

Apple trees, larches and their water uptake:

distinct ecohydrological systems in contrasting environmental settings?

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RESEARCH QUESTIONS

- What type of water do trees use?
→ Precipitation vs. groundwater
→ Ground depth of root water uptake
- Contrasting environments = distinct ecohydrological conditions?

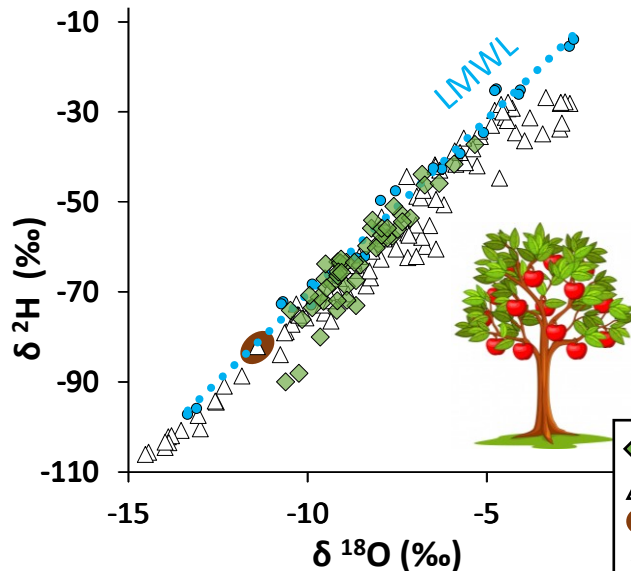
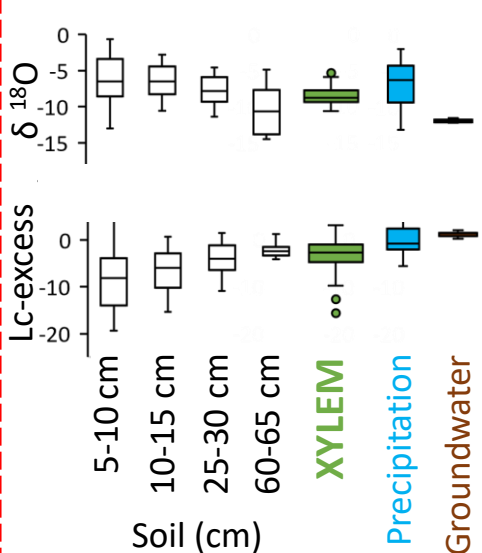
PRELIMINARY FINDINGS

Rainfall major water source (vegetative season 2020)

- Apple trees** → use of fractionated water from intermediate soil depth, irrigated groundwater not important?
- Larches** → use of not/slightly fractionated water, little overlap with soil water. Access to a deeper rainwater storage?

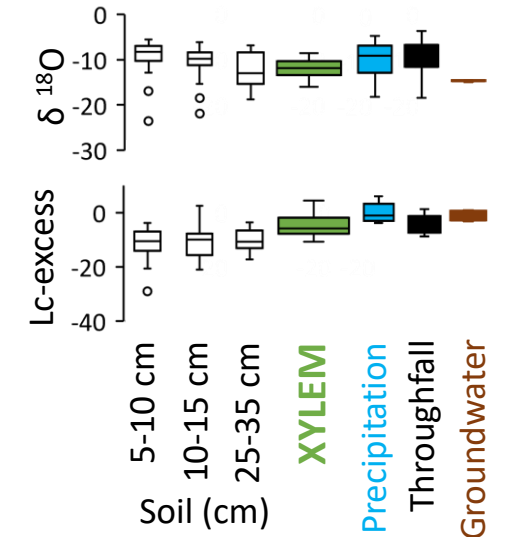
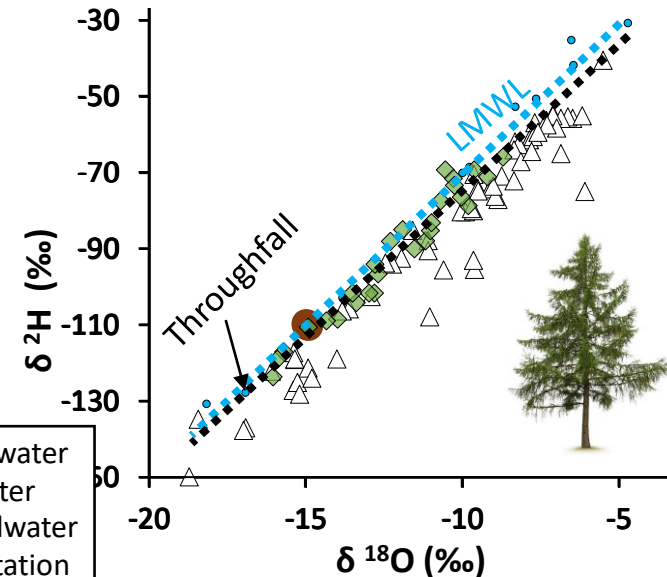
APPLE YARD (Binnenland)

- Intensive farming, dripping irrigation
- Adige floodplain, deep sandy soil



CONIFEROUS FOREST (Matsch)

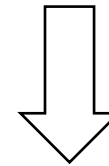
- Steep slopes, 2000 m a.s.l.
- Shallow skeletal soil (30-80 cm)



Water Mixing in the Critical Zone...WATZON!

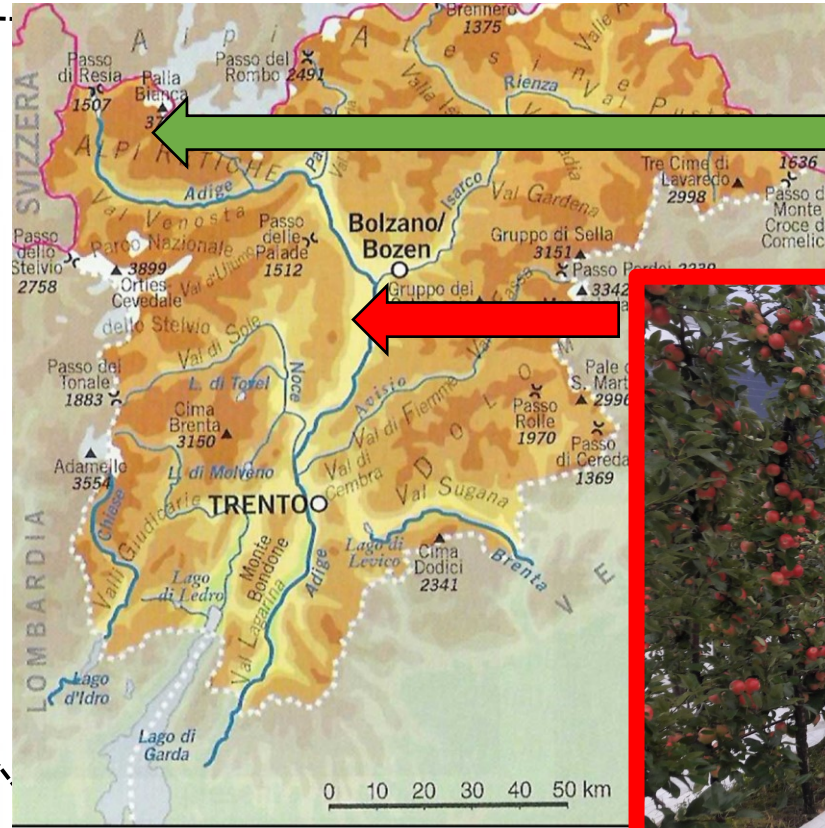


- Italian project
- Ecohydrological conditions of different natural and seminatural environments
- Different climates, vegetation types, elevation

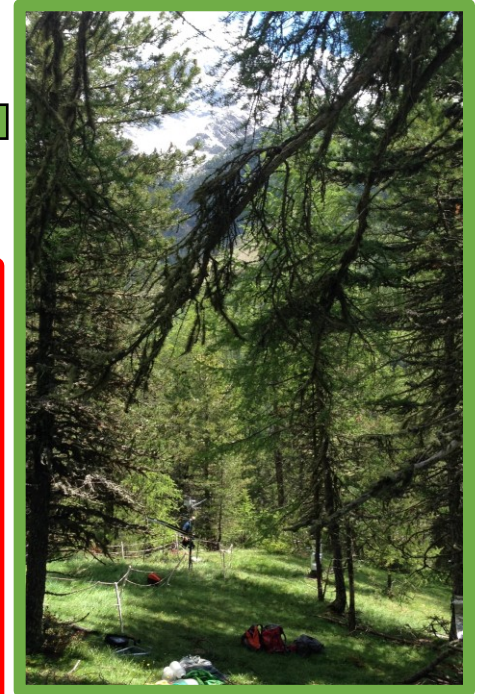


7 CRitical zone Observation Study SitES
(CROSSES)

WATZON PROJECT...study sites in South-Tyrol

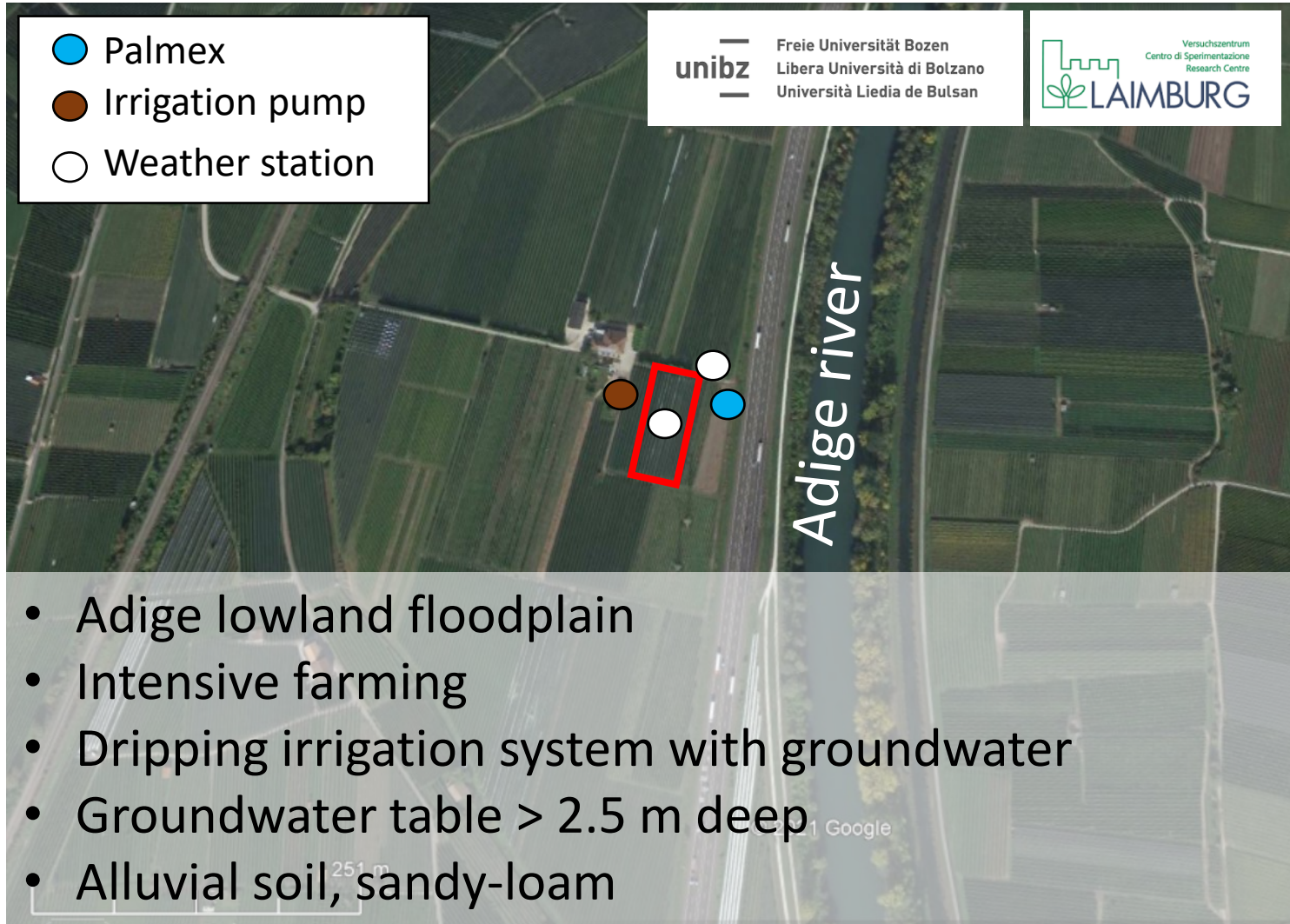


BINNENLAND
Apple yard

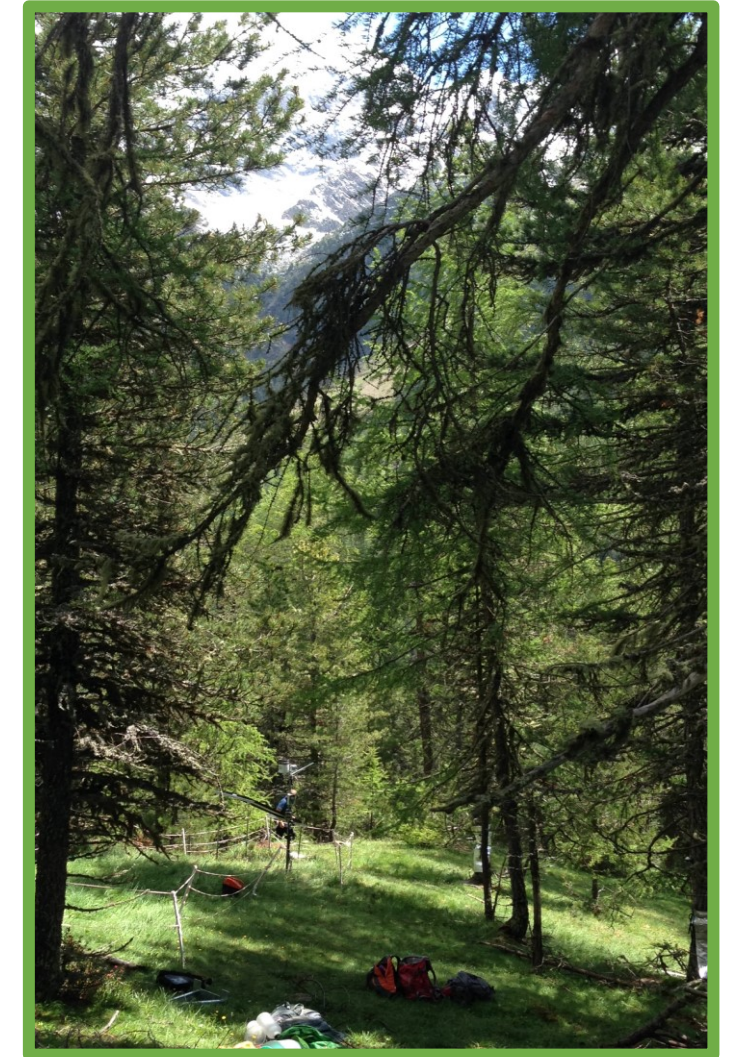
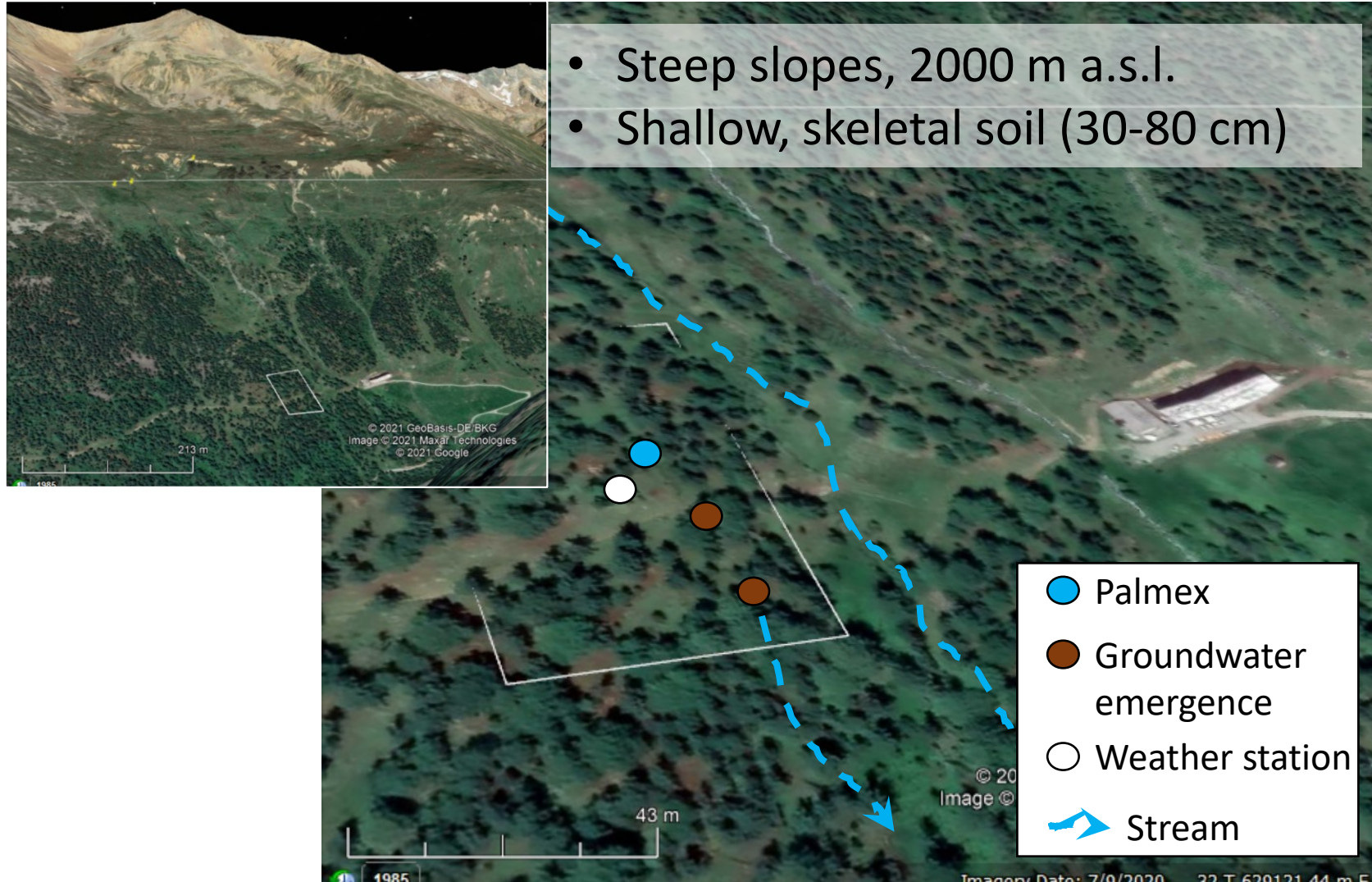


MAZIA
Coniferous
forest

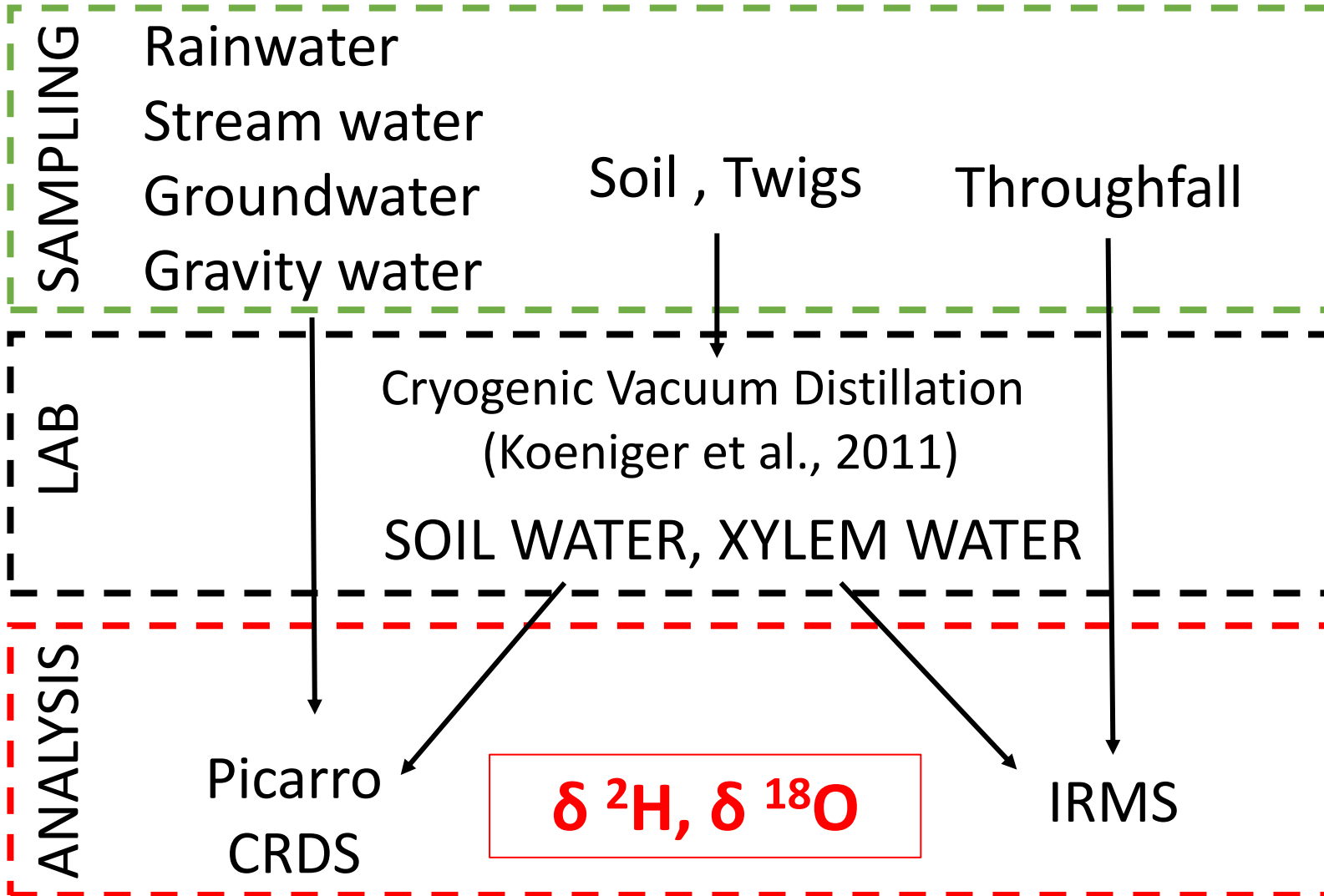
The apple yard: Binnenland



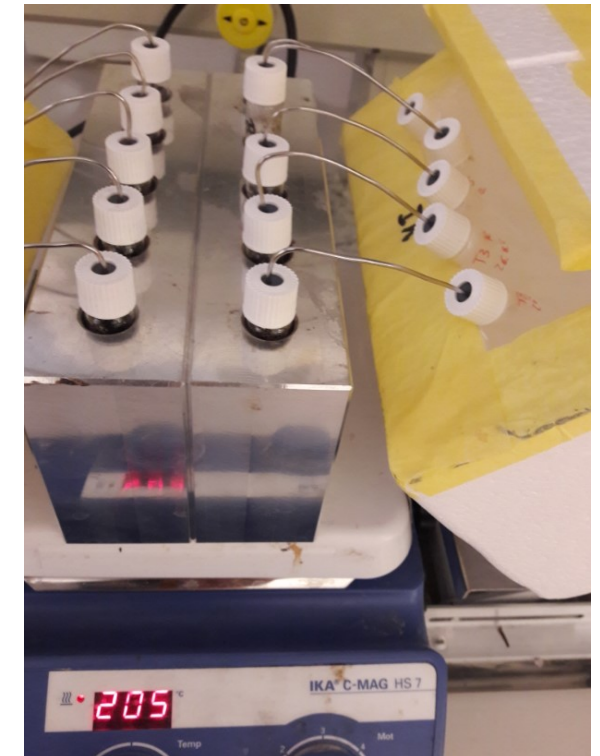
The coniferous forest: Matsch/Mazia



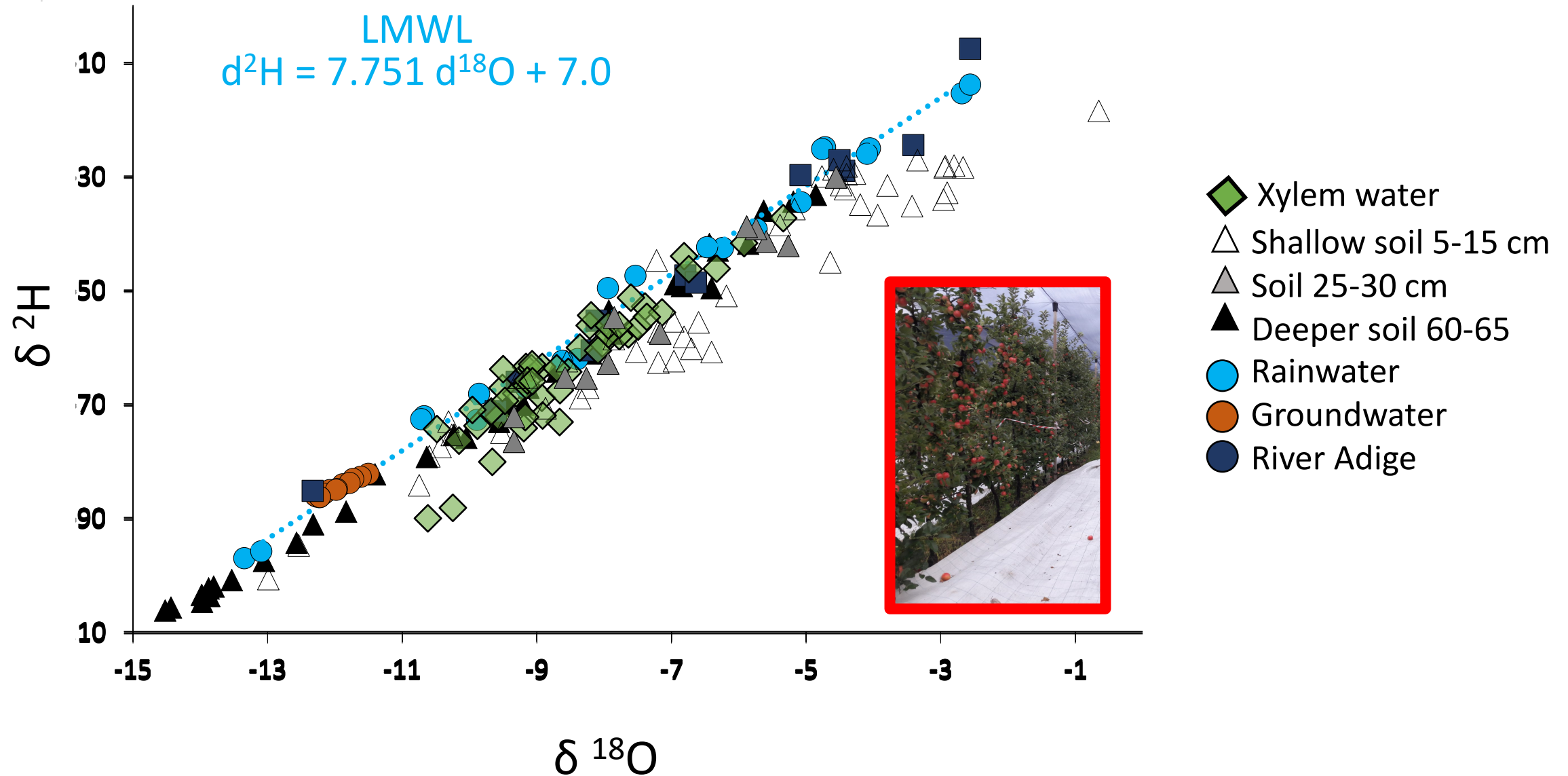
METHODS



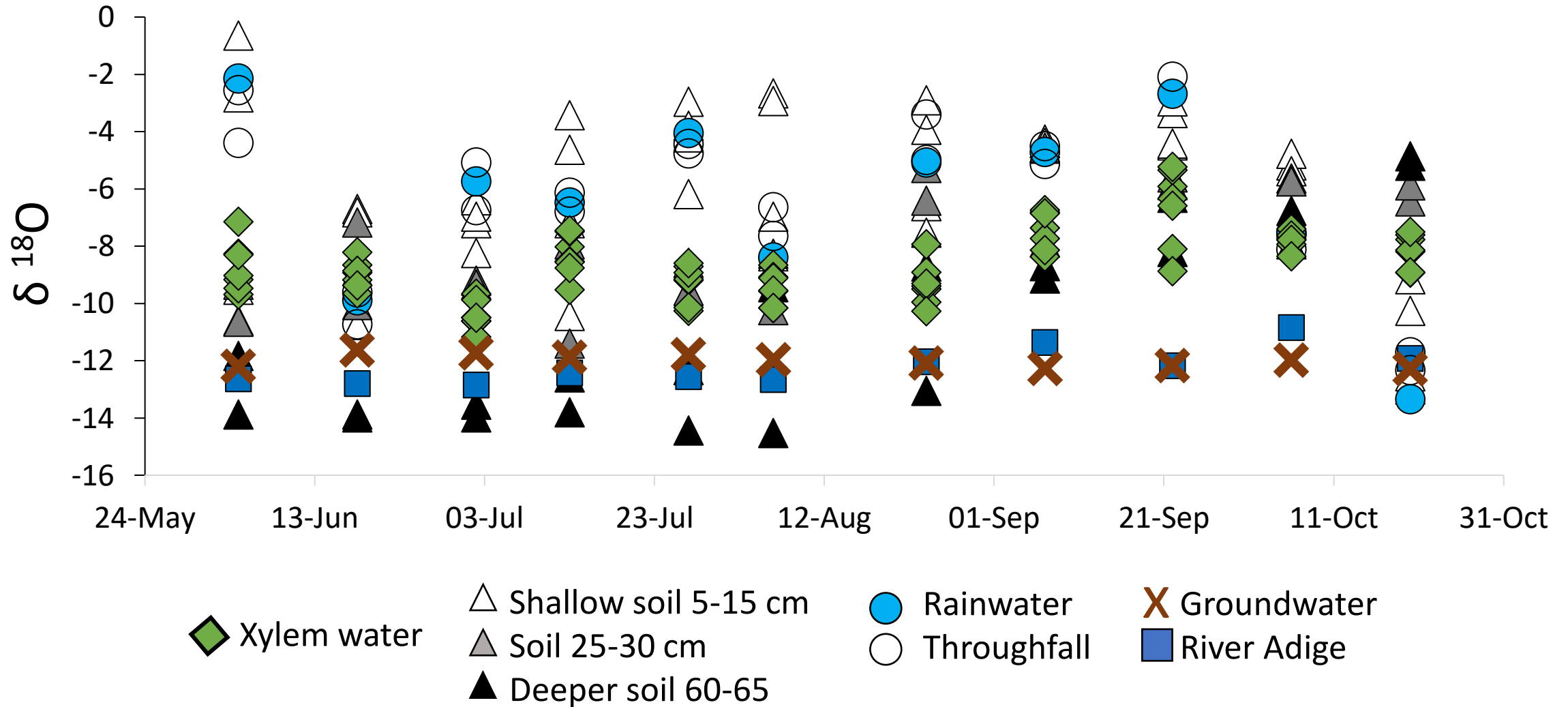
- Fortnightly field campaigns
- End of May – end October 2020



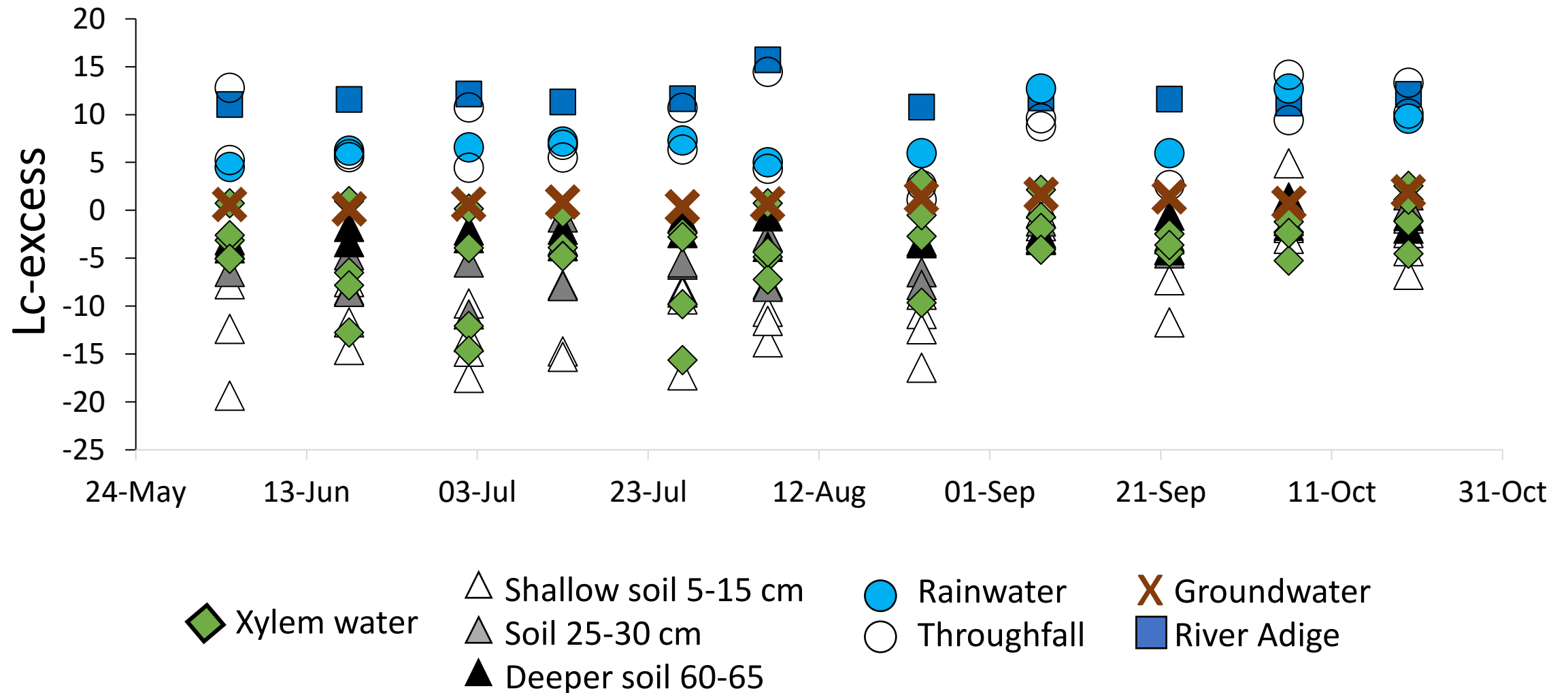
The apple yard



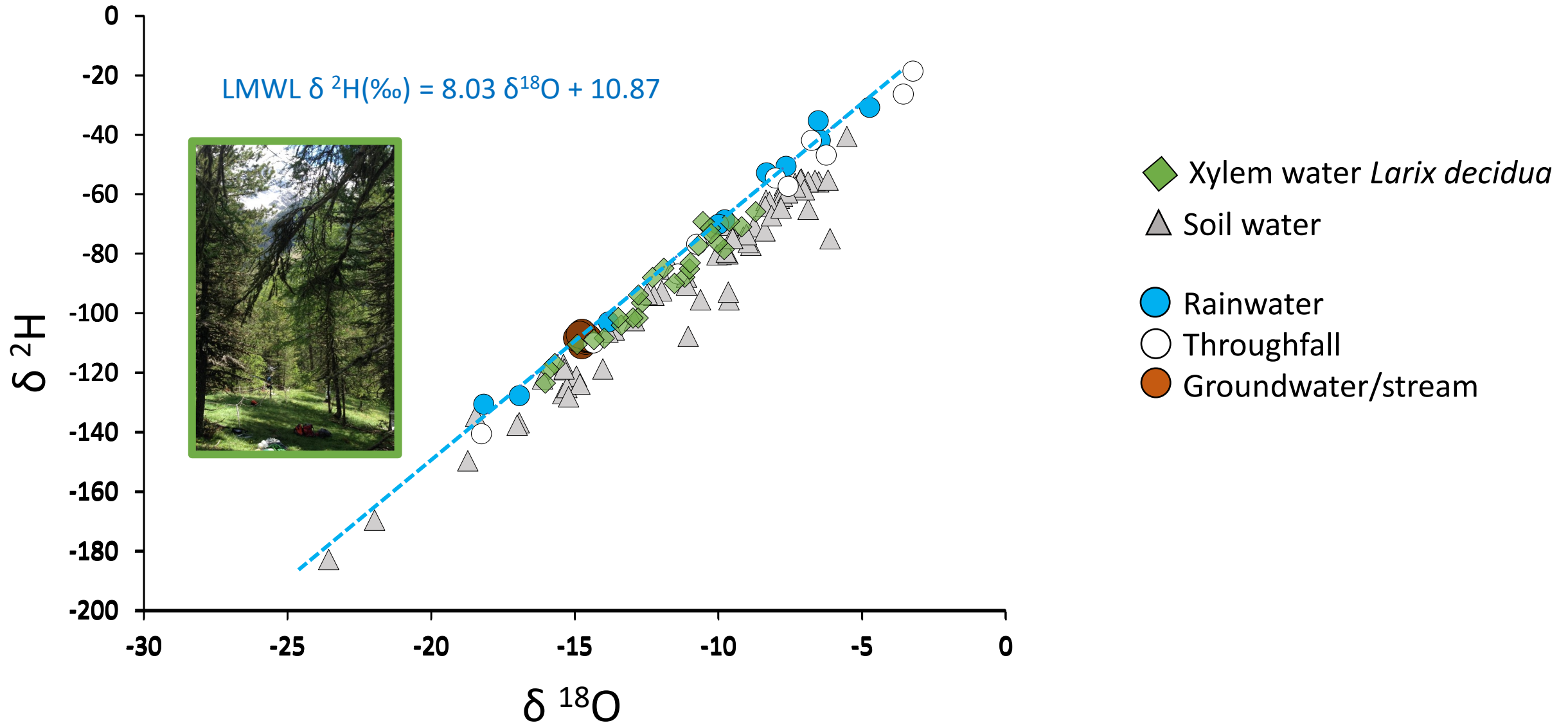
The apple yard



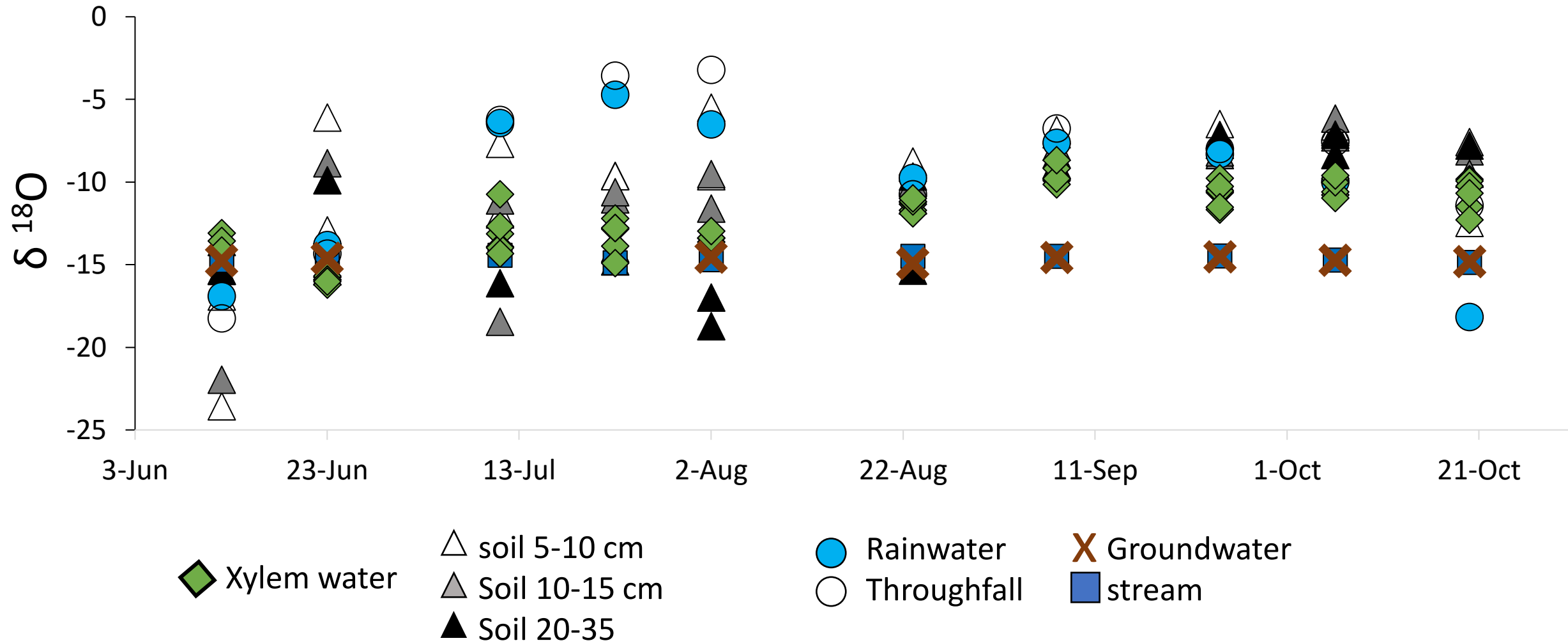
The apple yard



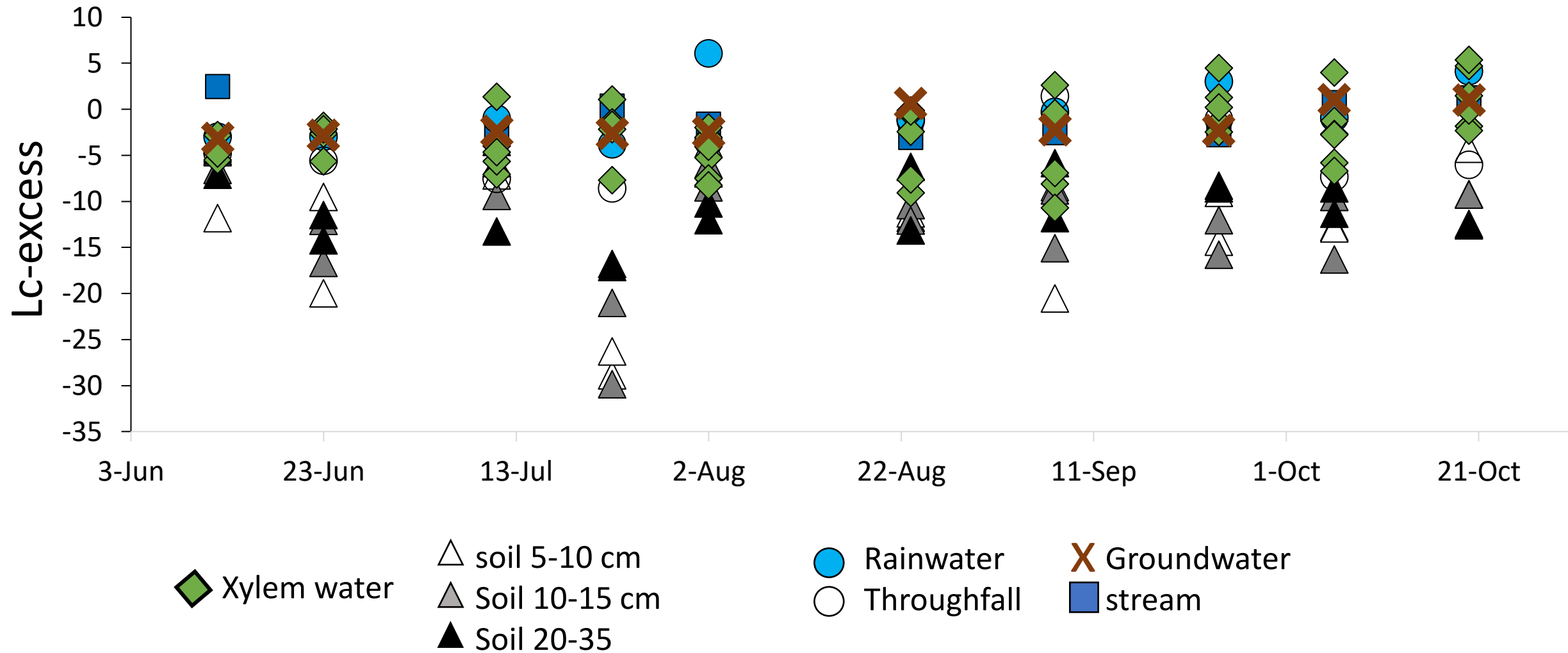
The coniferous forest



The coniferous forest



The coniferous forest



TAKE HOME MESSAGES

Apple yard

- Apple trees mainly use soil water from intermediate depths (20-30 cm)
- Major contribution from rainfall, yet irrigated groundwater important in some occasions

Coniferous forest

- Larch trees mainly use rainfall, also accessed in the soil profile
- Occurrence of a rainwater reservoir deeper in the ground (e.g., deeper soil among cobbles, regolite, fractured bedrock)?