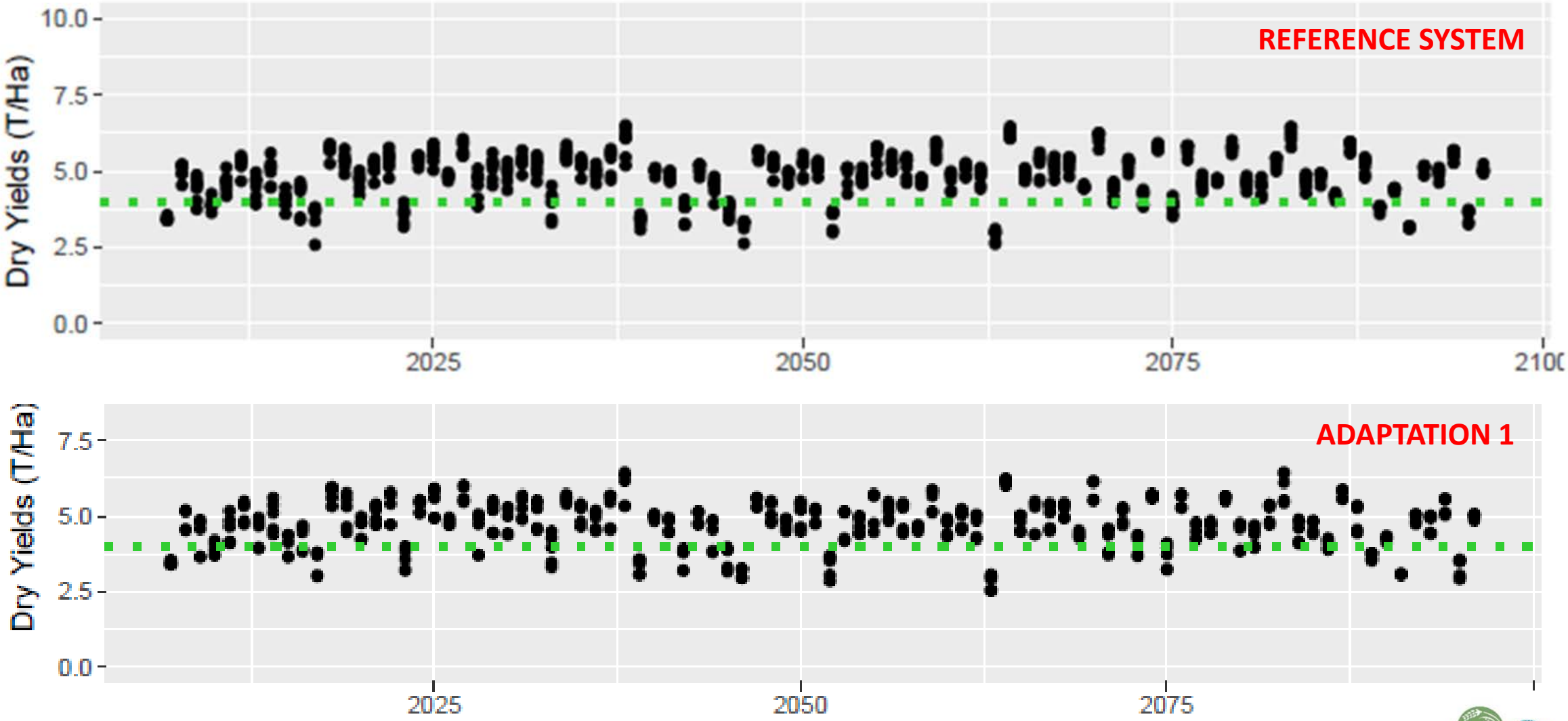
Spring barley – Adaptation 1



- Similar yields
- Higher amount of nitrate leaching; 17-36 kg/ha in A1 while 11-20 kg/ha in reference.
- Similar N mineralization.

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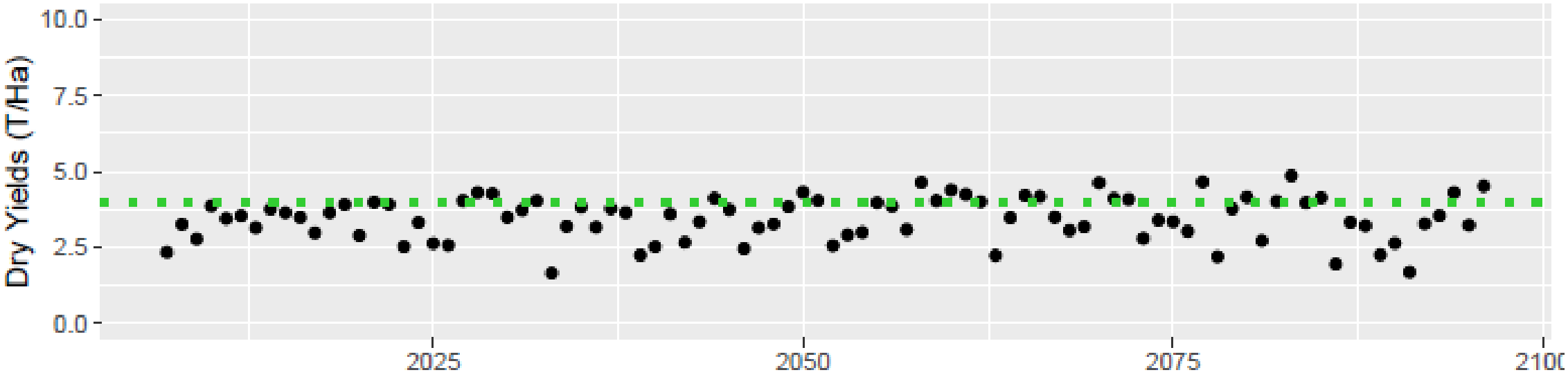
Spring pea – Adaptation 1



- Fluctuating yields, more than in cereals
- Similar N mineralization as in cereals
- More peaks of drought stress than for barley

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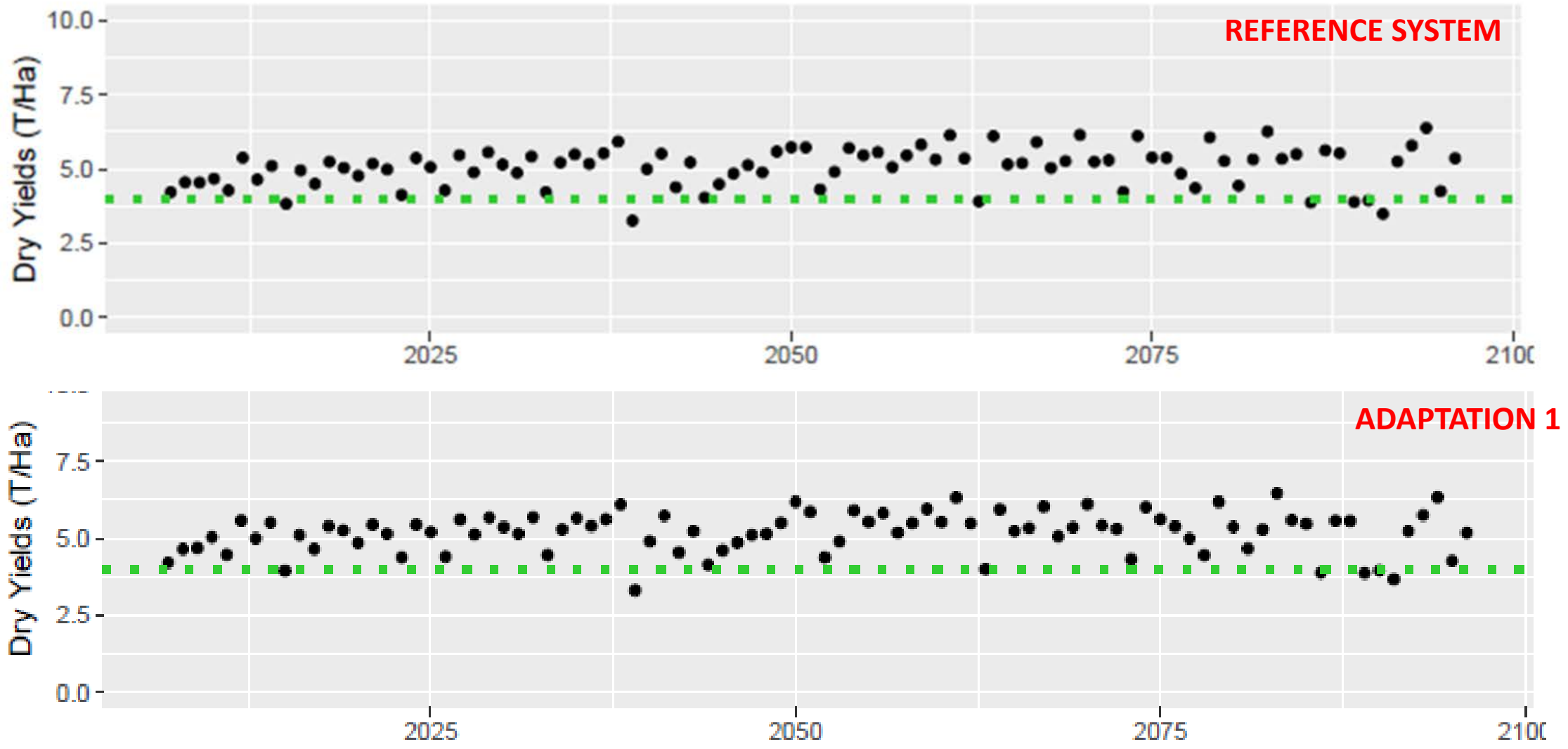
Spring wheat – Adaptation 1



- Similar yields
- Tendency for increased nitrate leaching; 12-22 kg/ha in A1 while 10-18 kg/ha in reference
- Similar N mineralization

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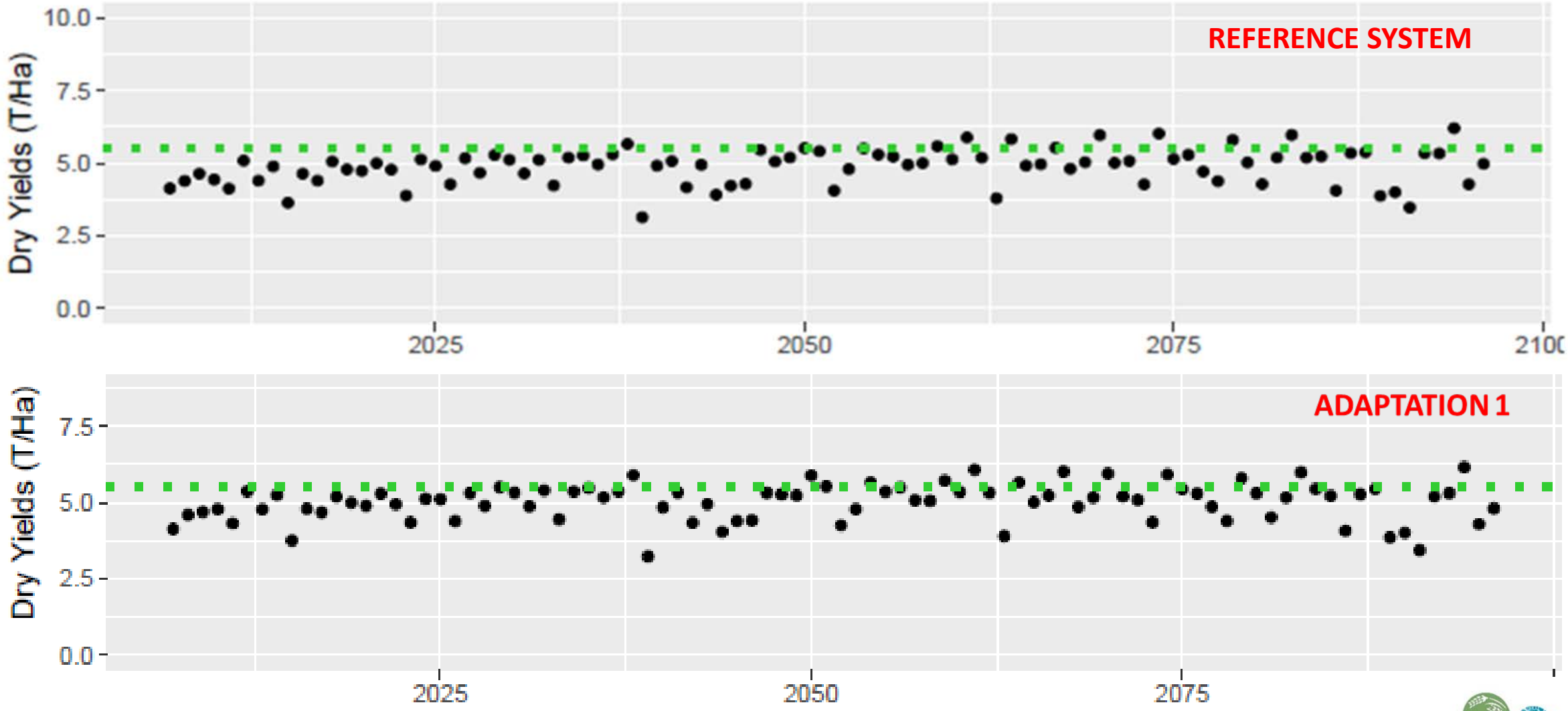
Spring oat – Adaptation 1



- Similar yields
- Tendency for increased nitrate leaching; 13-23 kg/ha in A1 while 10-19 kg/ha in reference
- Similar N mineralization

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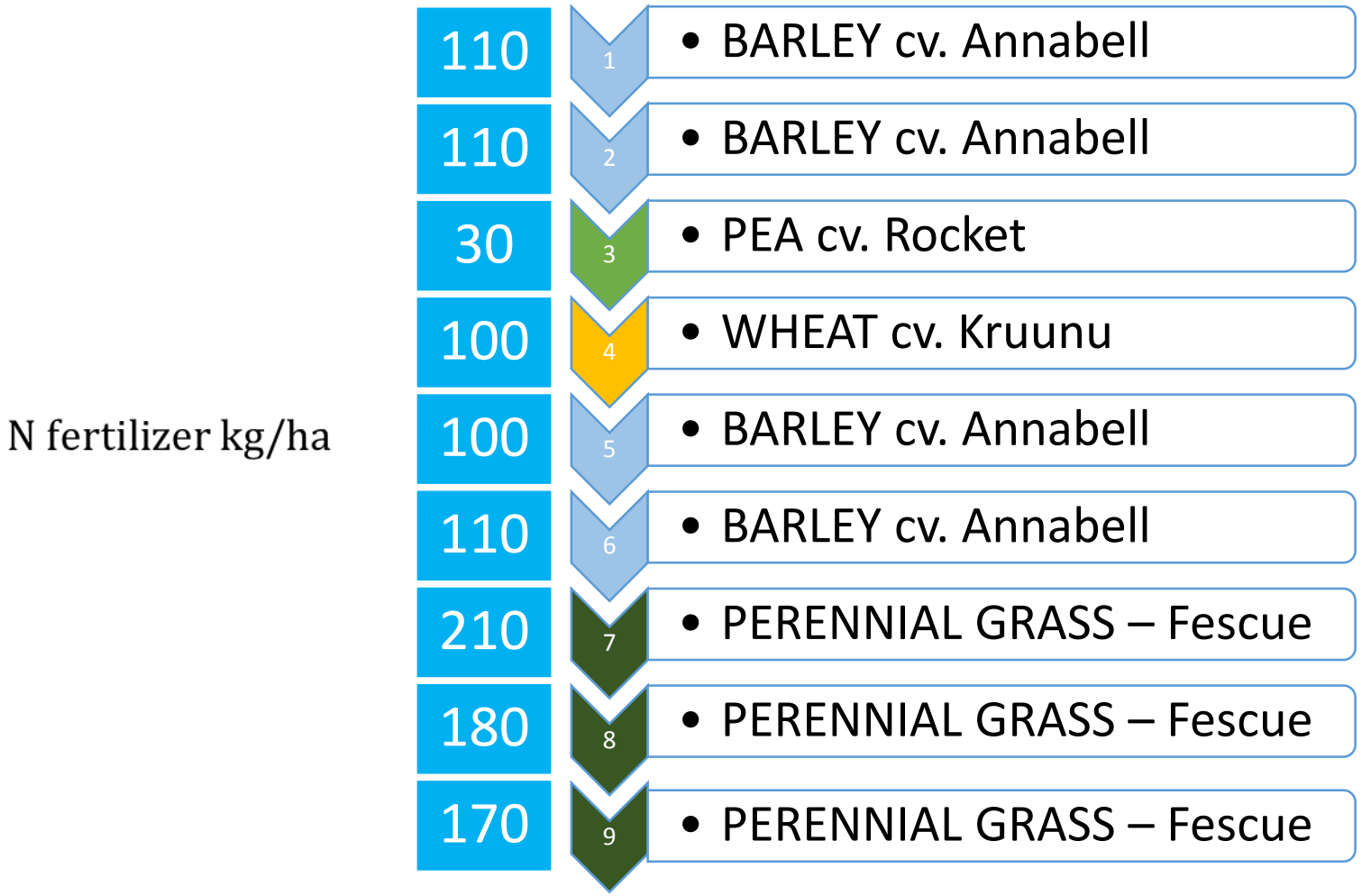
Adaptation 2 Helsinki: Inclusion of perennial grass



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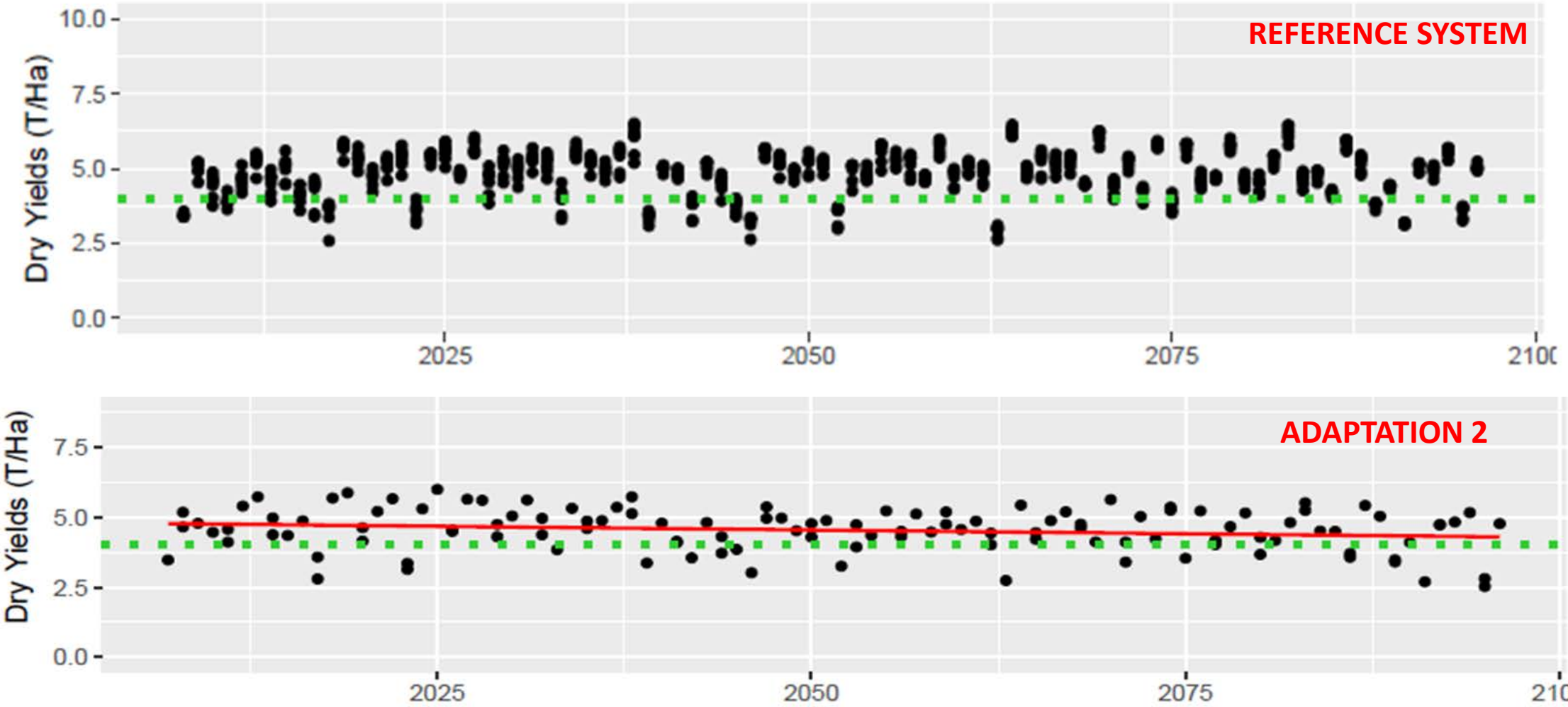
Spring barley – Adaptation 2



- Lower yields
- Tendency for increased nitrate leaching; 16-26 kg/ha in A2 while 11-20 kg/ha in reference
- Lower N mineralization; 47-68 kg/ha in A2 while 50-93 kg/ha in reference

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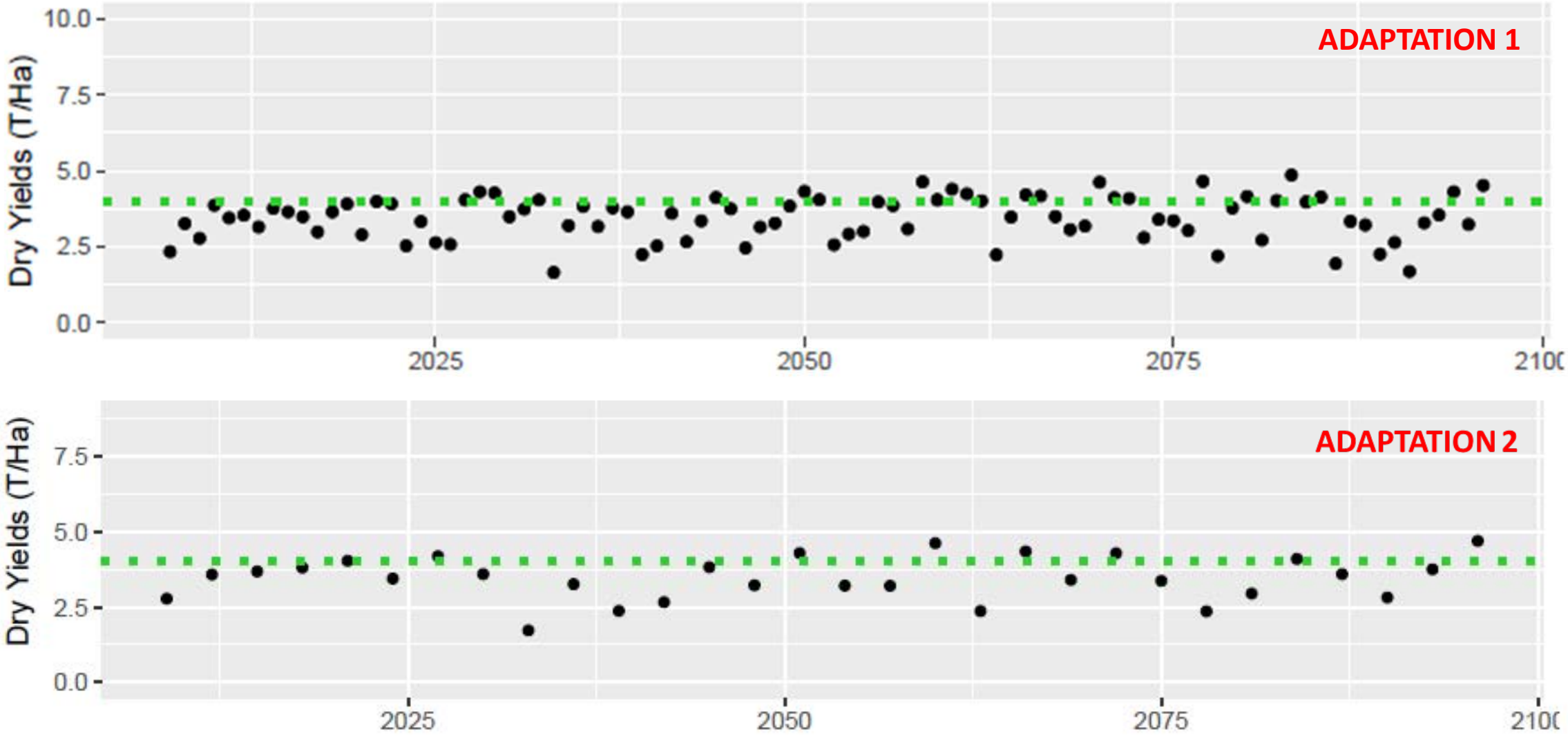
Spring pea – Adaptation 2



- Similar yields
- Similar nitrate leaching; 13-20 kg/ha in A2 and 11-18 kg/ha in A1
- Slightly reduced N mineralization; 50-69 kg/ha in A2 while 50-88 kg/ha in A1

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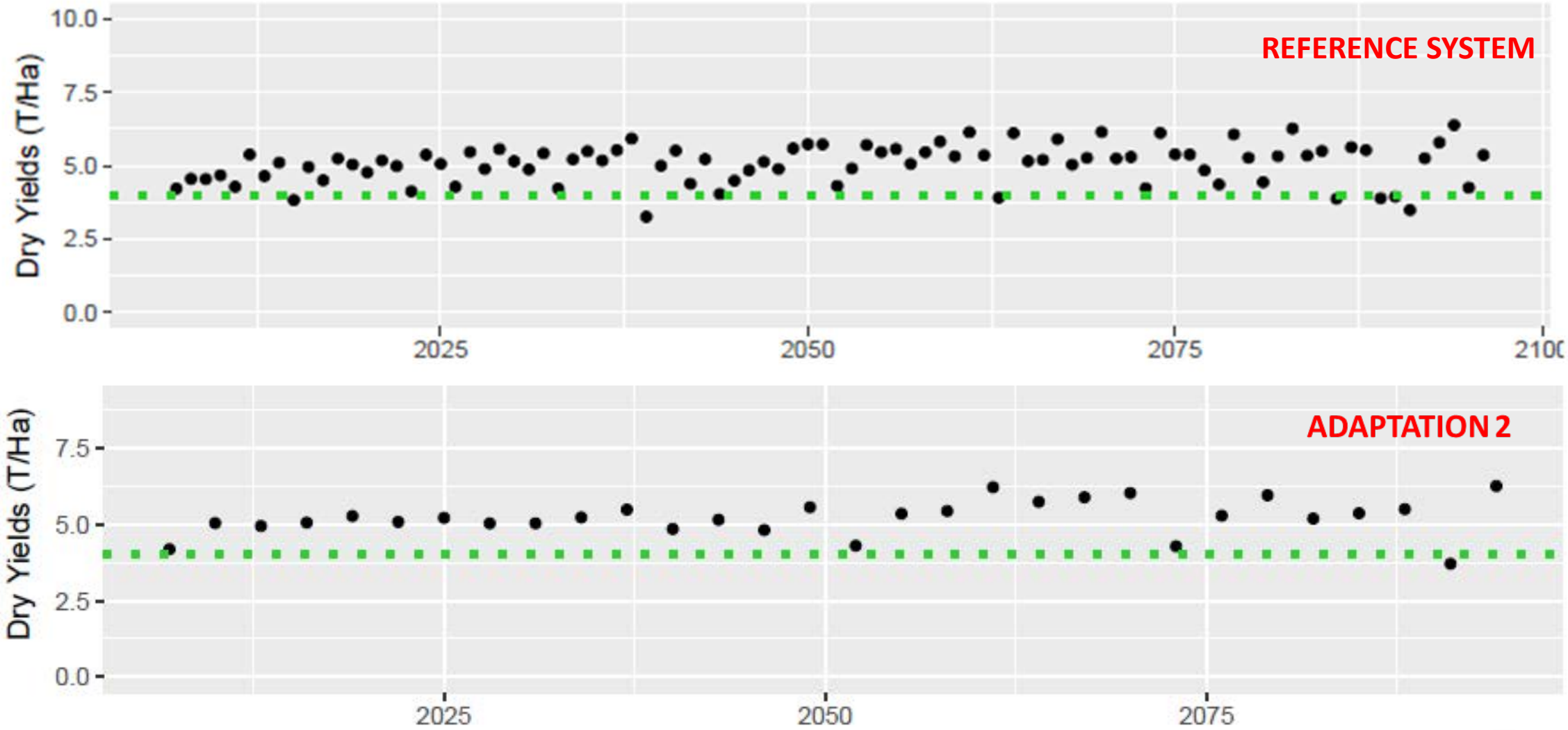
Spring wheat – Adaptation 2



- Similar yields
- Similar nitrate leaching
- Reduced N mineralization; 43-68 kg/ha in A2 while 49-91 kg/ha in reference

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Perennial forage grass – Adaptation 2

Slightly increased yields over time
Slightly increased N mineralization over time

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