

Technical approaches for the reduction of pesticides and drift

Content

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2. Alternative orchard spray technique (tunnel technique) to reduce pesticide use and prevent drift

New technology for mechanical soil cultivation in orchards



Zimmer (2017) *Obstbau* 42: 532-535

Rootstock
care system
RADIUS SL
(Clemens
GmbH & Co.
KG, D)

ALM rolling
hoe
(Adelhelm
Landtechnik
Maschinen-
bau, D)



Zimmer (2017) *Obstbau* 42: 532-535

New technology for mechanical soil cultivation in orchards



Rootstock
cleaner
NATURA-
GRIFF
(NaturaGriff,
F)

KRÜMLER
LADURNER
MODELL 7
(Ladurner
Karl J. & Co.
OHG, I)



New technology for mechanical soil cultivation in orchards



Fibre device
ÖKO
CLEANER
(Vimas
GmbH, I)

Zimmer (2017) *Obstbau* 42: 532-535

High pressure (1,000 bar)
cold water injector
GrassKiller
(Caffini S.p.a., I)



Scheer & Hagl (2018) *Obstbau* 43: 20-22; 47-49

Chemical alternatives to glyphosate for weed control in orchards

Standard herbicides in orchards in Germany:

- Glufosinate (Basta) – application ban since 01 July 2017
- Glyphosate – application ban within the next 5 years?
- MCPA against broadleaf weeds

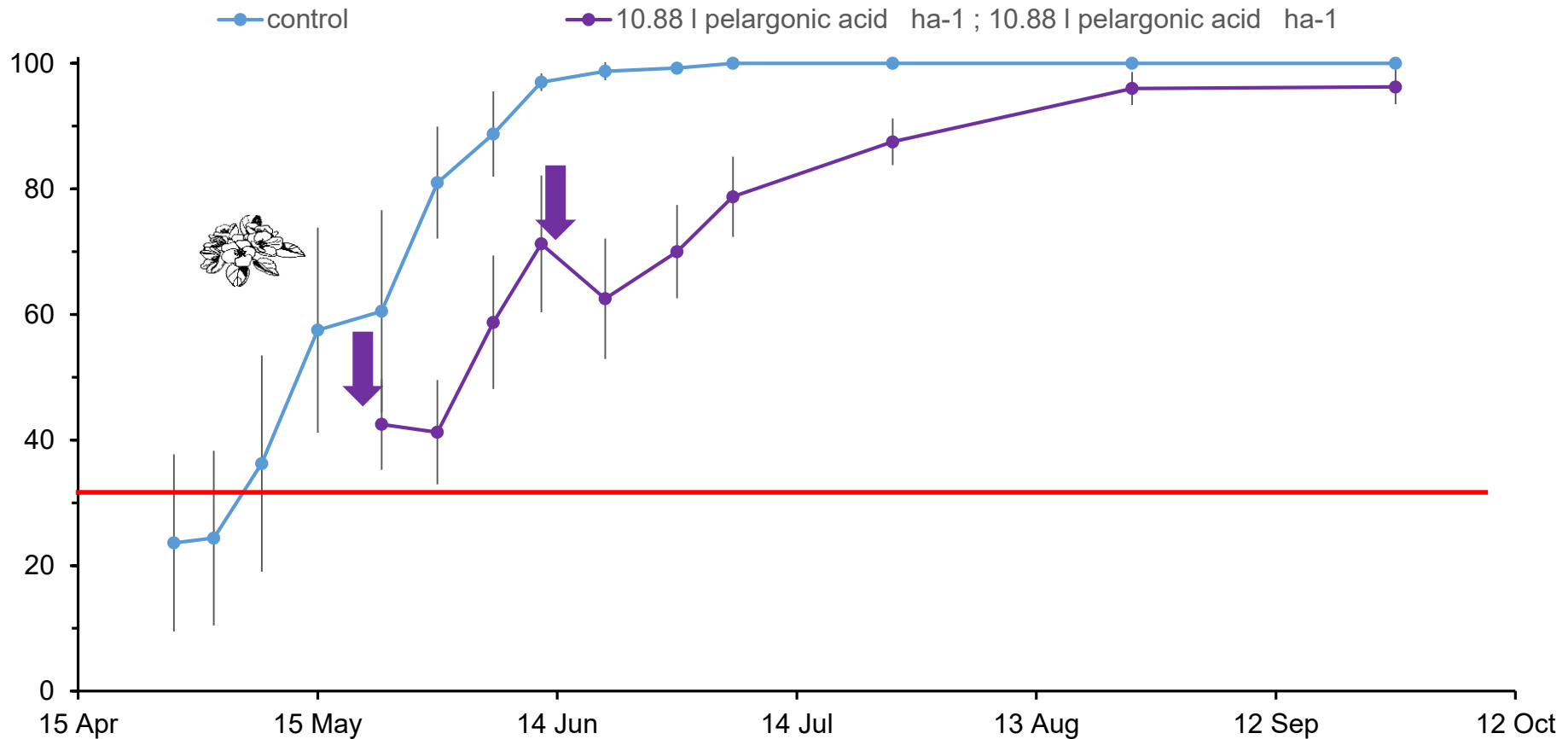
Residual herbicides (not commonly used):

- Propyzamide (Kerb Flo) against grasses in winter
- Flumioxazin (Vorox F) against broad leaf weeds – ban end of 2019?
- Flazasulfuron (Chikara Duo) – only in combination with glyphosate at the moment

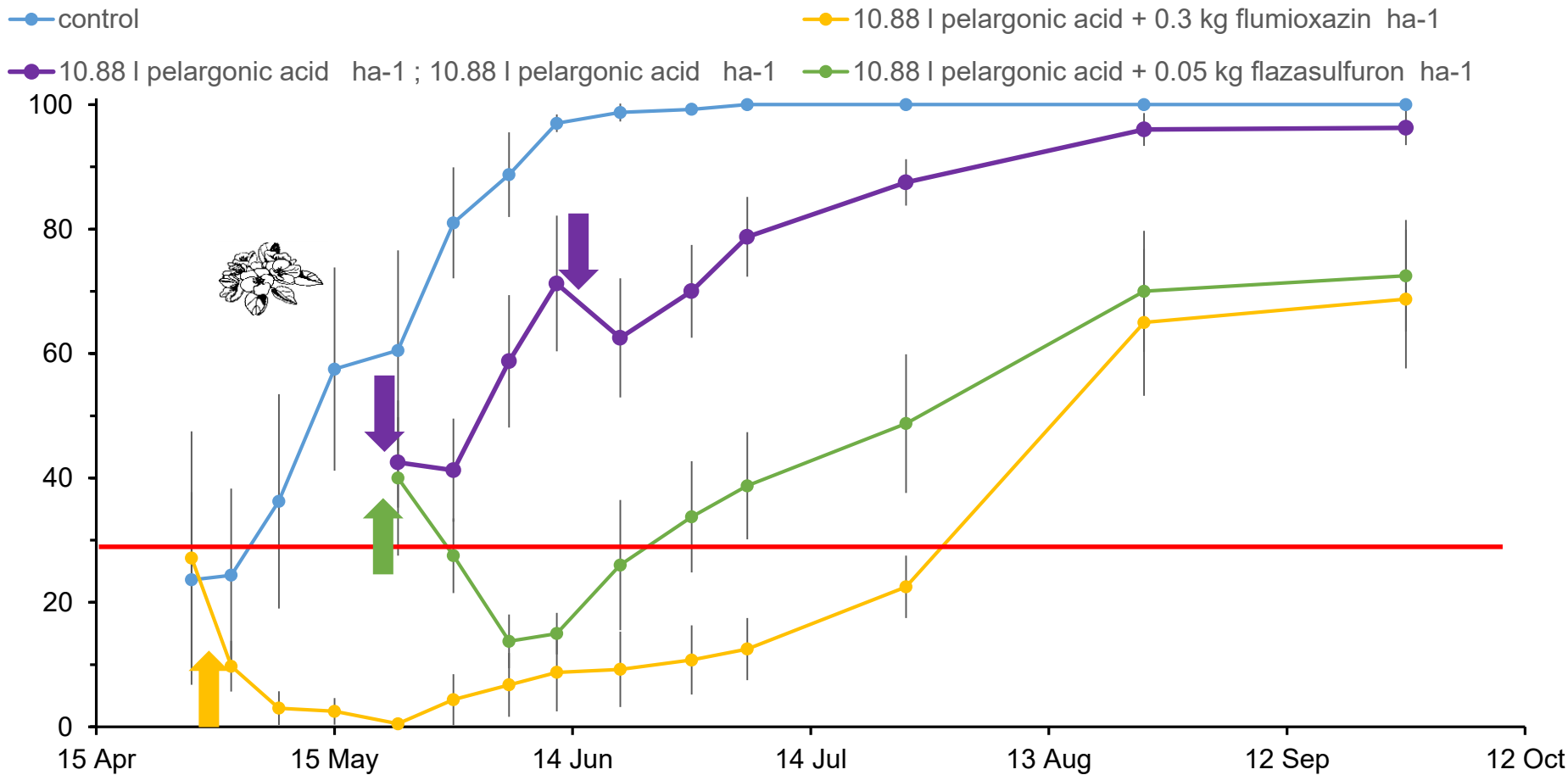
(New) and organic herbicides:

- Pelargonic acid (e.g. Beloukha) – total herbicide currently without registration

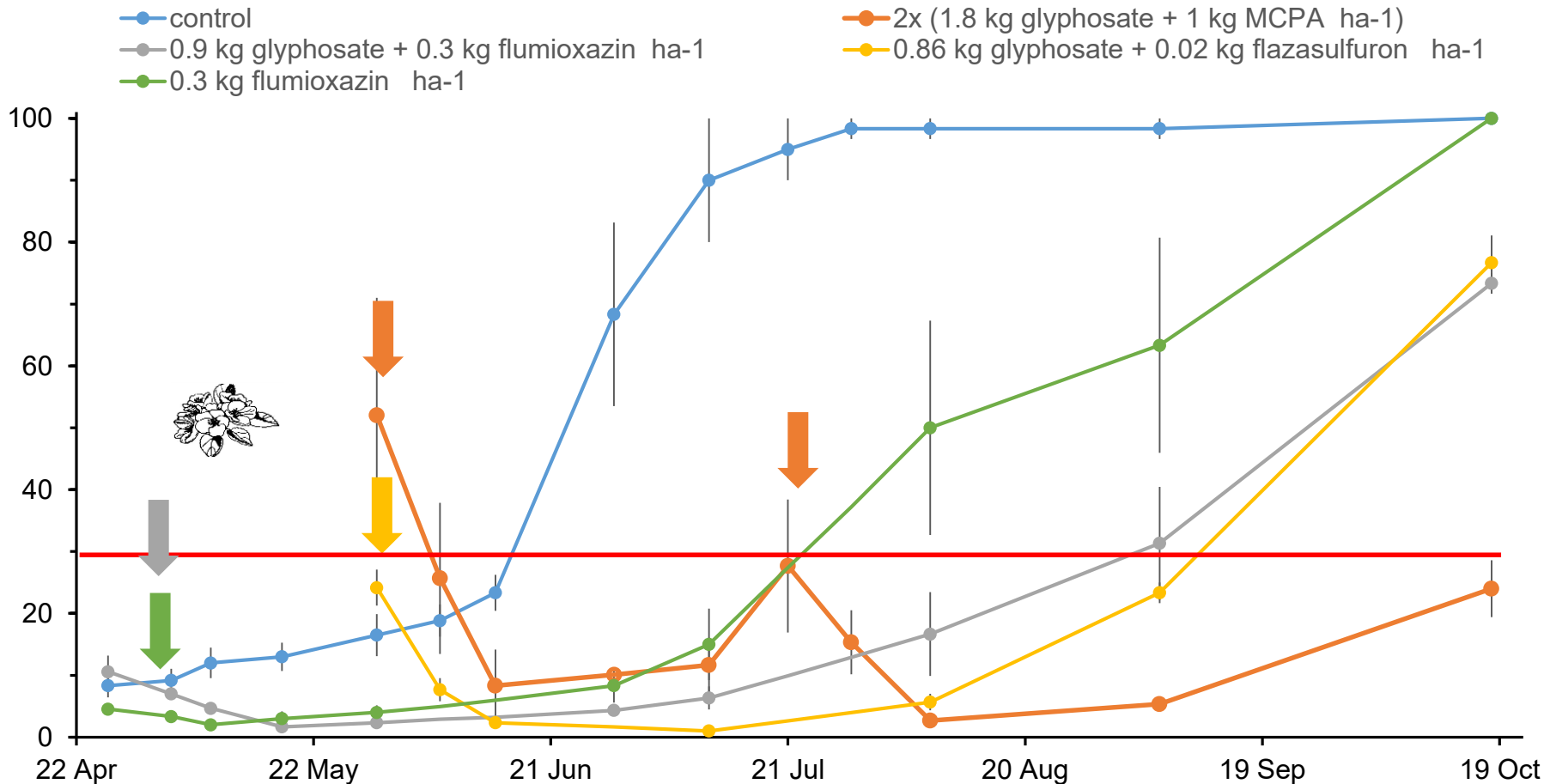
Insufficient weed control with pelargonic acid



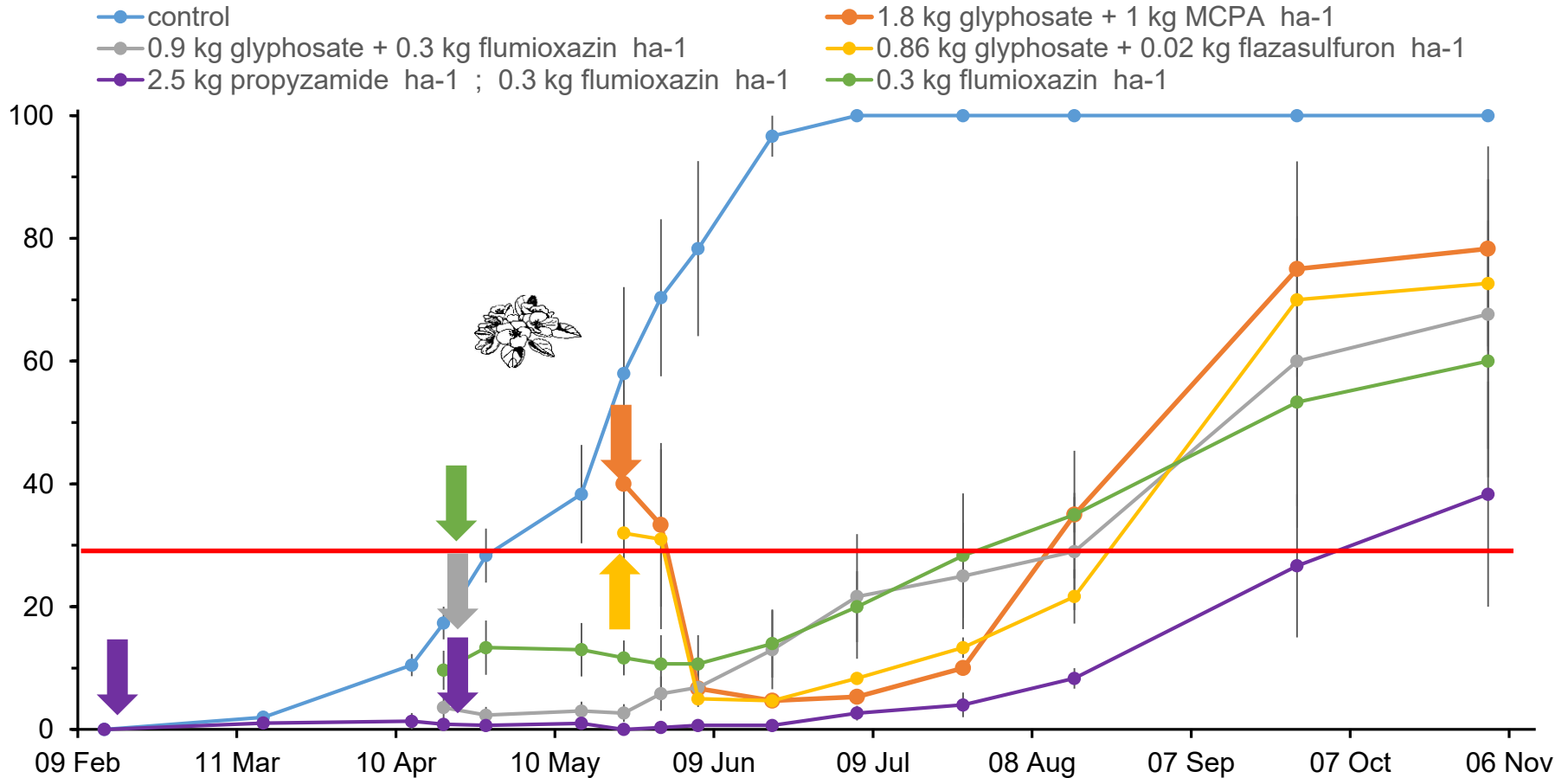
Sufficient weed control: pelargonic acid + residual herbicide



Chemical alternatives to glyphosate 2016



Chemical alternatives to glyphosate 2017



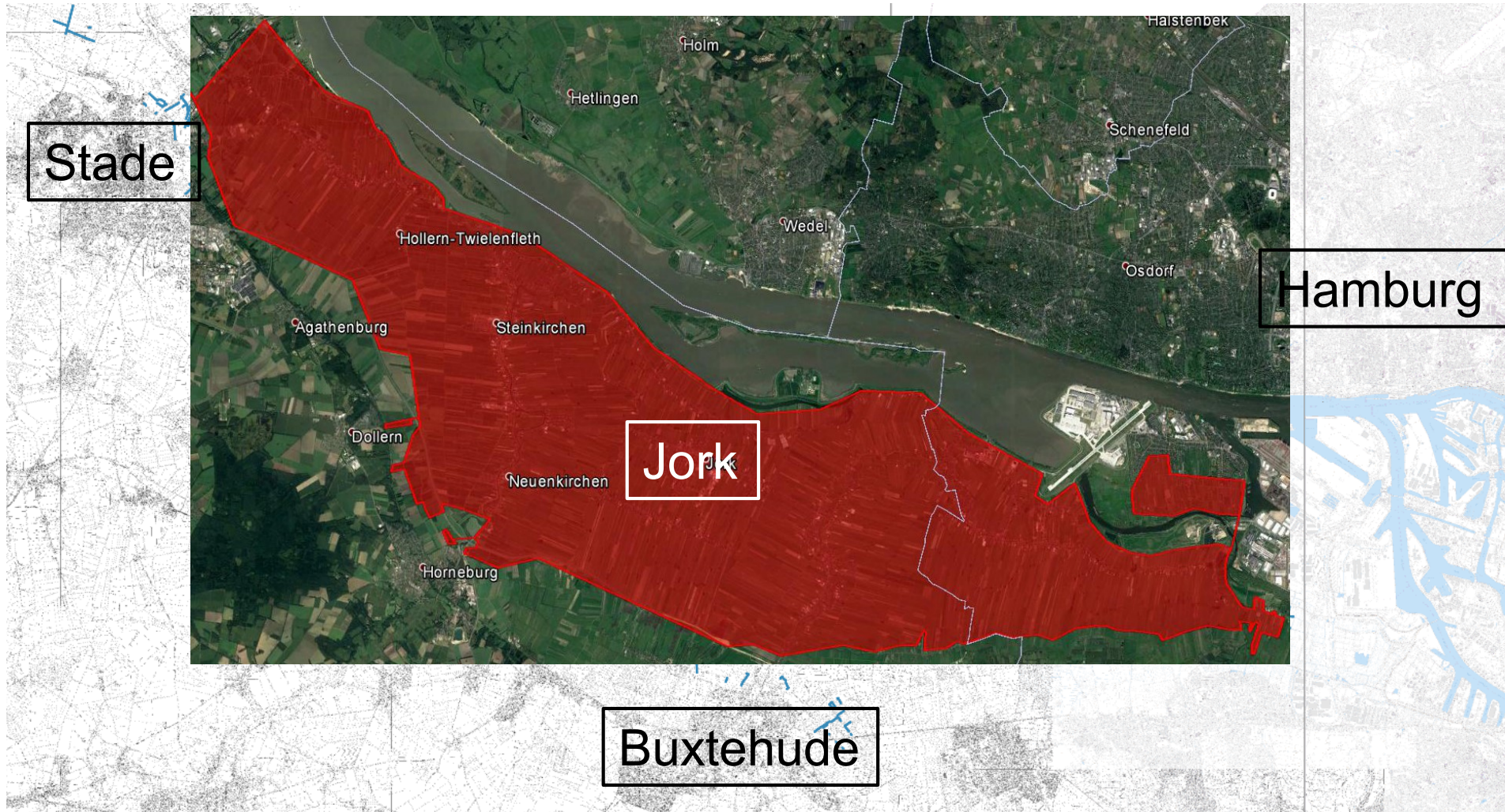
Conclusion

- Weed control without glyphosate and glufosinate will be more challenging – at least more expensive
- Combination of pelargonic acid and residual herbicides look promising
- Mechanical weed control like in organic production will bring also the problems to integrated production and maybe pushes growers to organic production

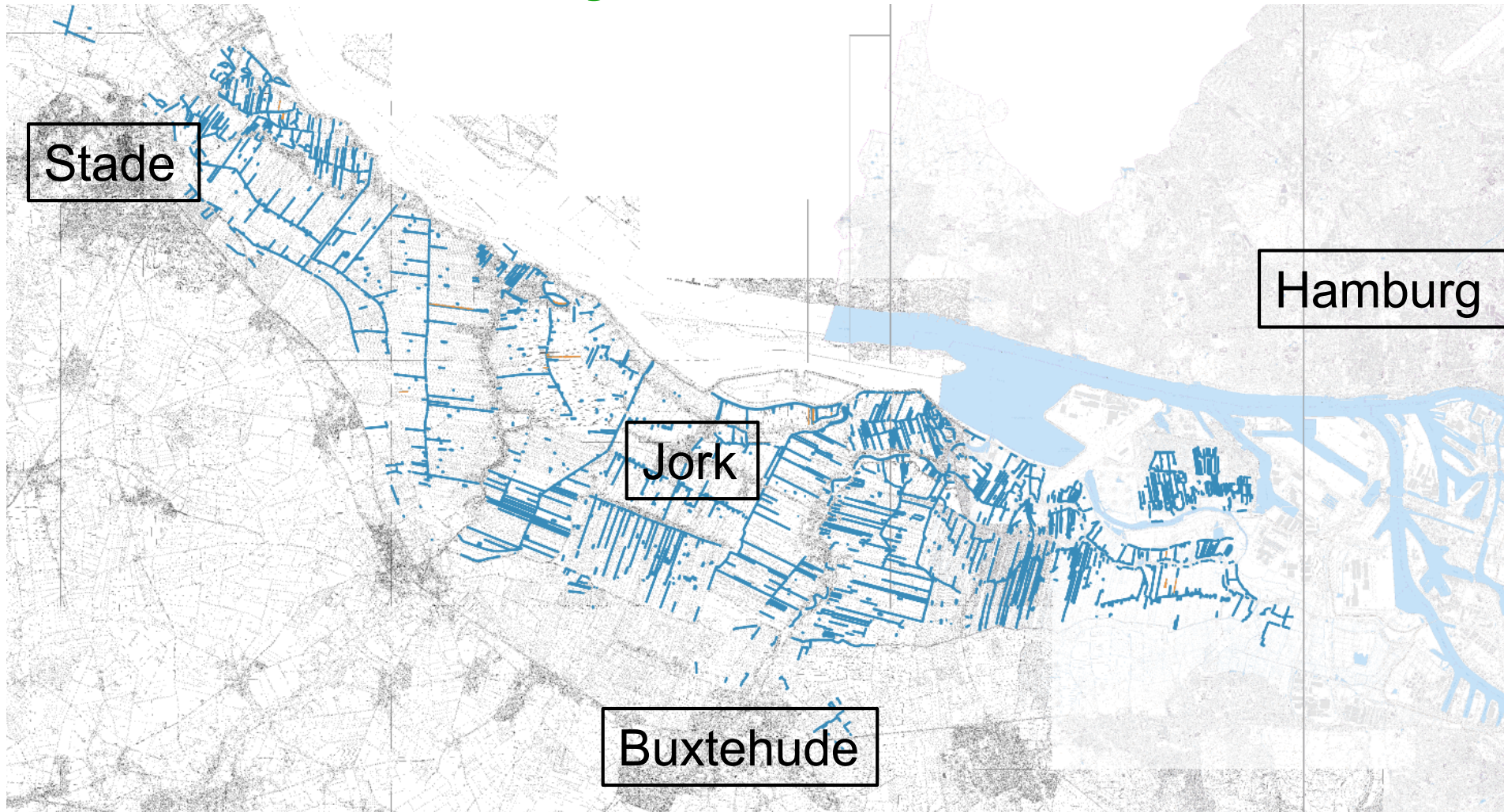


2. Alternative orchard spray technique (tunnel technique) to reduce pesticide use and prevent drift

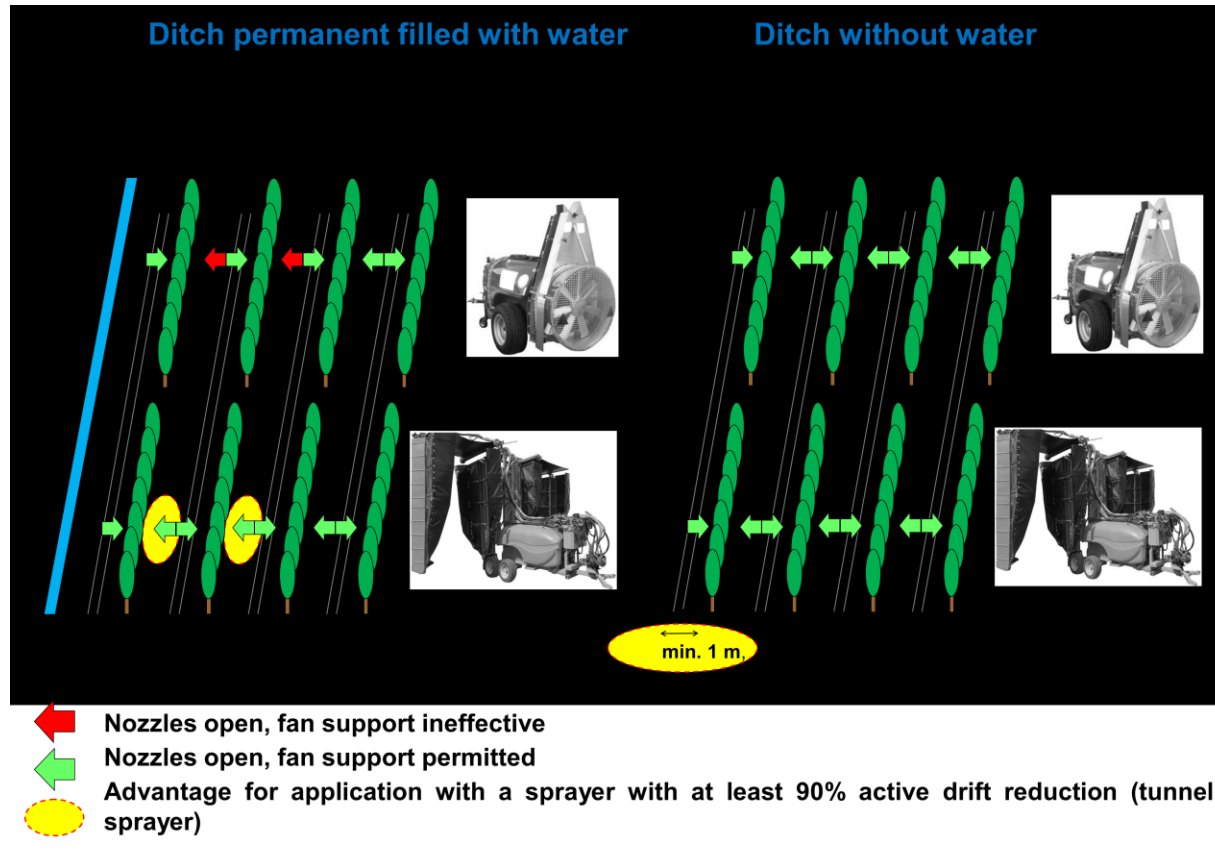
Fruit production in the Altes Land



Water density in the Altes Land



Restrictions in application technology in the special area Altes Land



Double-row reflector sprayer Wanner NTR 20



Double-row tunnel sprayer LIPCO OSG-NVM 2



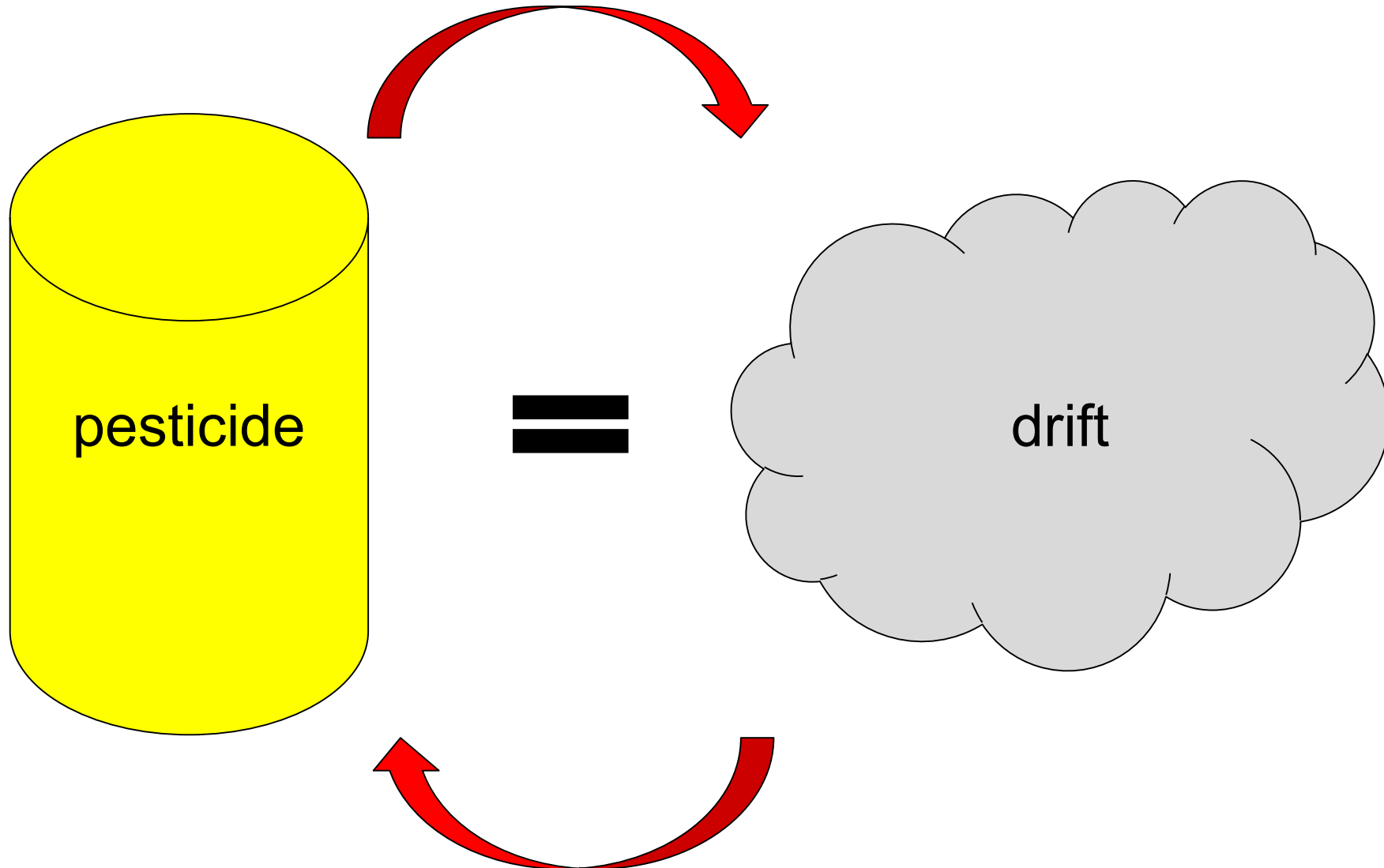
Drift of pesticides in orchards

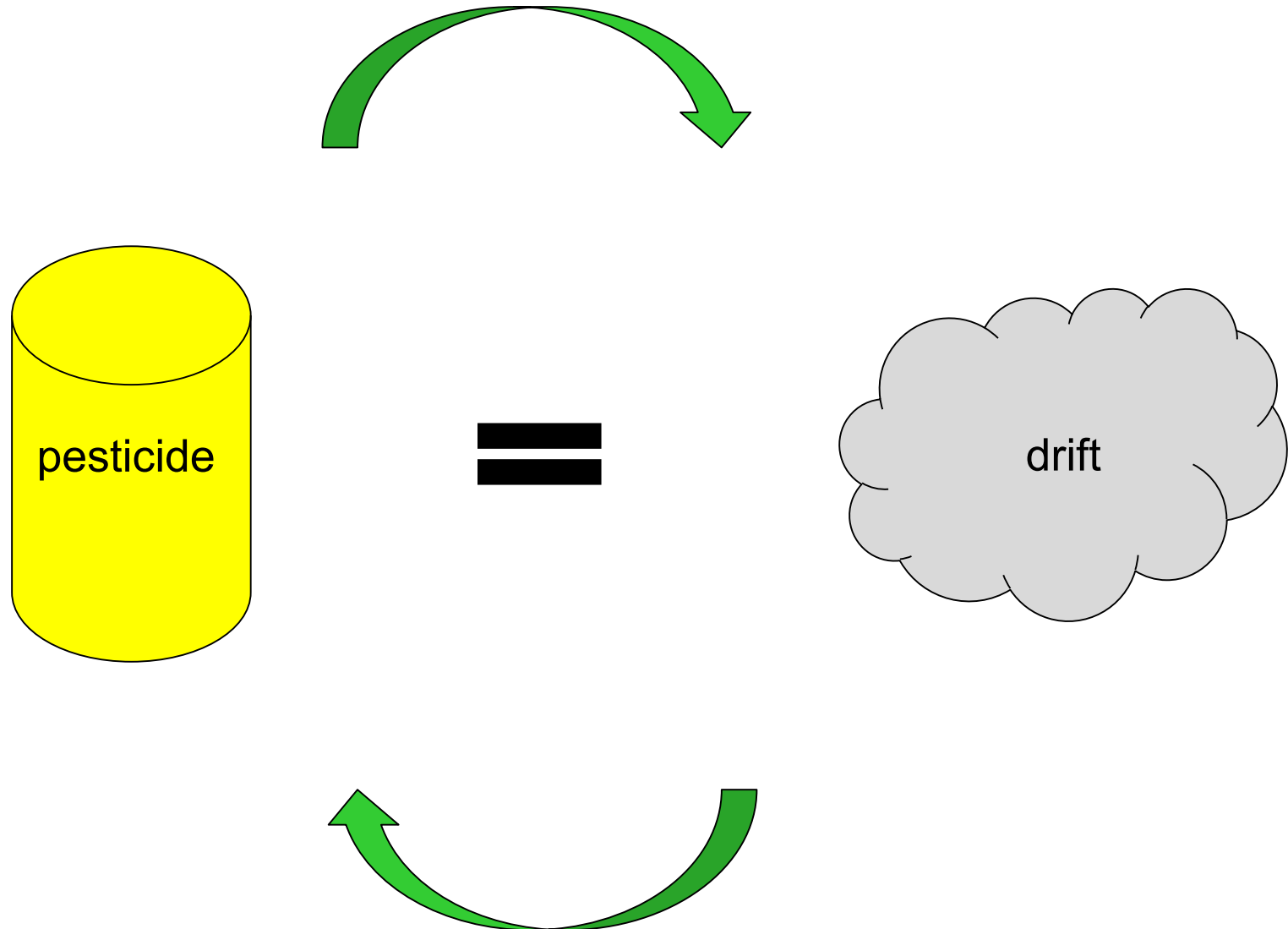


before 2000

since 2000

2020





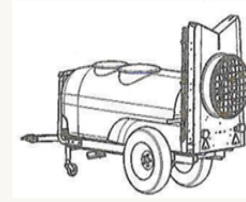
Comparison of tunnel sprayer against axial fan sprayer

- + Pesticide saving (reduction) up to 20 % due to recycling technique
- + Application of two rows the same time
→ performance + 30 %
- Maximum tree height 3.7 m
- Maximum row spacing 3.7 m
- Not usable together with hail nets or roofs
- longer set-up and cleaning times
- More difficult operation

Leaf covering measurement



Height range of the detached leaves (above ground)



Bildquelle: www.obstwein-technik.eu



Top
> 1.6 m - 2 m

7.0 %

22.9 %

Middle
> 1.2 m - 1.6 m

8.0 %

21.1 %

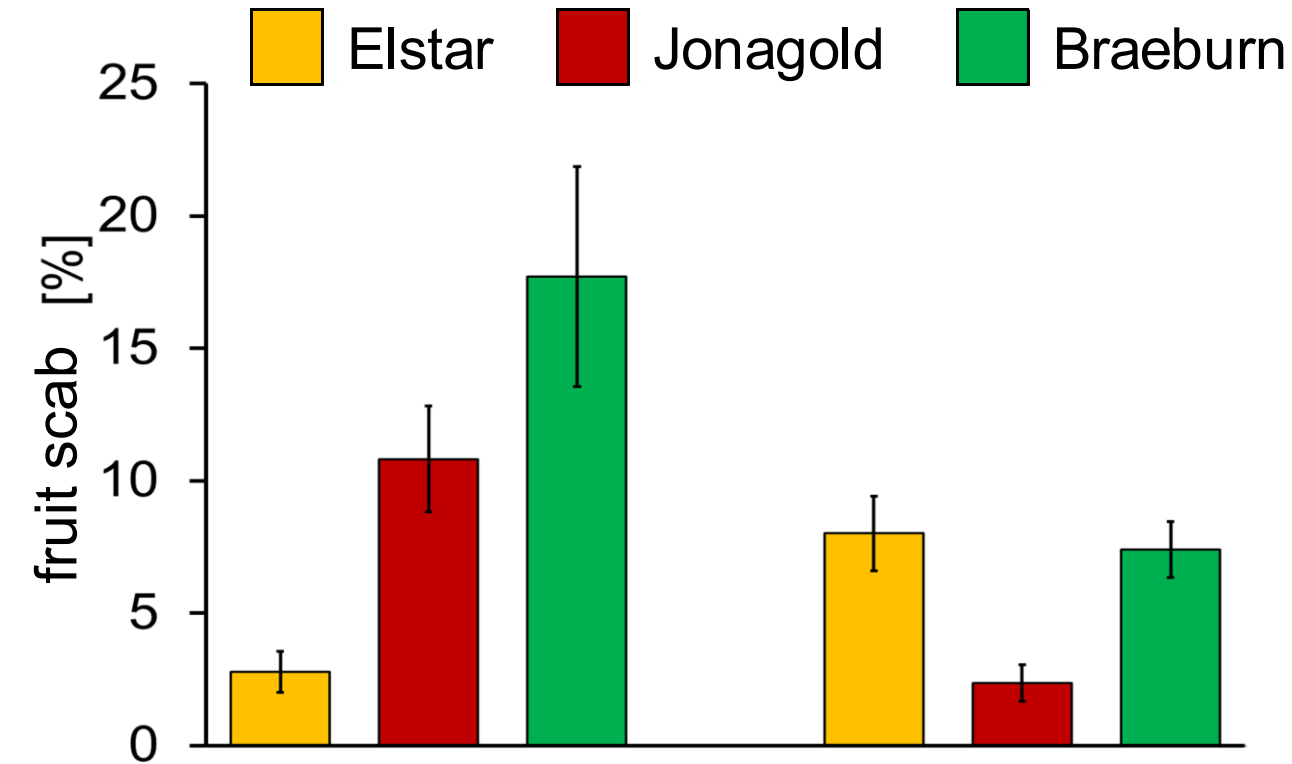
Below
0.8 m - 1.2 m

7.2 %

16.3 %

→ Application with tunnel sprayer resulted in increased leaf covering

Biological efficacy against apple scab in practice 2015



Conclusion

- Significant pesticide saving and drift reduction
- Properties of tunnel sprayer technique need more investigation
- Technique can only be used in areas without hail nets / rain roofs
- Reservations of growers against technique must be overcome

