



Control of European Corn Borer (*Ostrinia nubilalis*) with chemical and biological methods including drones 2013 - 2019

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NoTill into straw residues corn 2013



Larva cornborer
Ostrinia nubilalis



Pattern of damage



Grubs on the cobs



Fusarium – infestation on the lesion

Pattern of damage

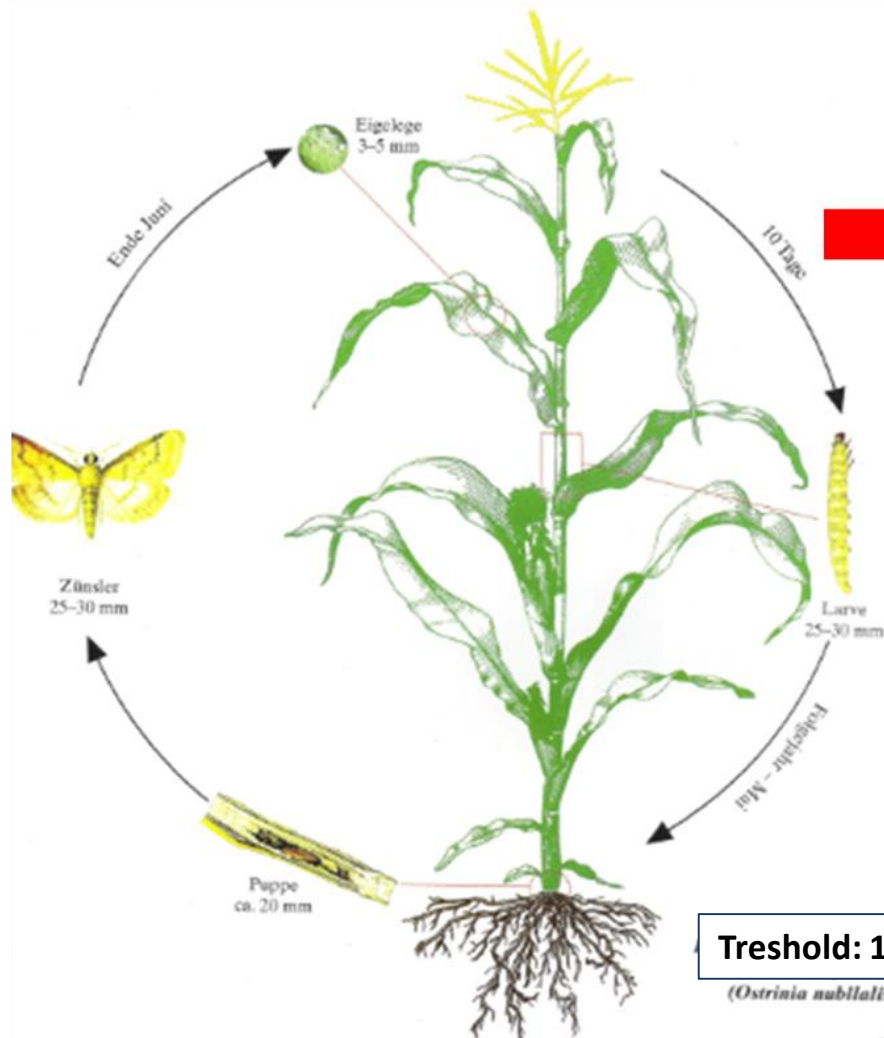


drillhole

**Lodging of cornplants
Harvest loss**



Chemical and biological control - Time window of application



**Time window
of application**



Threshold: 10 – 15 clutch of eggs per 100 plants

(Ostrinia nubilalis)

(Hurle et al., 2005)

Options of control

- **Mechanical**
 - Shred straw residues after harvest + compound into soil
- **Biological control**
 - Parasitic wasps – *Trichogramma evanescens*
 - *Bacillus thuringiensis*
- **GMO**
 - Bt-Mais
- **Chemical control**
 - Coragen.....Chlorantraniliprole
 - Decis Forte.....Deltamethrin



**high boom crop sprayer field trials to control
European Corn Borer middle of July**



Biological Control with Drones



Inside the maize-starch – capsule are ~ 1000
Trichogramma larvae parasitizing flour worms with
possibility to accrete
2 applications within 2 weeks
100 capsules/ha 2 times



Experimental sites Tulln and Pyhra 2013 – 2017

Tulln & Ernstbrunn Dry – semiarid climatic conditions

11°C average temperature

Ø 500 - 600 mm precipitation/year

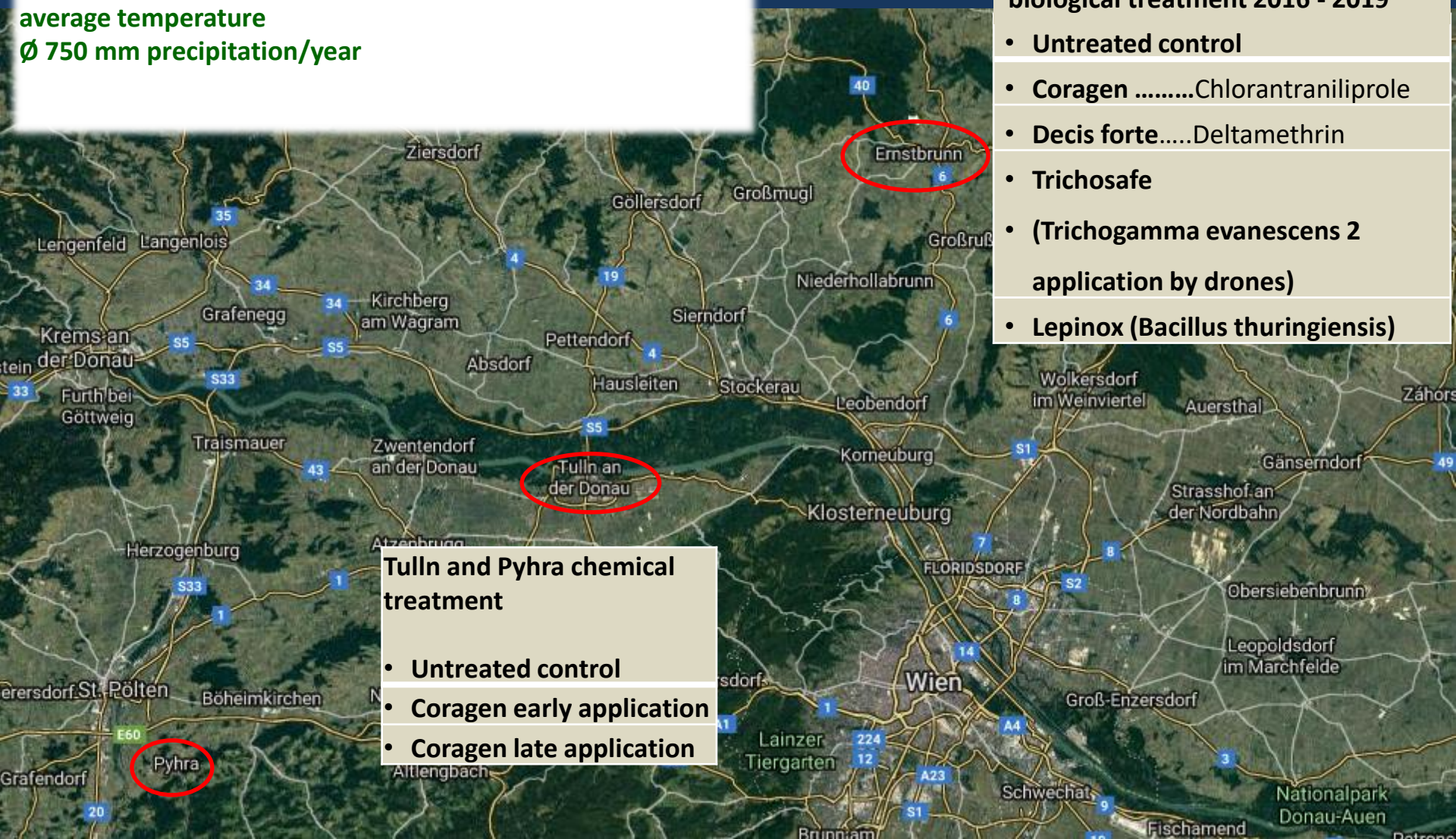
Pyhra: moderate wet - semihumid climatic conditions, 10°C

average temperature

Ø 750 mm precipitation/year

Ernstbrunn – chemical and biological treatment 2016 - 2019

- Untreated control
- CoragenChlorantraniliprole
- Decis forte.....Deltamethrin
- Trichosafe
- (Trichogamma evanescens 2 application by drones)
- Lepinox (Bacillus thuringiensis)



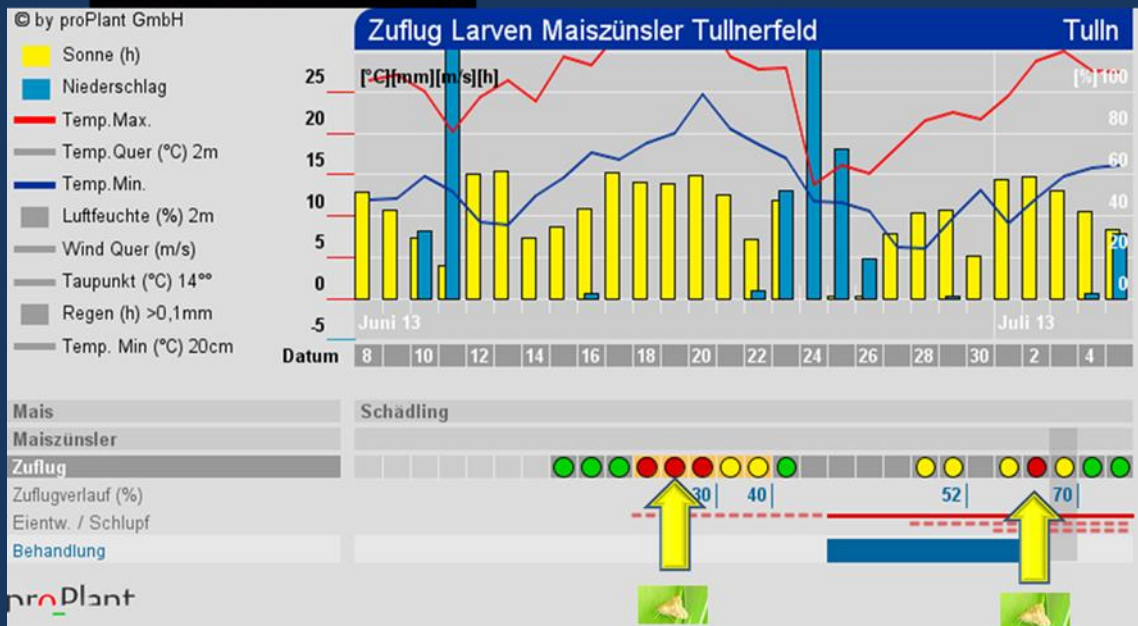
Tulln and Pyhra chemical treatment

- Untreated control
- Coragen early application
- Coragen late application

**UV Corn Borer Trap
With solar panels**



**Net inside to catch the insects &
insecticide stripe**

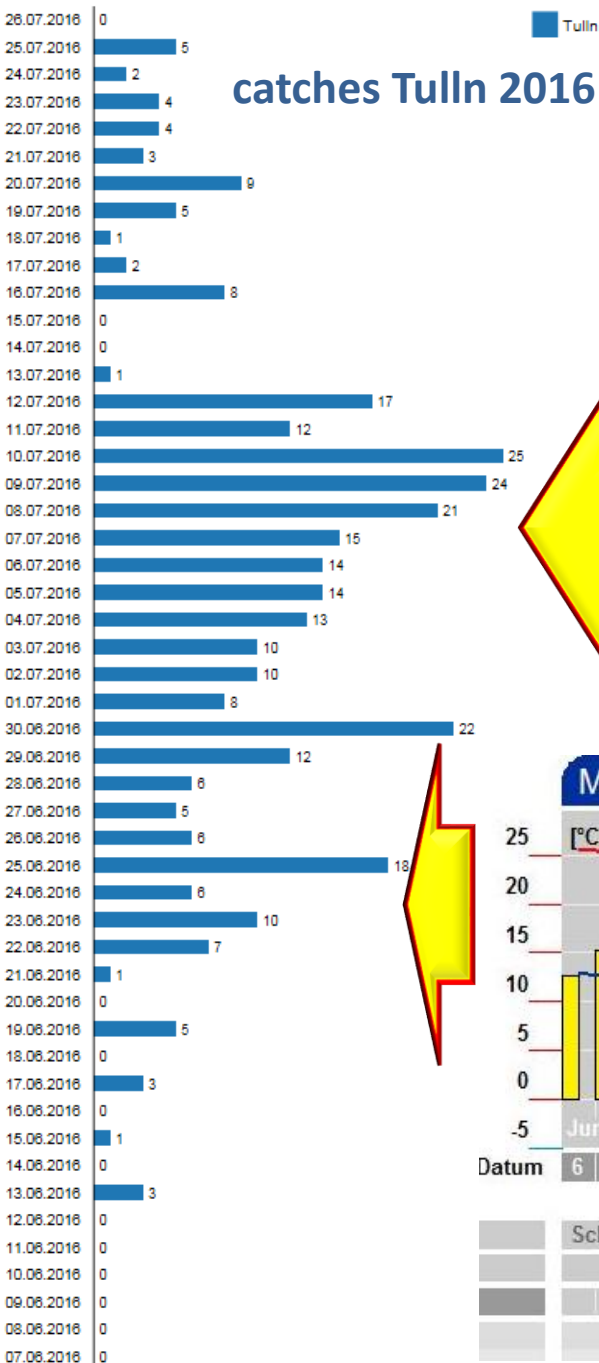


proPlant Expert
prediction corresponds
accetable with trap
catches



Proplant forecast 2013 for cornborer

Intensivierungsversuche Land NO 2013



Details zum Schädling

**AGES
prediction**

Schädling

Maizsünsler

Regionen

Österreich

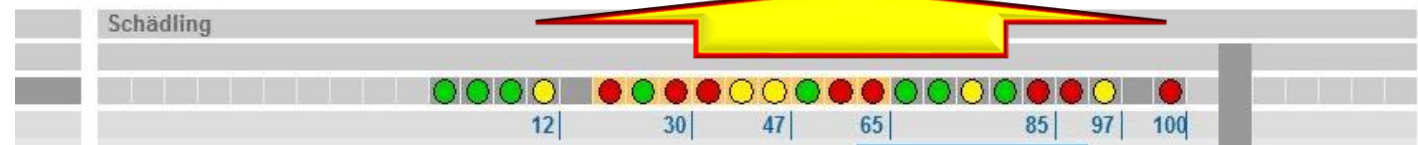
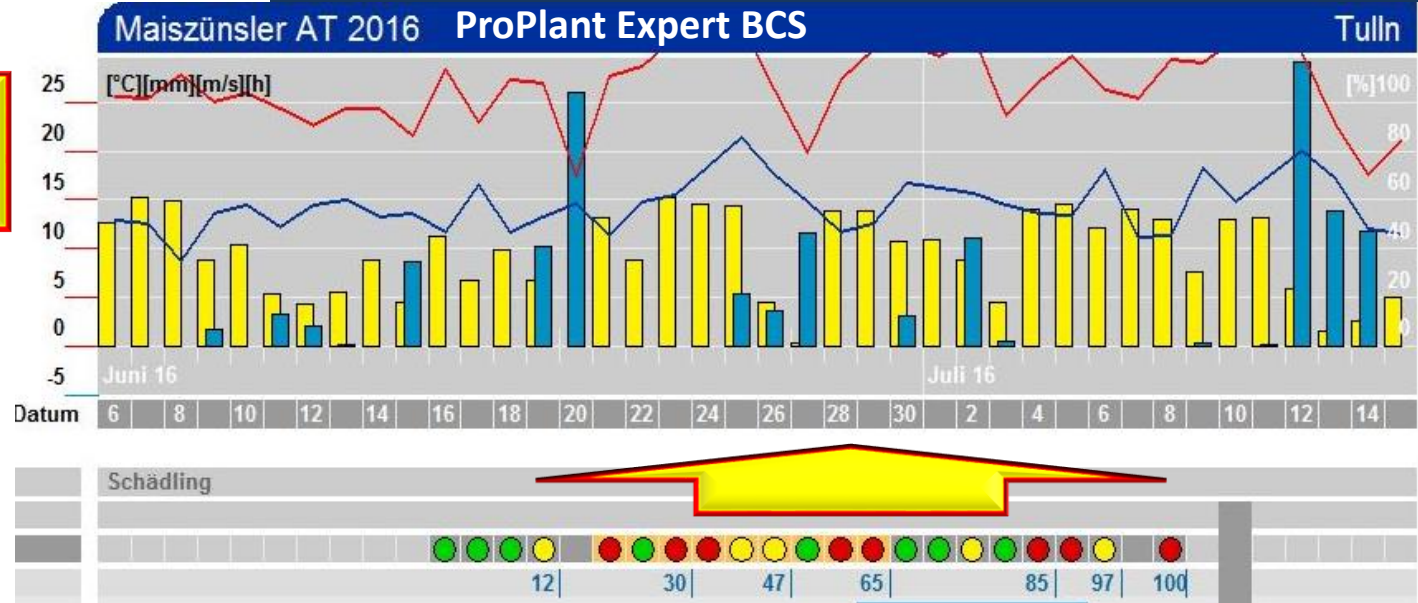
Zeitraum

04.07.2016 - 28.07.2016

Aufgrund der warmen Witterung der letzten Tage haben die bereits fliegenden **Maizsünsler** ihre Eier verstärkt abgelegt. Bei den derzeit herrschenden sommerlichen Temperaturen ist mit einem Schlupf der Larven in den nächsten Tagen zu rechnen. Der optimale Anwendungszeitpunkt liegt in der 27. Kalenderwoche. Um das Einbohren der Larven in die Maispflanzen zu verhindern, sollte nun die Bekämpfung mit einem Pflanzenschutzmittel vorgenommen werden. Die für diesen Zweck zugelassenen Präparate können dem Amtlichen Pflanzenschutzmittel-Register entnommen werden.

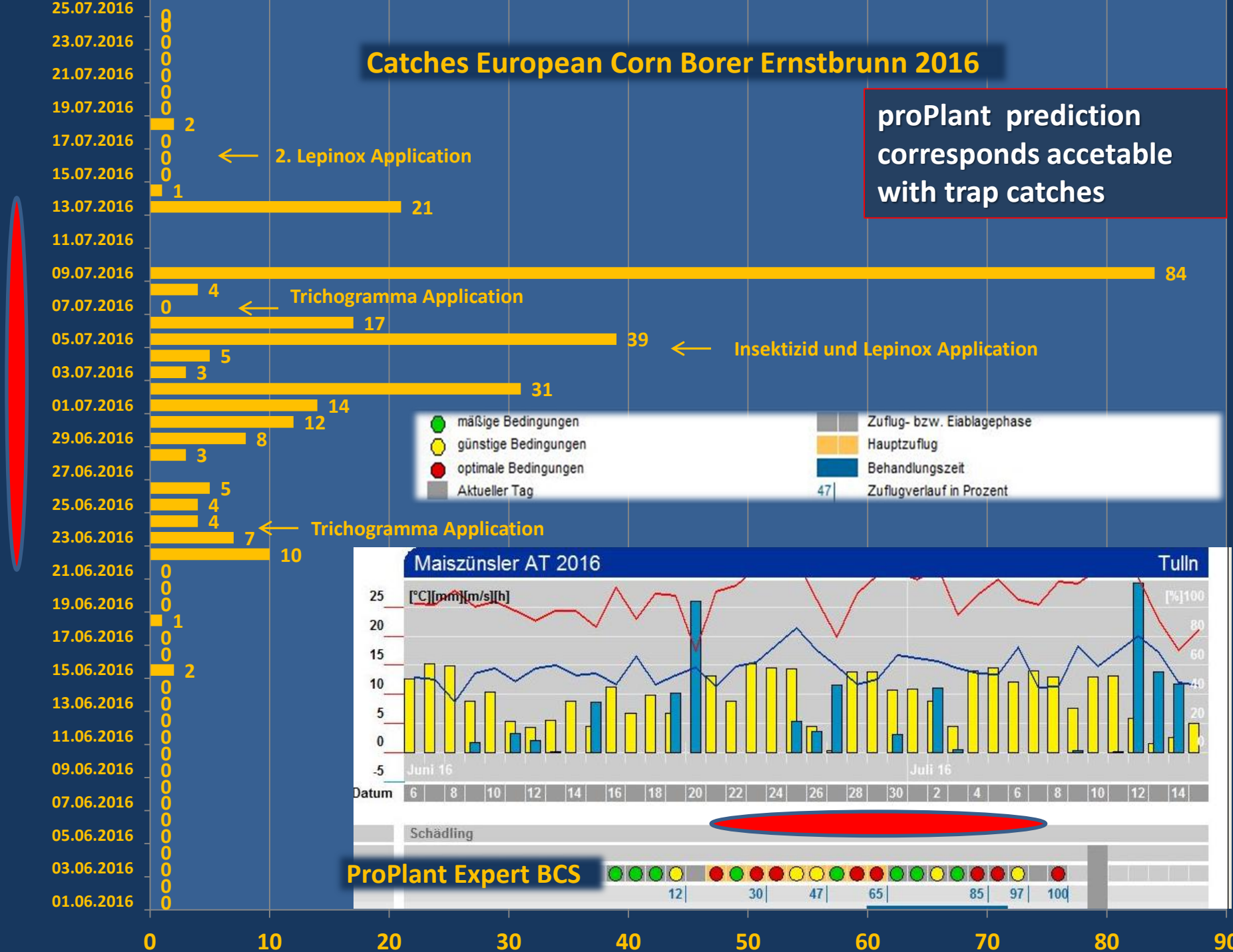
proPlant prediction corresponds acceptable with trap catches

- mäßige Bedingungen
- günstige Bedingungen
- optimale Bedingungen
- Aktueller Tag
- Zuflug- bzw. Eiablagephase
- Hauptzuflug
- Behandlungszeit
- 47 Zuflugverlauf in Prozent

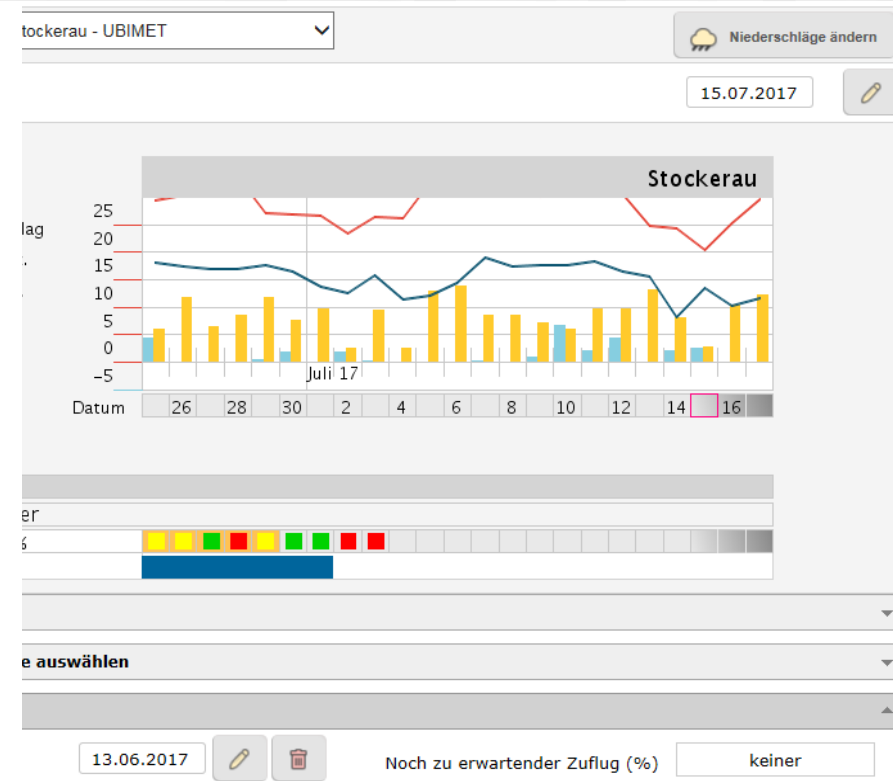
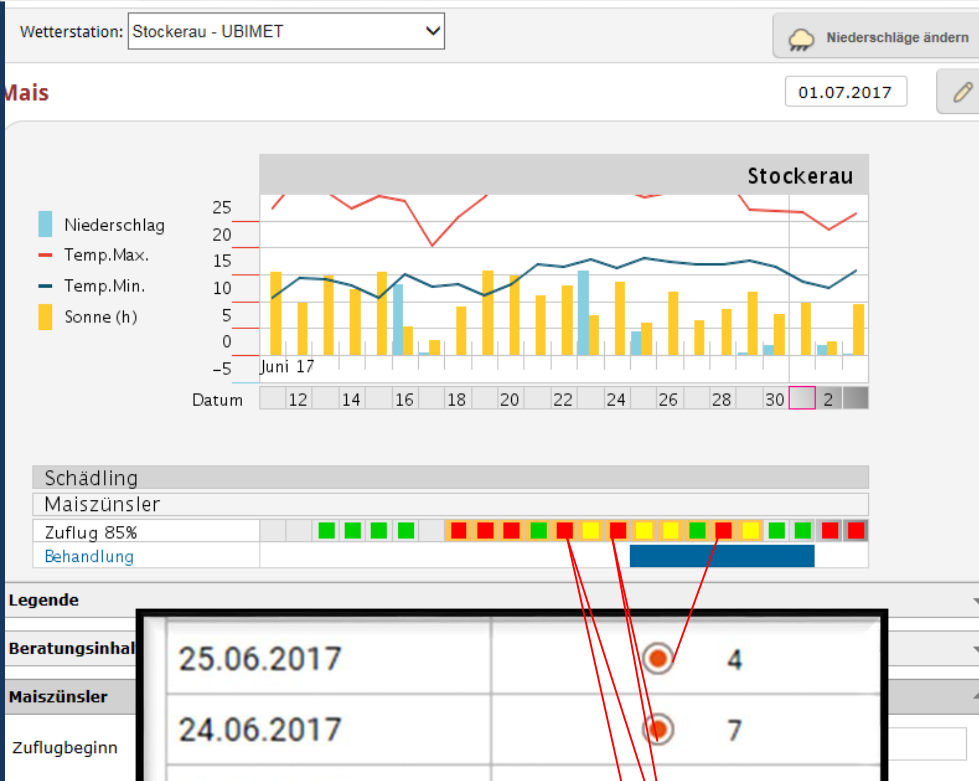


Catches European Corn Borer Ernstbrunn 2016

proPlant prediction
corresponds accetable
with trap catches



proPlant Expert 2017 Stockerau: 25 km south Ernstbrunn



25.06.2017	4
24.06.2017	7
23.06.2017	41
22.06.2017	35
21.06.2017	27

Trap catches Ernstbrunn 2017

Prediction and trap catches accord 2017 again

Corn borer Prediction 2019

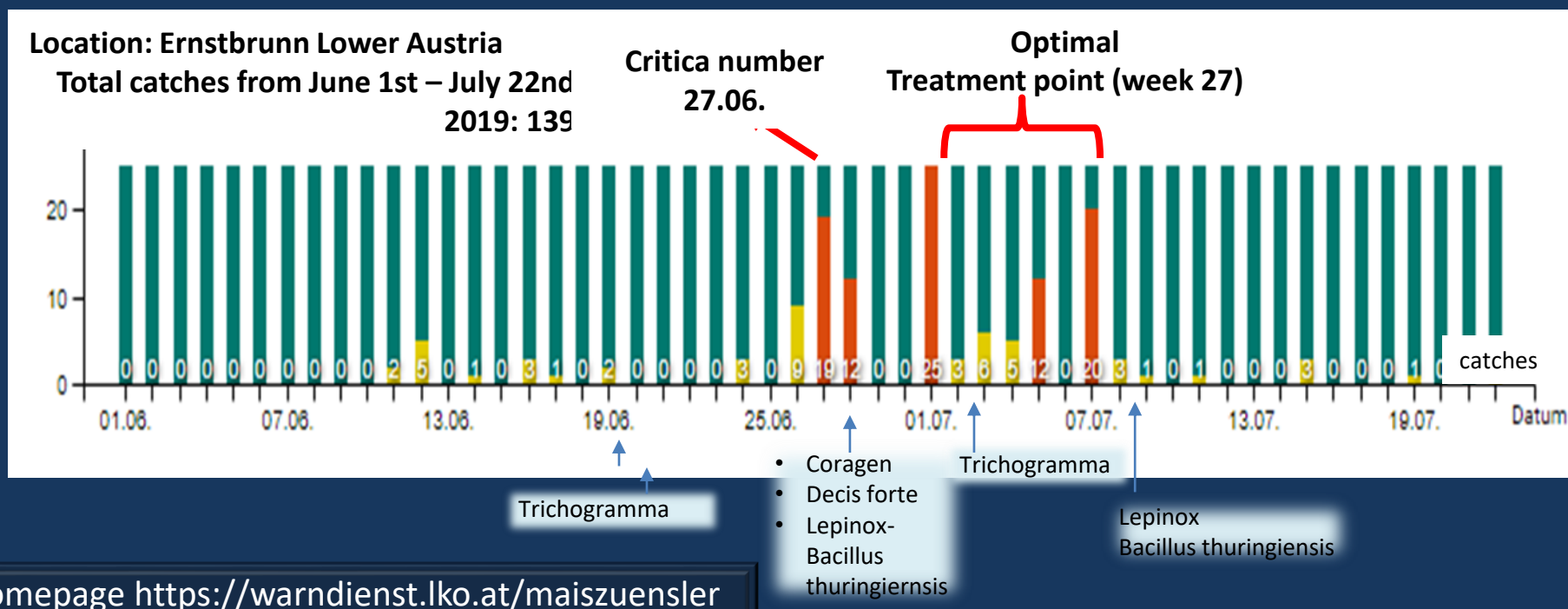


- Detection of the optimal treatment point with UV – trap
- More than 10 moths – critical point achieved
- Treatment 7 – 10 days after critical point



male

female



catches cornborer Ernstbrunn 2019



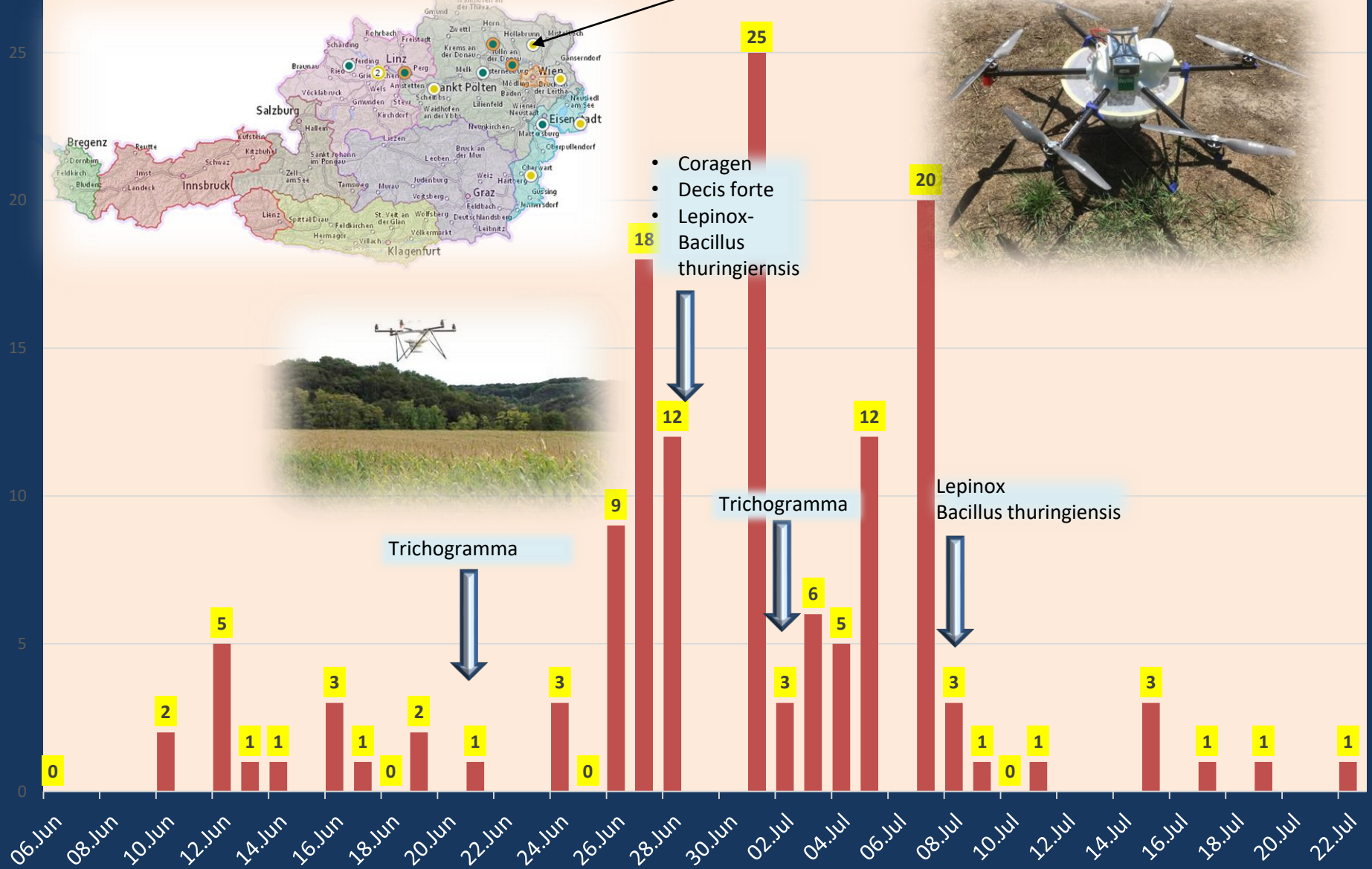
- Coragen
- Decis forte
- Lepinox-
Bacillus
thuringiensis



Trichogramma

Trichogramma

Lepinox
Bacillus thuringiensis



2016 stem breaking in the application rows

NO Breaking 2017, 2018, 2019

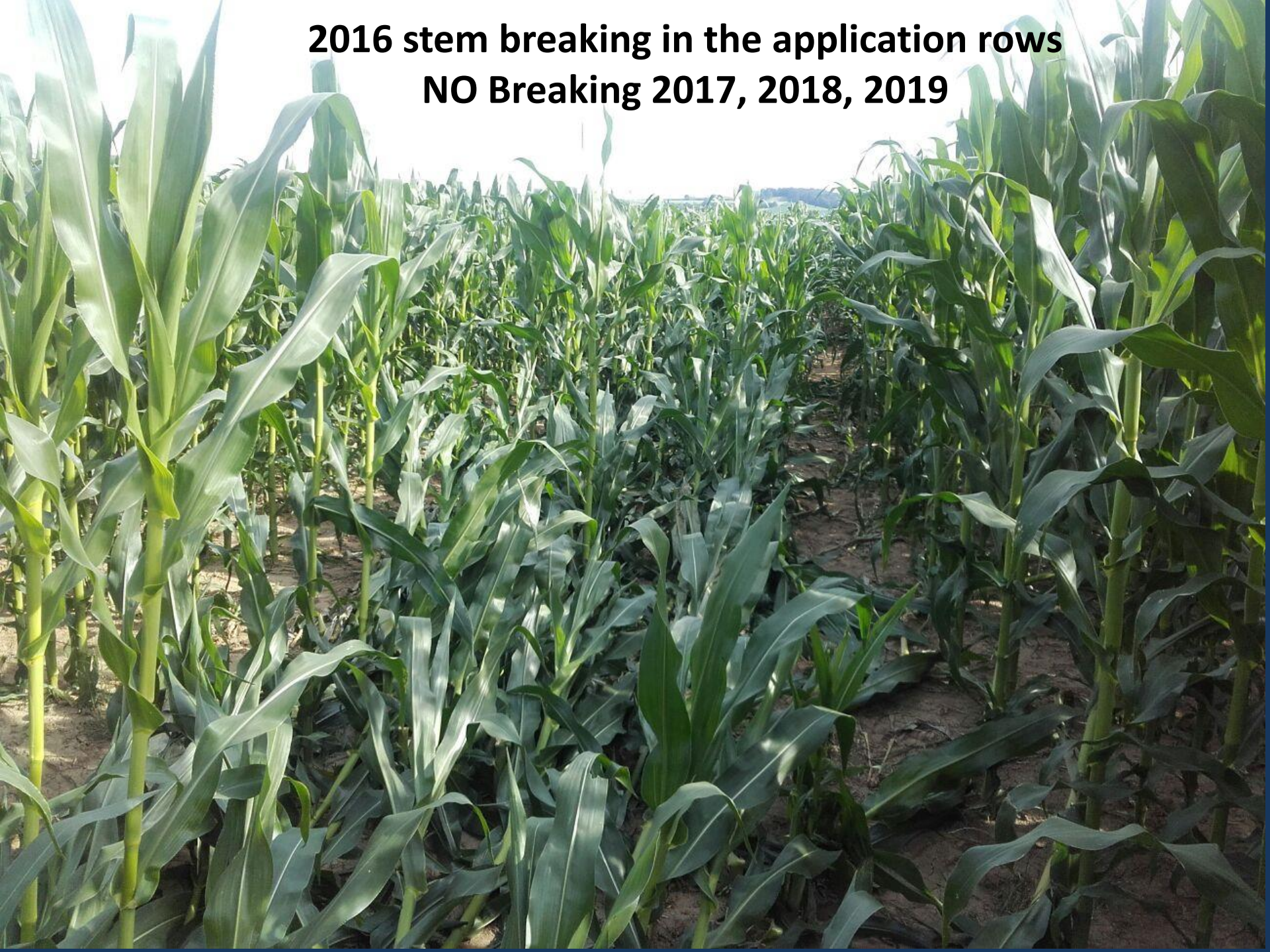




**2016 stem breaking in the
application rows**



2016 stem breaking in the application rows
NO Breaking 2017, 2018, 2019



Ernstbrunn 2016

■ yield loss % 2 rows machine track 2 applications

■ yield loss % 2 rows machine track 1 application

15 m

4,8

2,6

Boom
width

2,4

30 m

1,3

0

1

2

3

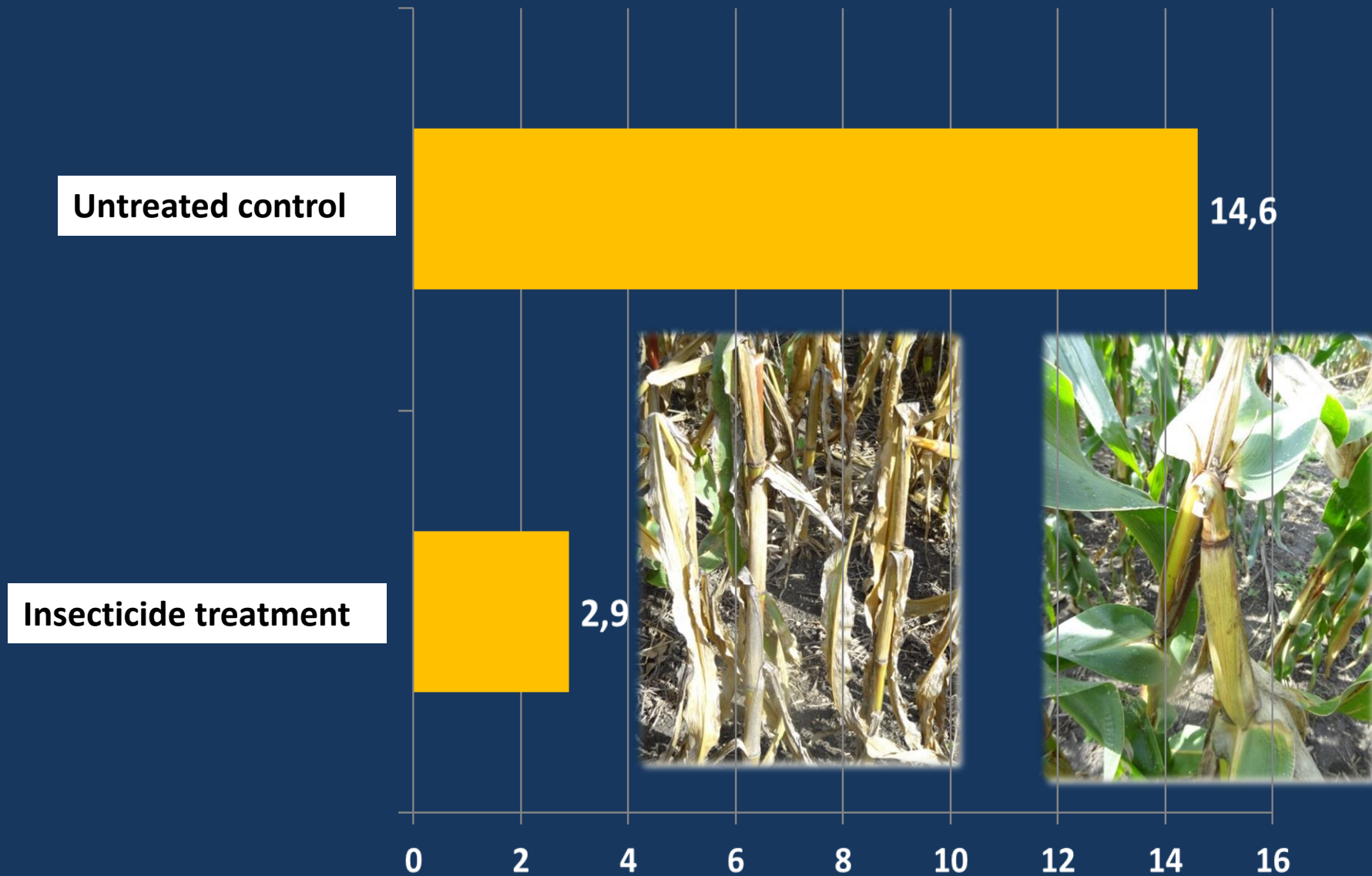
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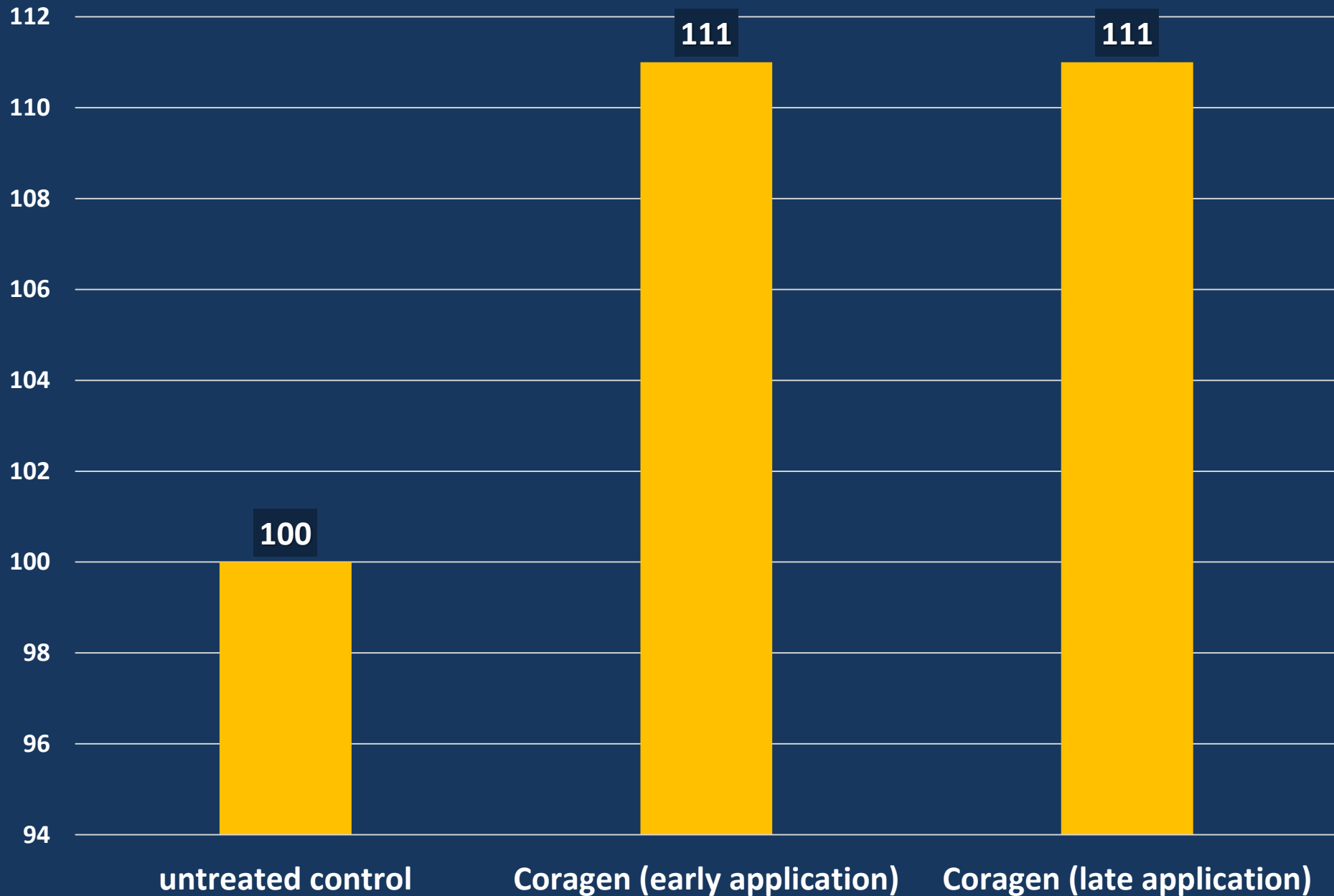
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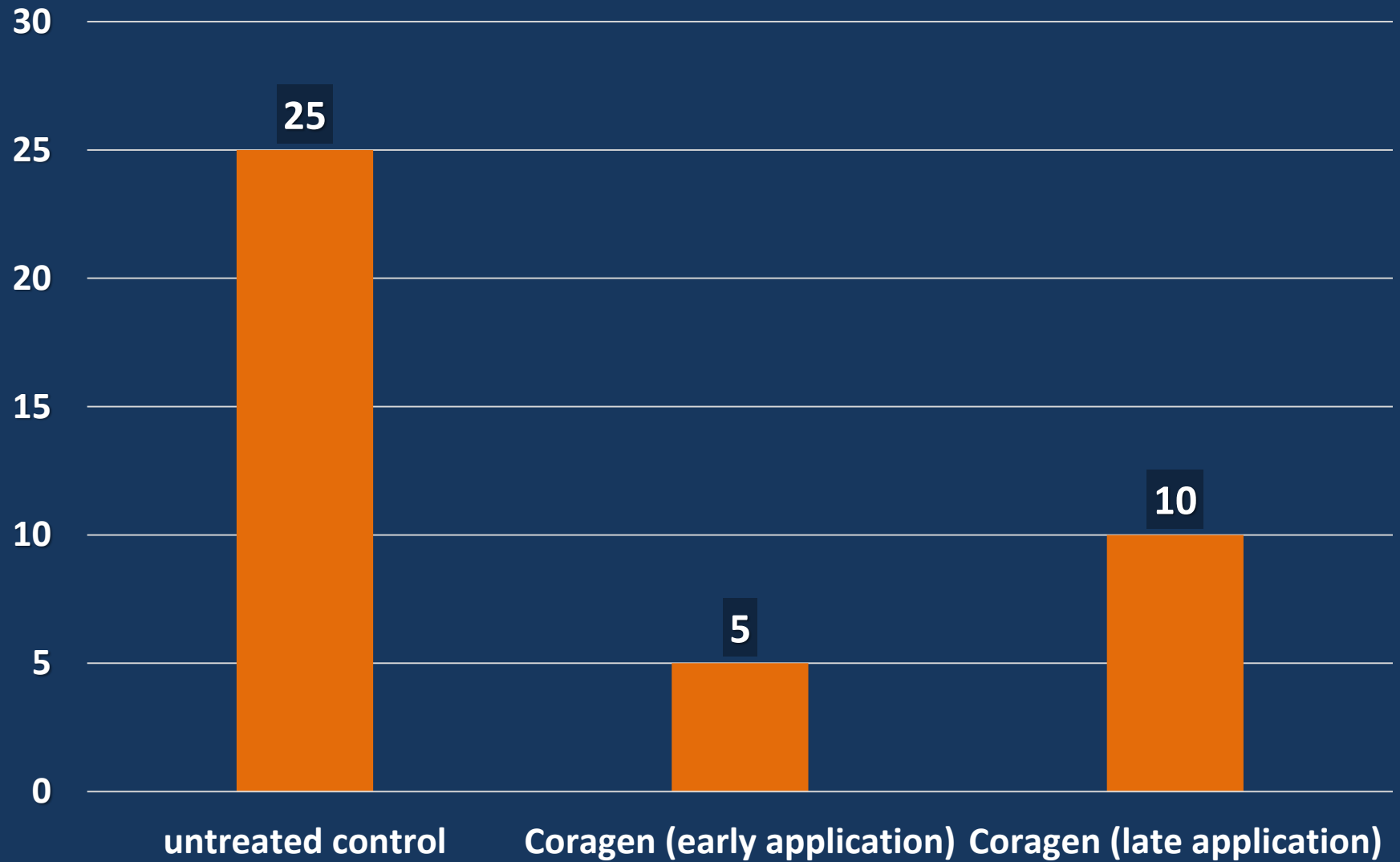
stem breaking under corn cob Pyhra 2013 - 2017



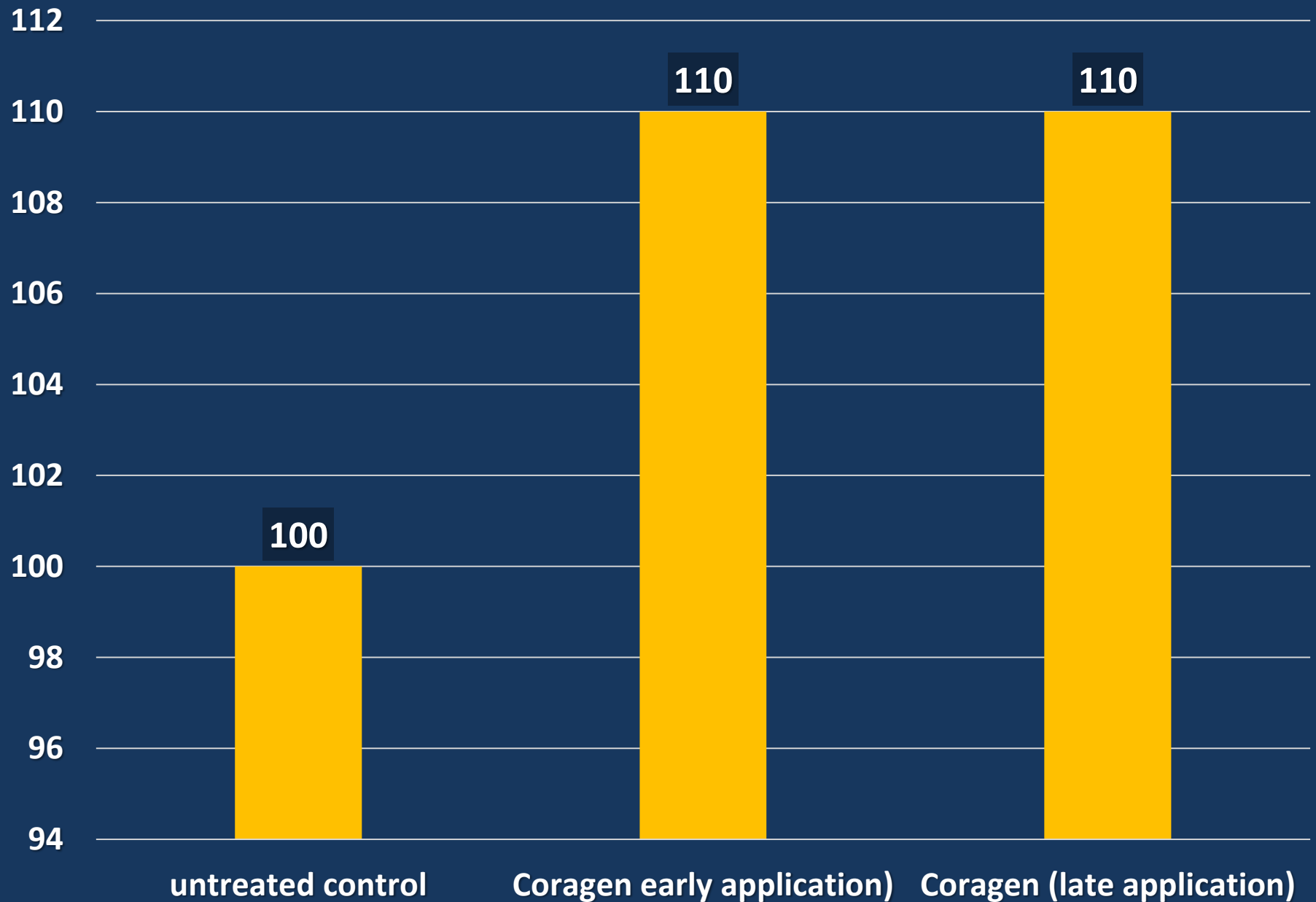
Pyhra 2013 - 2017 yield % untreated control



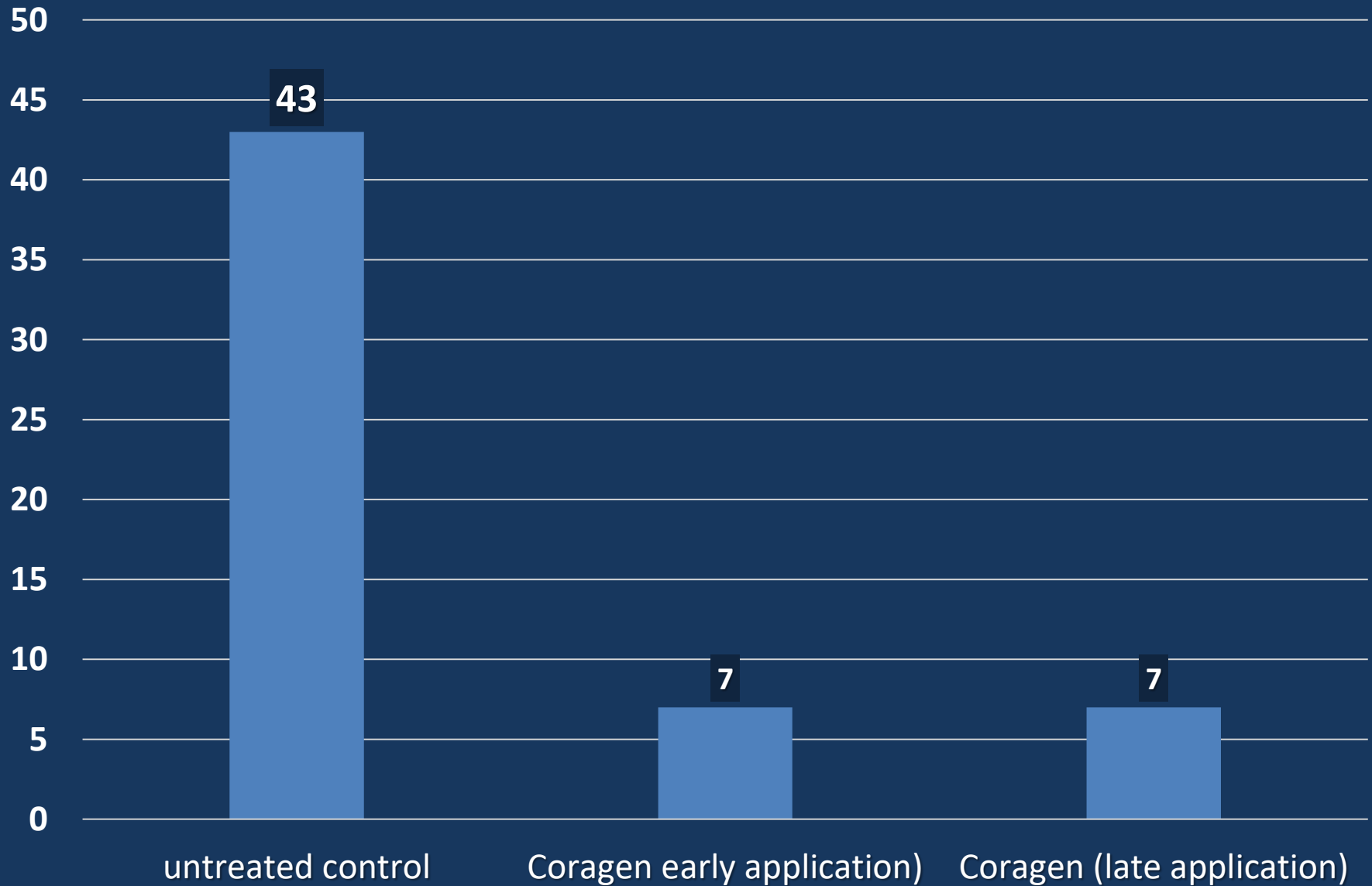
% infested plants Pyhra 2013 - 2017



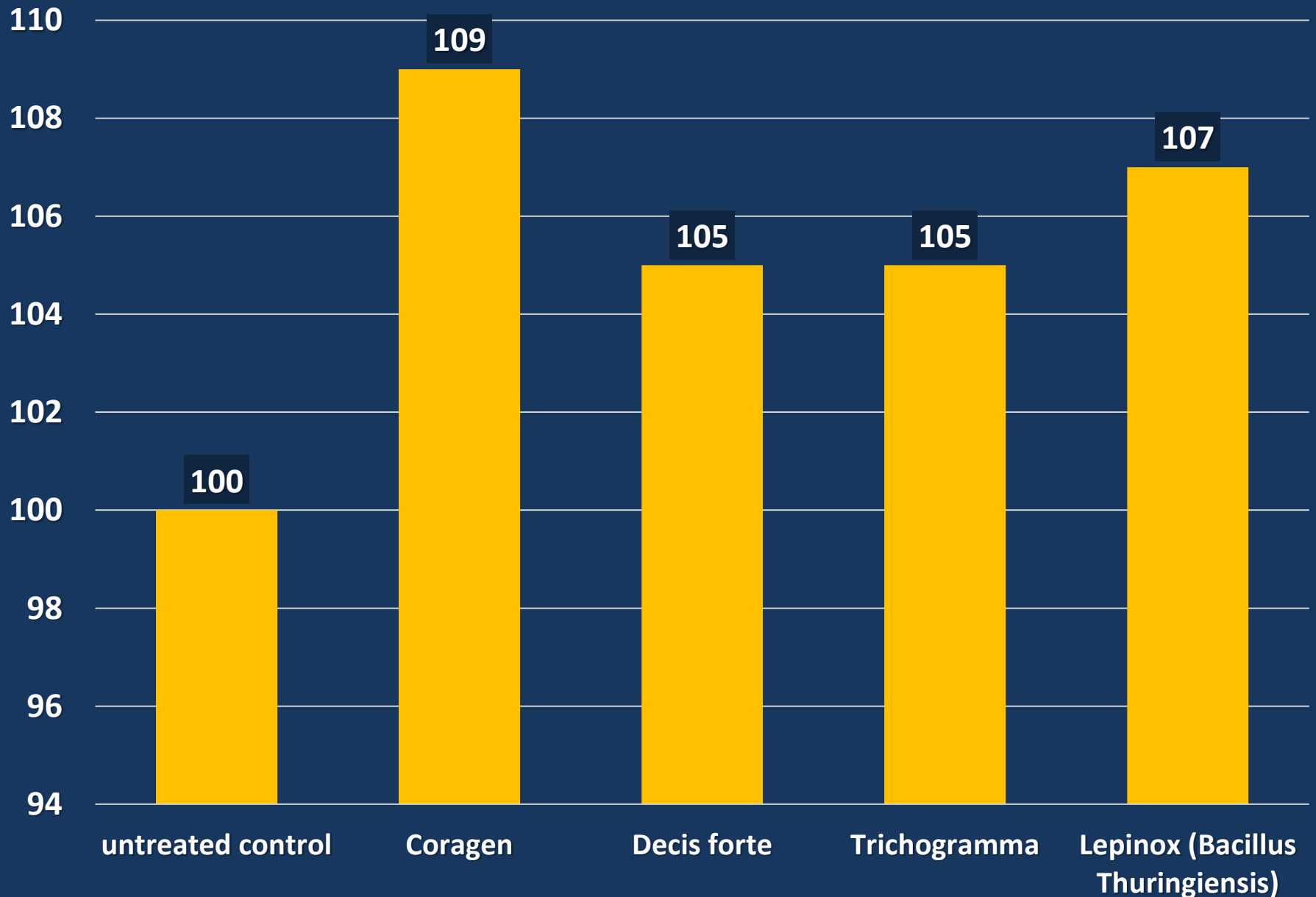
Tulln 2013 - 2017 yield % unterated control



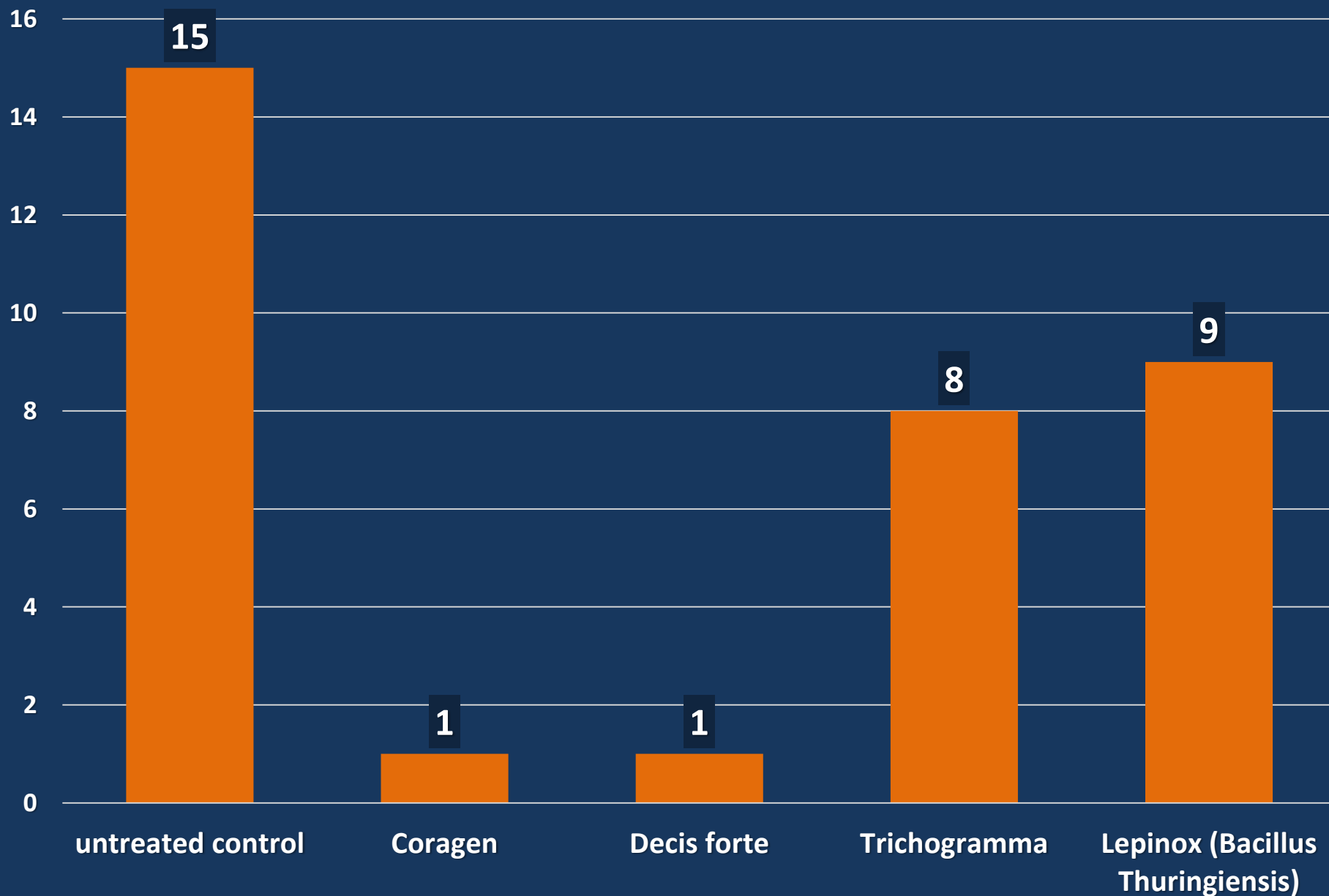
% infested plants Tulln 2013 - 2017



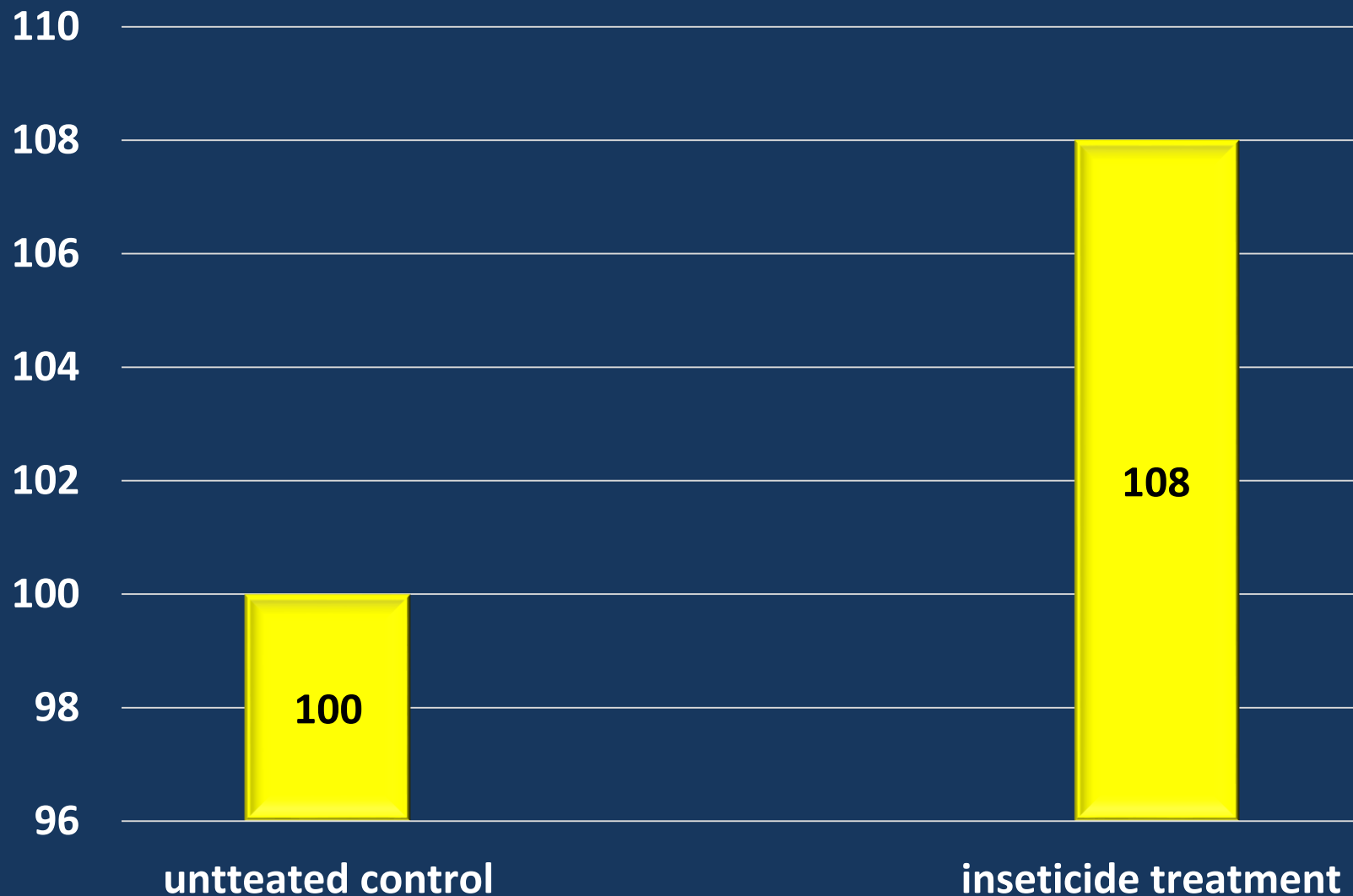
Ernstbrunn 2016 - 2019 yield % untreated control



% infested plants Ernstbrunn 2016 -2019



Yield % control (100%) Trials control of European cornborer 3 locations 2013 - 2019



Summary

- Control of European Corn Borer seems successful and is important for validation of quantity and quality of maize
- Multi year trials in dry Pannonian and semihumid climate show significant increase of yield by control of European Corn Borer
- chemical and non chemical control were equal
- Pro Plant Expert prediction corresponds acceptable with trap catches and is a practical tool for IPM
- Maize is an important commodity for feed, processing industry (maize starch, bioethanol, citric acid, Xanthan) and will have gain in importance
- **Thank you for your attention !**



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