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Yellow nutsedge: what control strategies work in practice?

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Background

- *Cyperus esculentus* (yellow nutsedge), sedge from the Cyperaceae family
- Spreads mostly via tubers
- High reproductive potential
- Few effective herbicides available

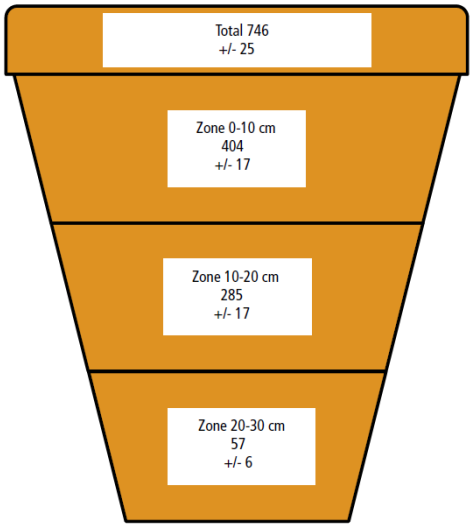
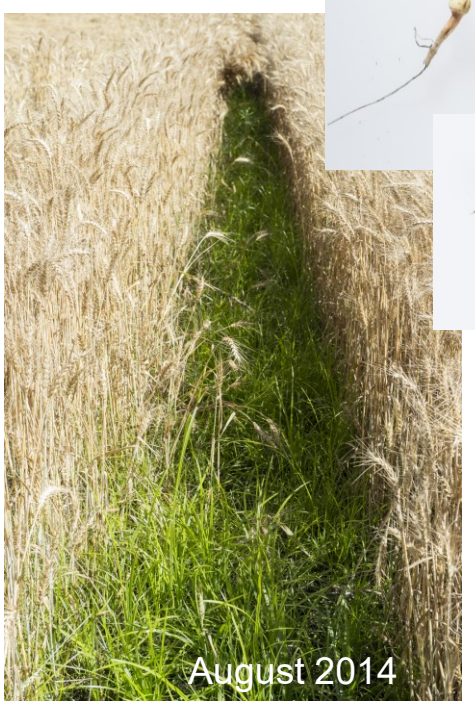


Abb. 2 | Zahl der Knöllchen pro Topf und pro Schicht nach einer Vegetationsperiode ausgehend von einem Knöllchen pro Topf. Werte sind Mittelwerte ± Standardfehler aus jeweils 15 Werten.

Bohren and Wirth, 2015, Agrarforschung



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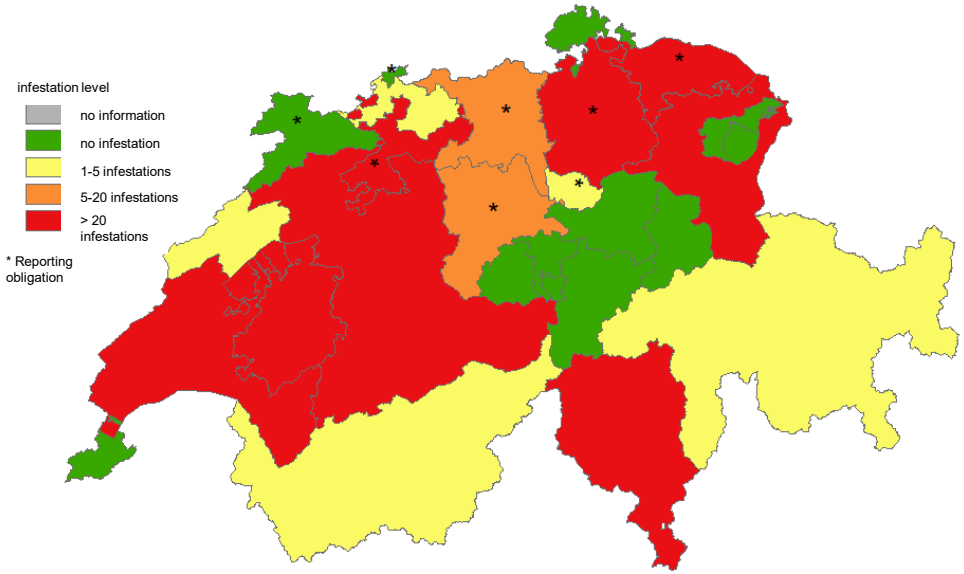
Situation in Switzerland



Current distribution of yellow nutsedge in Switzerland. Reference: Nationale Koordination Erdmandelgras, Alexandra Schröder (end of 2021).

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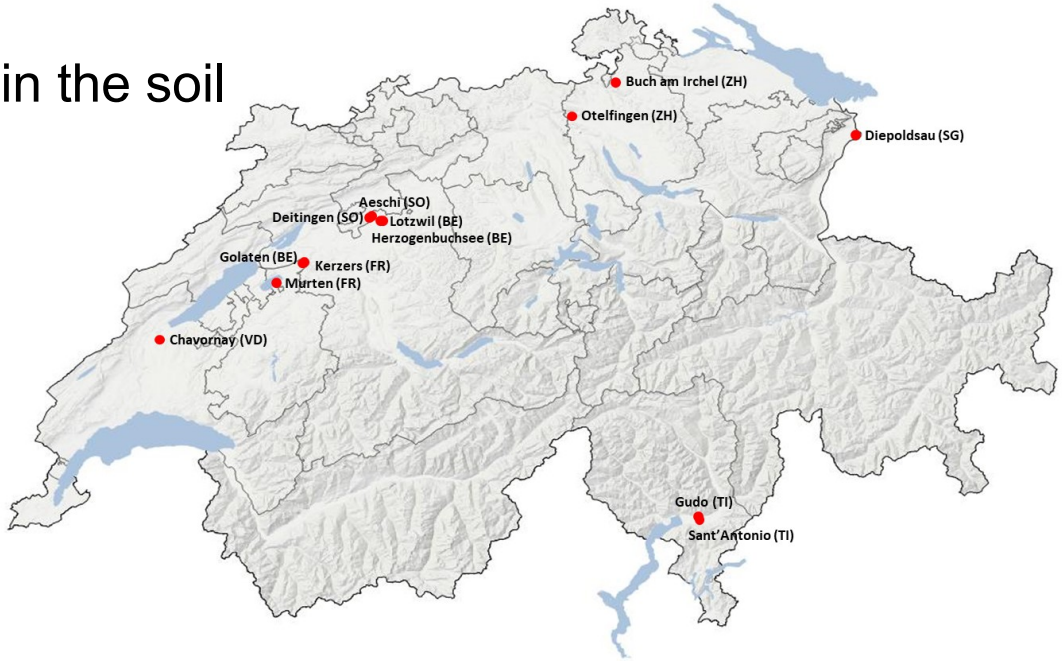
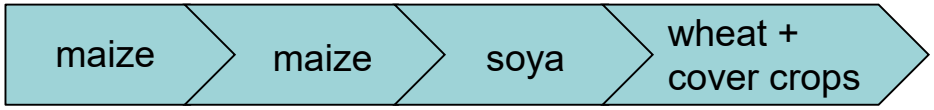
Experimental setup control strategies

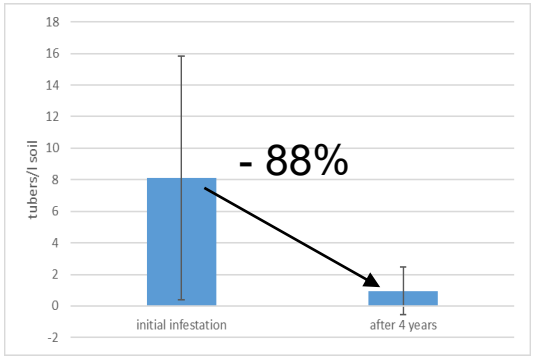
- Combination of different control measures and adaptation of the crop rotation in a four year on farm project (2016 – 2019)
- 14 farms (21 fields)
- Farmers and advisors carried out the trials
- Monitoring of tuber numbers in the soil



Successful control strategies

- adapted crop rotation





- most suitable crop: late sown maize
  - repeated soil cultivation in spring to destroy nutsedge plants
  - incorporation of s-metolachlor before sowing of maize
  - late sowing of maize (after May 20th)
  - post emergence herbicides like Equip Power, Basagran (Bentazon), Callisto (Mesotrione)

- cultivation of winter wheat partially reduced infestation level
- only dense pastures with intensive usage can reduce nutsedge infestation

BUT after 4 years of control strategies there were still nutsedge tubers in the soil on every one of the 21 fields!

Experimental setup fallow

Repeated soil cultivation with tillage implements that bring rhizomes and tubers to the surface to dry out, destroys yellow nutsedge in a young growth stage (before tuber formation)

Each soil cultivation stimulates tuber germination
→ tuber seed bank in the soil decreases
→ no new tuber formation

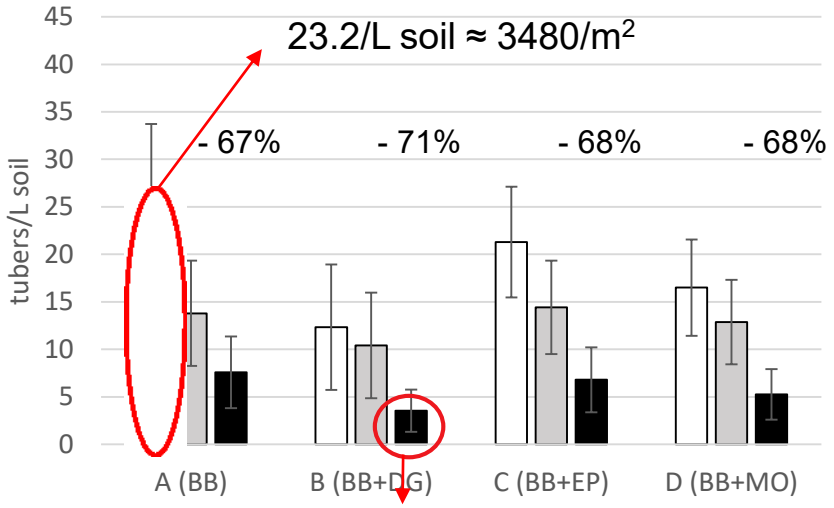
rotary harrow

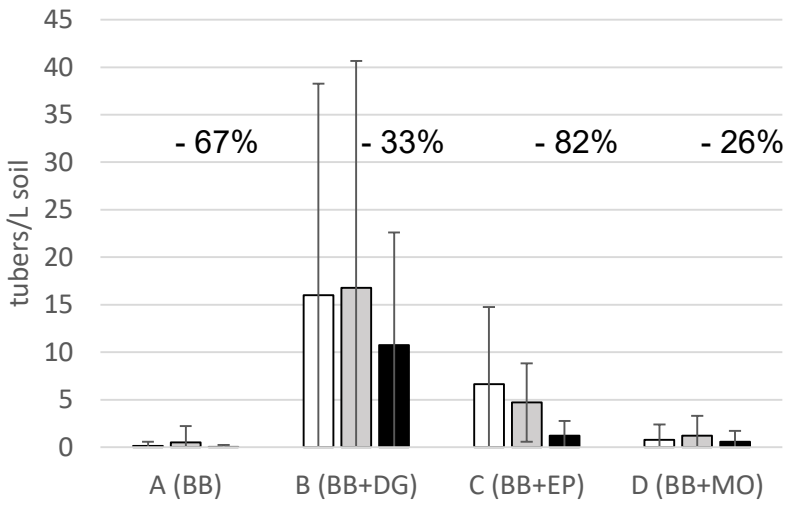
A	Only soil cultivation (BB)
B	BB + DG = 2 l/ha Dual Gold (S-metolachlor)
C	BB + EP = 1.5 l/ha Equip Power (Foramsulfuron, Thiencarbazone, Iodosulfuron)
D	BB + MO = 25 g/ha Monitor (Sulfosulfuron)

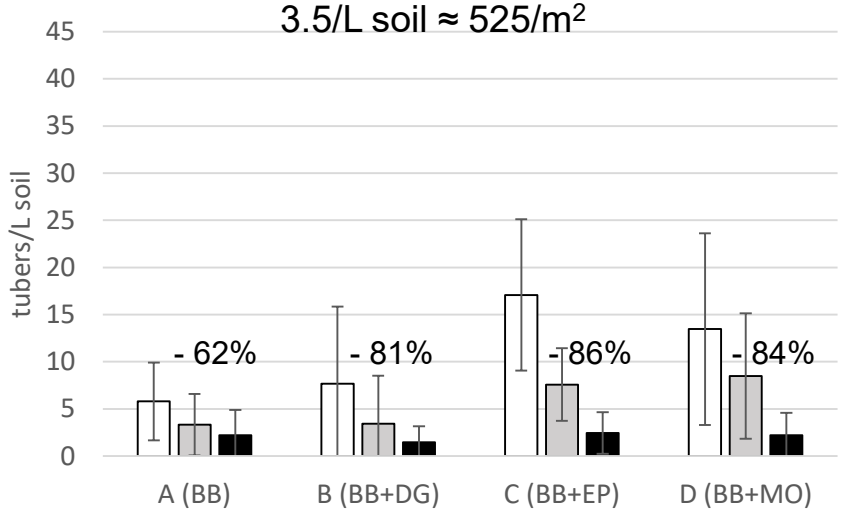

vibrocultivator

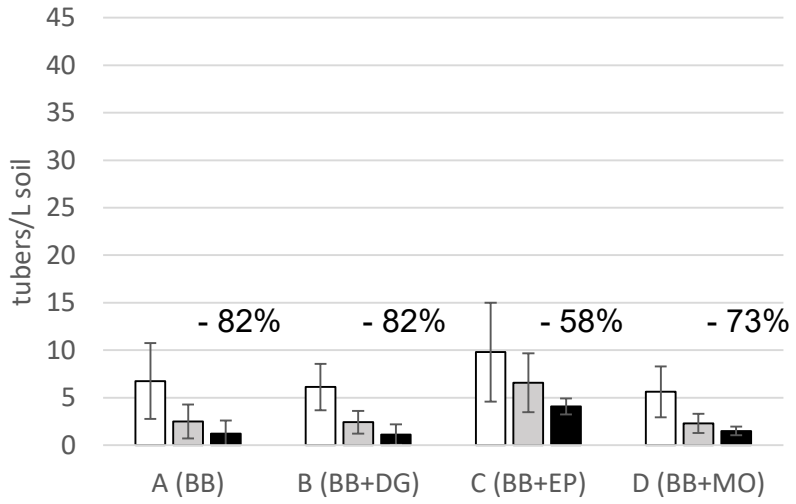
Results fallow

1 tuber per L soil ≈ 150 tubers per m²









initial infestation | after 1 year | after 3 years

Wirth et al., 2022, Unkrauttagung

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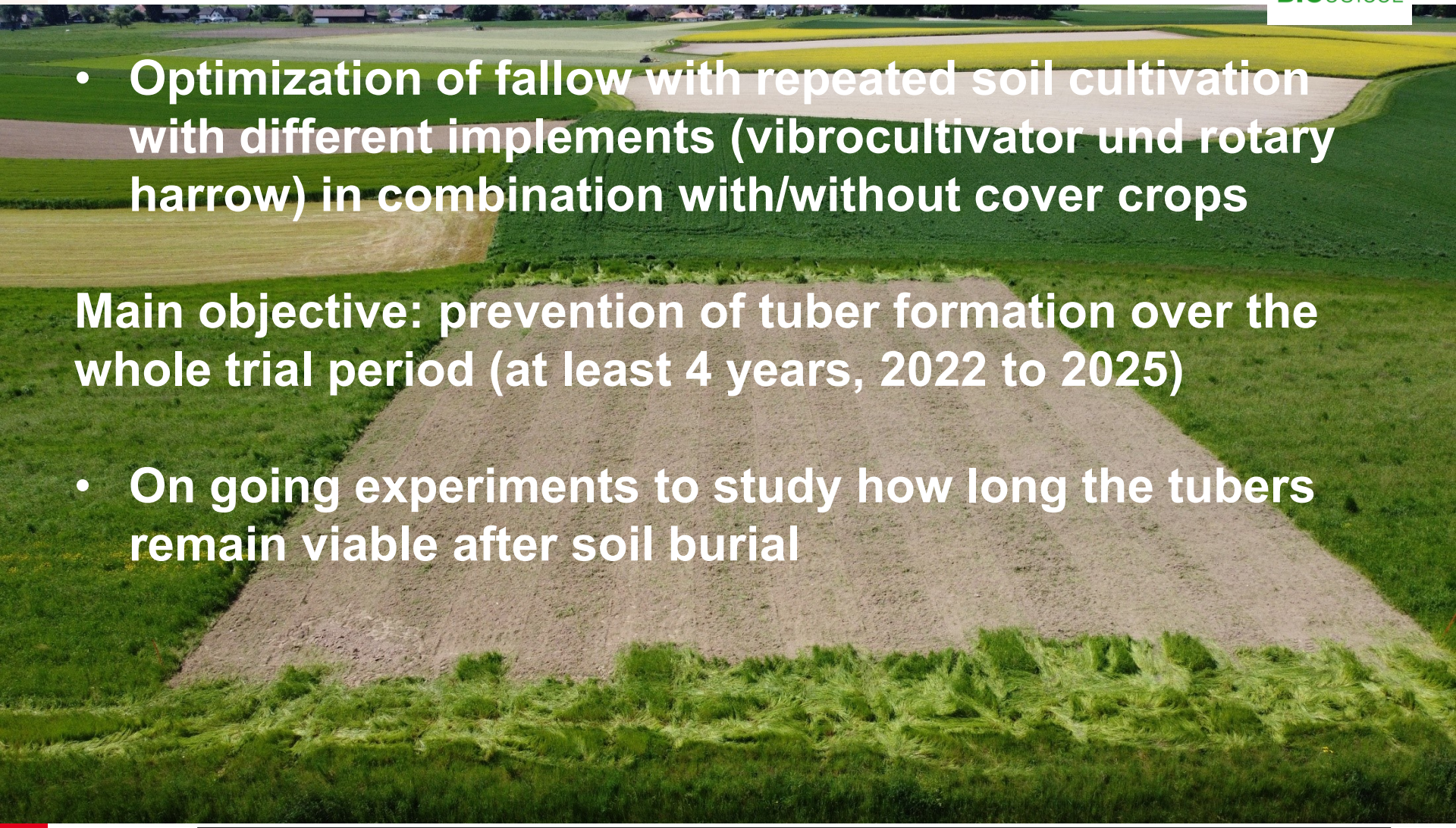
Outlook



- Optimization of fallow with repeated soil cultivation with different implements (vibrocultivator und rotary harrow) in combination with/without cover crops

Main objective: prevention of tuber formation over the whole trial period (at least 4 years, 2022 to 2025)

- On going experiments to study how long the tubers remain viable after soil burial












Thank you for listening

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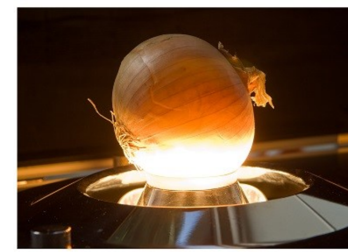









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