

**Kupferreduktion
durch Einsatz des
Hefestammes 2H13**

**Copper reduction
by using the
yeast strain 2H13**

im Rahmen des Forschungsprojektes

**Einsatz von Mikroorganismen zur Kupferreduktion bei
der Bekämpfung von Kraut und Knollenfäule und
falschen Mehлтаupilzen (Oomyceten) im ökologischen
Landbau**

Fördernummer:33466/01 DBU

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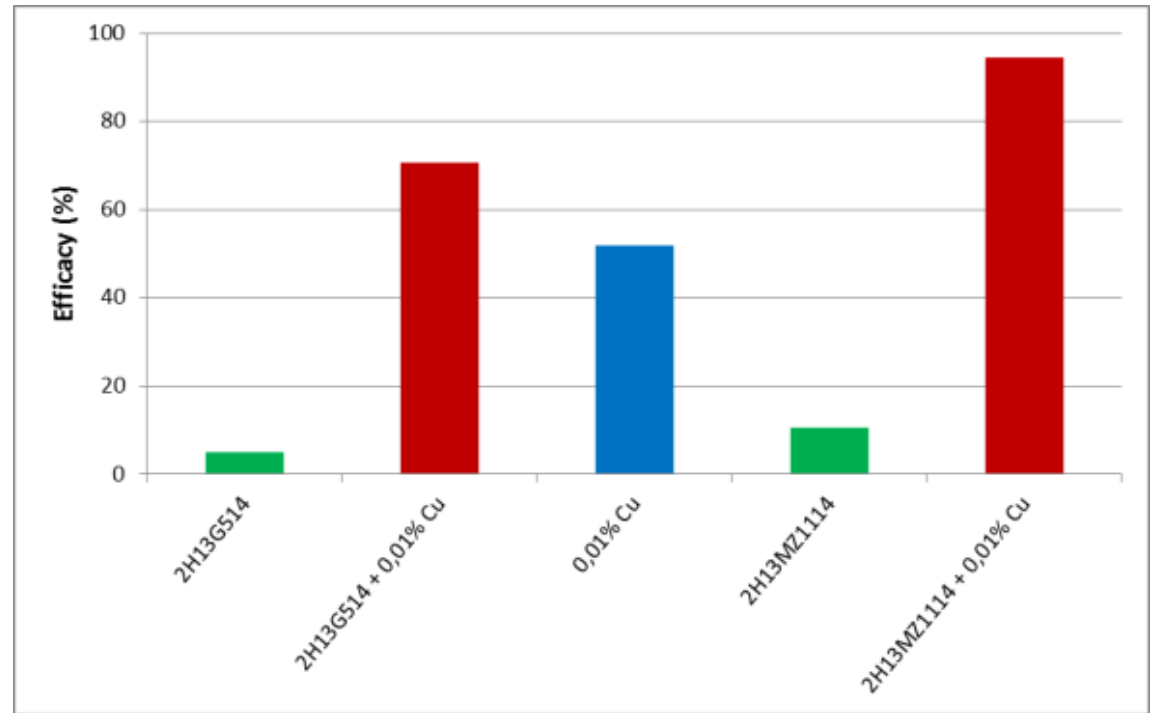
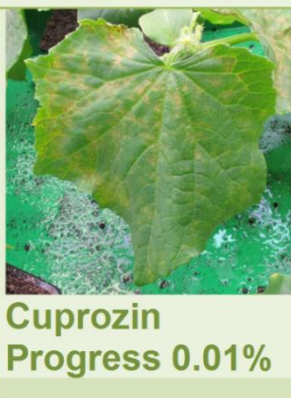
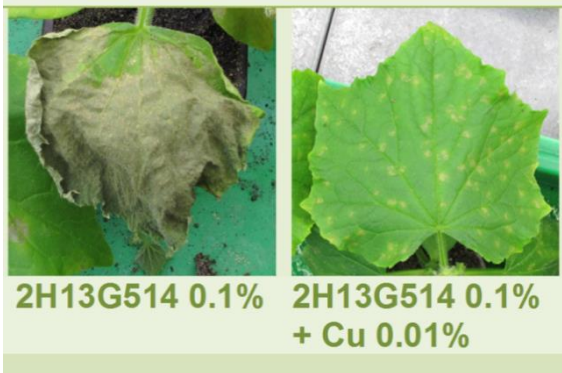
Lohnerhofstr. 7
D-78467 Konstanz



Growth chamber JKI Darmstadt

Pseudoperonospora cubensis / cucumber

8 d after inoculation



Kunz et. al, 2016. *Entwicklung eines biotechnologischen Pflanzenschutzmittels zur Bekämpfung von Oomyceten Abschlussbericht*. TIB-Hannover.

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Field trials 2017

➤ Potato

➤ Kleinmachnow

➤ Hohenheim

➤ Grapevine

➤ Freiburg

➤ Geisenheim



Field trials – grapevine 2017

On both locations aside of copper dosed at 3 kg/ha a reduced copper variant of 2 kg/ha according to the guidelines of the ECOVIN was carried out too.

Both trials were carried out with additional artificial inoculation

Treatments:

References: untreated

3 kg Cu

2 kg Cu

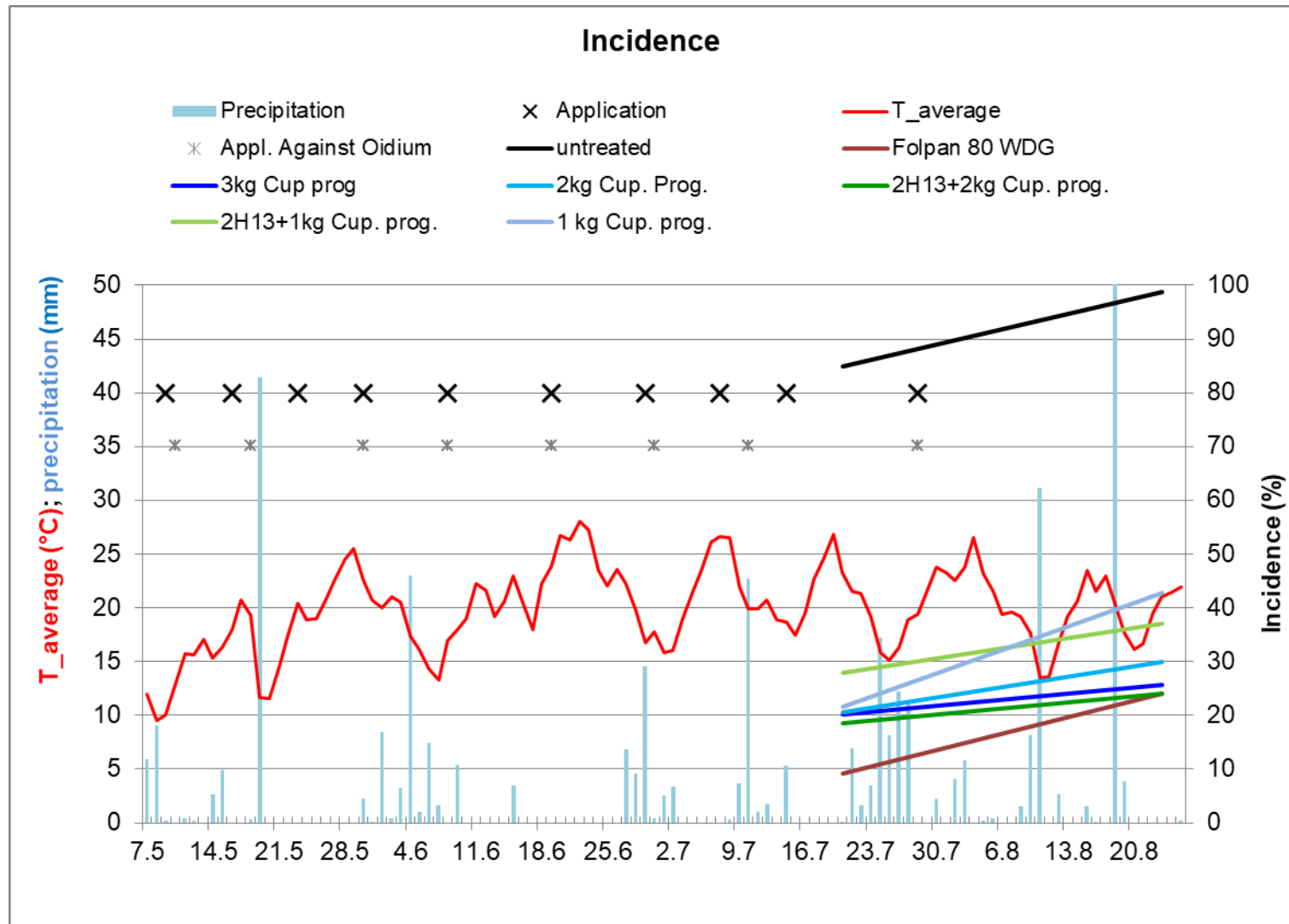
Test items: 1 kg Cu

1 kg Cu + 0,02% 2H13

2 kg Cu + 0,02% 2H13

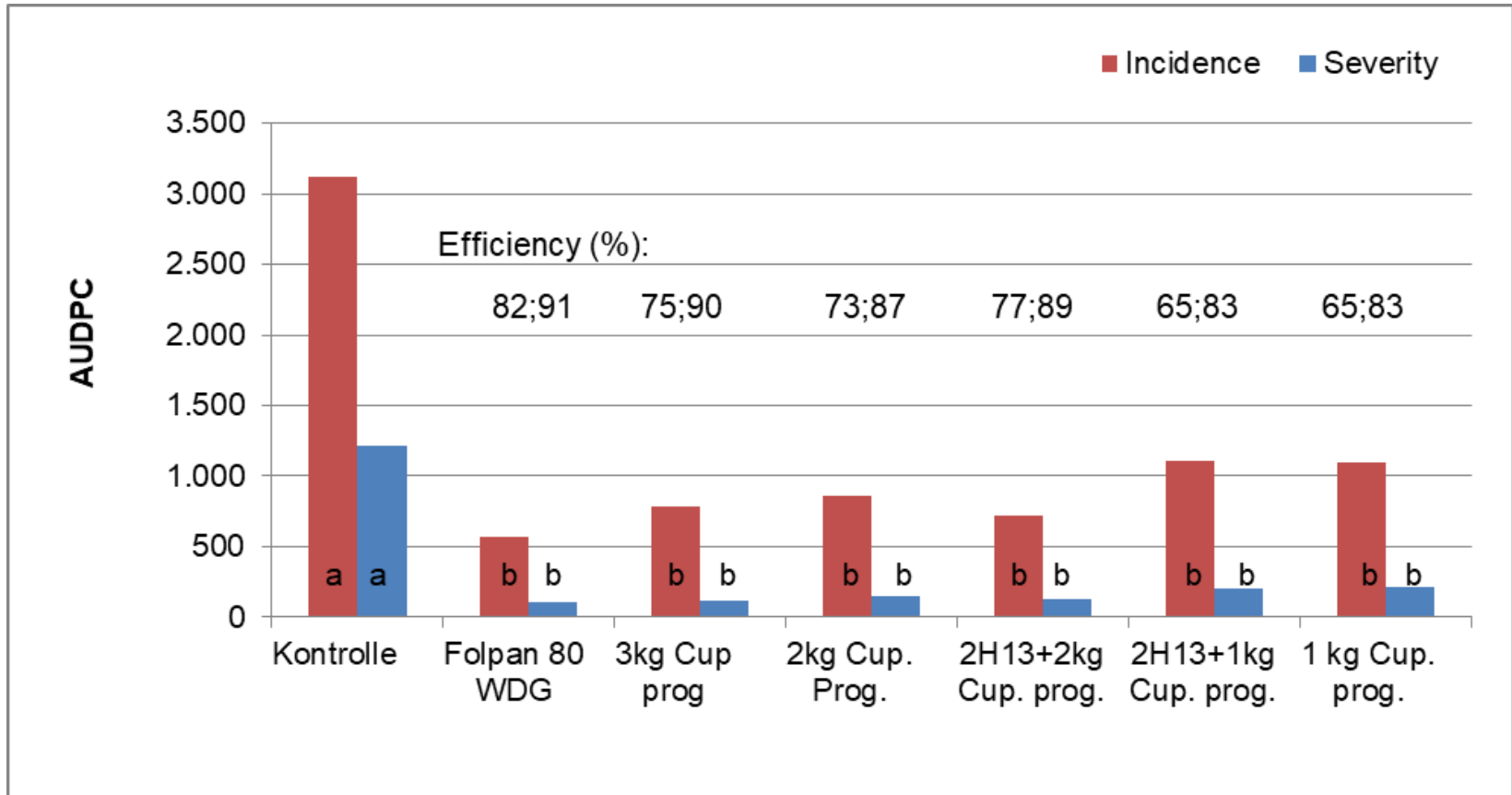
Freiburg, Weinbauinstitut

Leaf infection

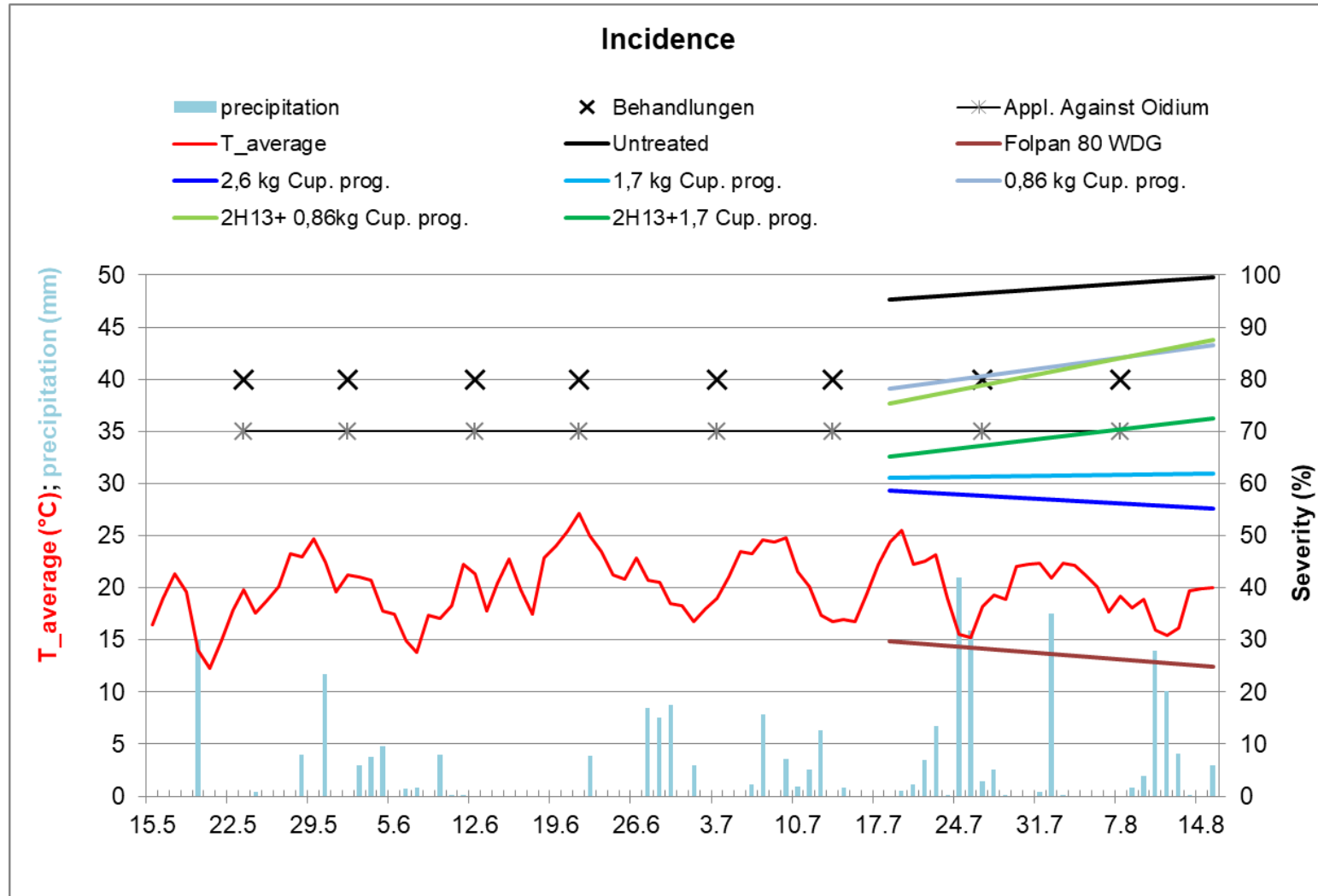


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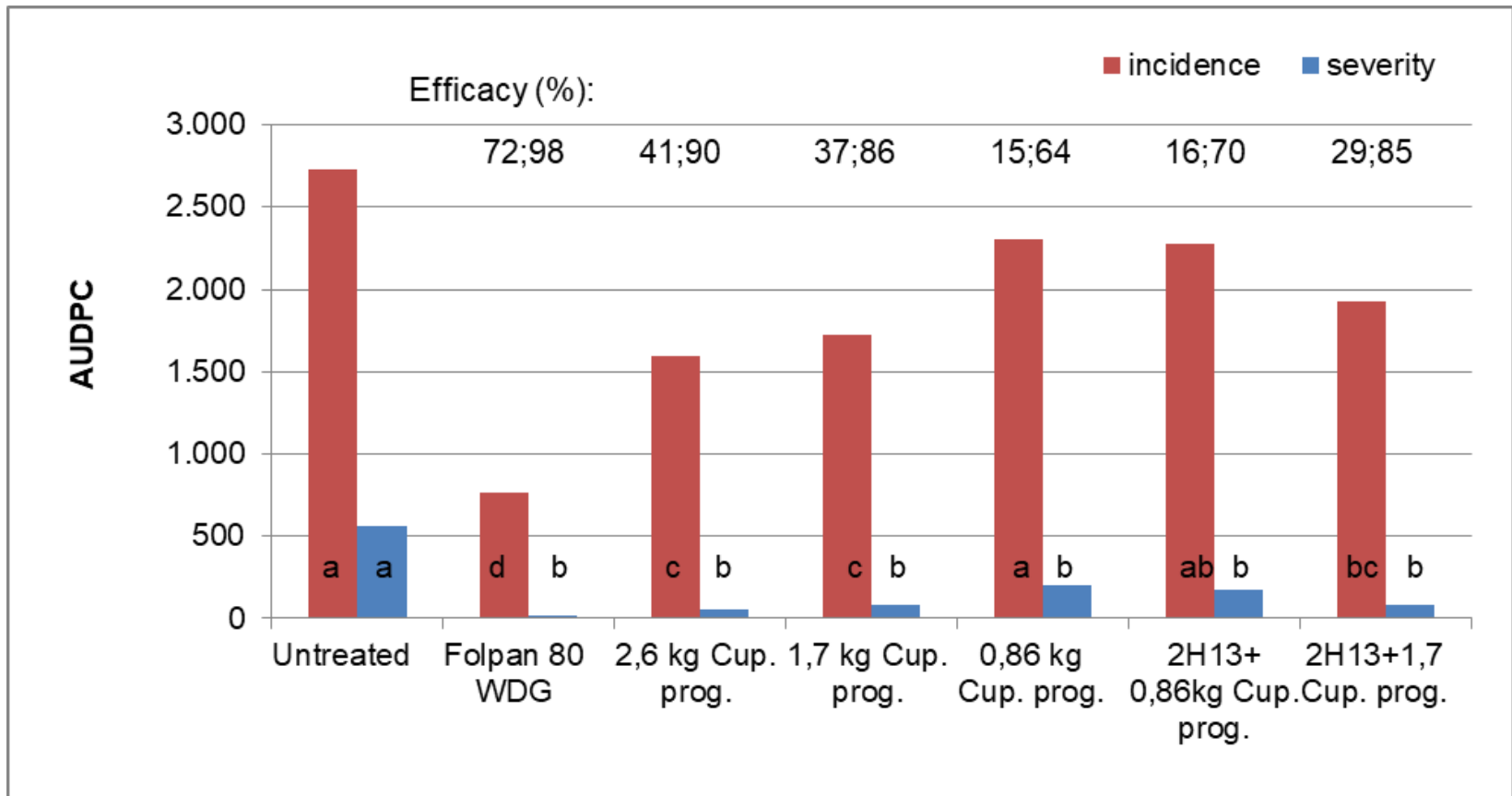
Leaf infection



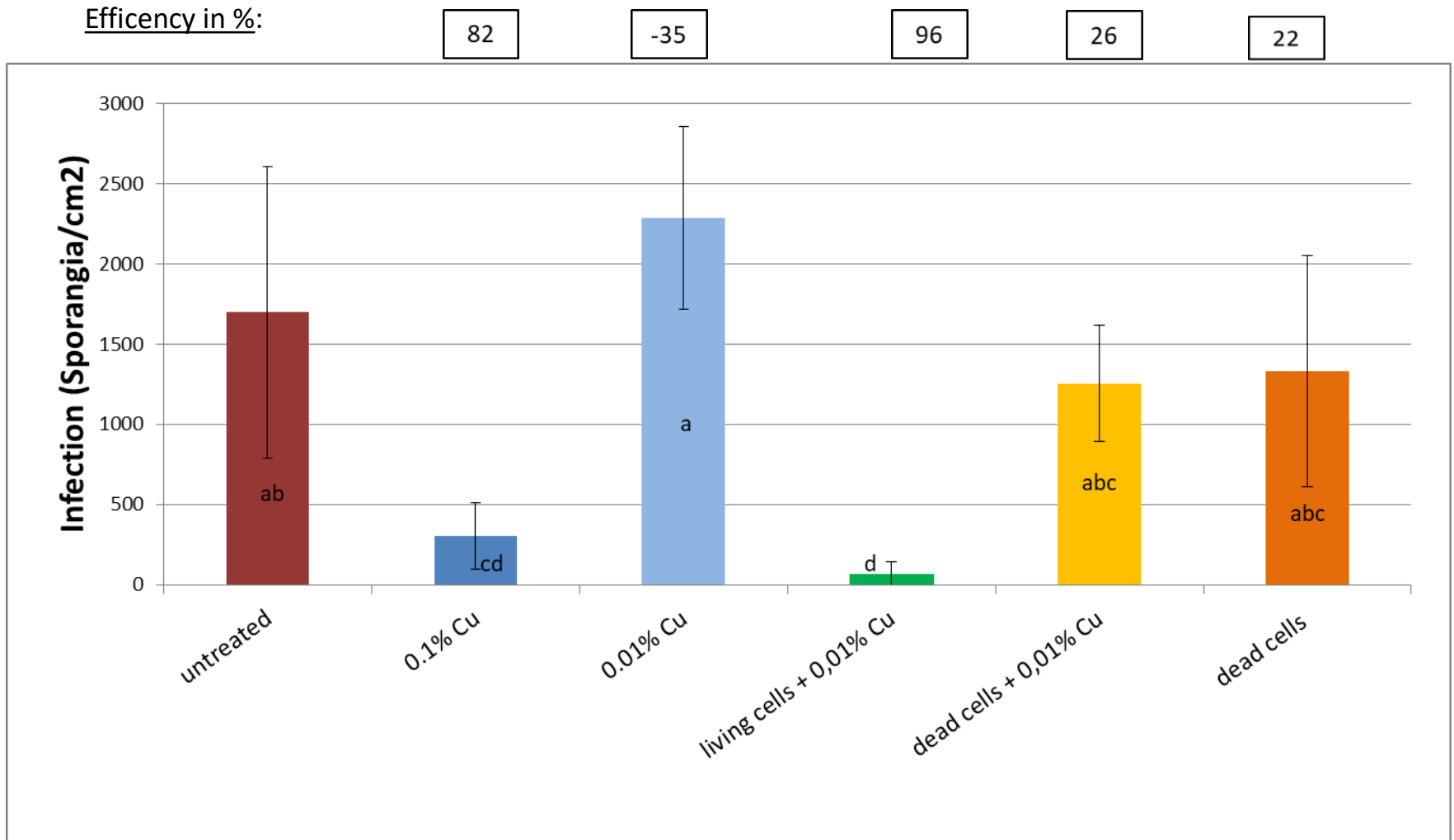
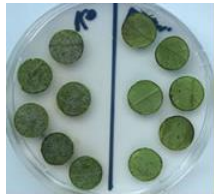
Leaf infection



Leaf infection



Wirksamkeit tote Hefe im Tomatenblattscheibentest



Upscaling



Product specification



Gesellschaft für Phytopathologie mbH

Certificate of Analysis

Product: 2H13

Batch No.: 170823

Production Date: August 2017

Physical/ Chemical Properties

Parameter	Result	Limits
Dry Matter	92.1 %	> 90 %
Pour Density	0.7 g/ml	0.5-1 g/ml
Appearance	brown granules	brown granules
Kind	wettable granules	wettable granules

Microbial Properties

Parameter	Cfu/g	Limits [cfu/g]	Method
.	8E+10	2E+10 – 2E+11	YM Agar, 25°C, 2d
Aerobic mesophilic plate count	< 1E+05	< 1E+05	PC-agar with Actidion, 30°C, 72 h
<i>Escherichia coli</i>	absent in 1 g	absent in 1 g	FDA BAM chapter 4
<i>Staphylococcus aureus</i>	absent in 1 g	absent in 1 g	MFHPB-21
<i>Salmonella</i>	absent in 25 g	absent in 25 g	FDA BAM chapter 5

Konstanz, 19.10.2017


Dr. Stefan Kunz

Greenhouse trials

Establishment of test systems using potted plants:

Tomato



Potato



Efficacy trials on potato plants

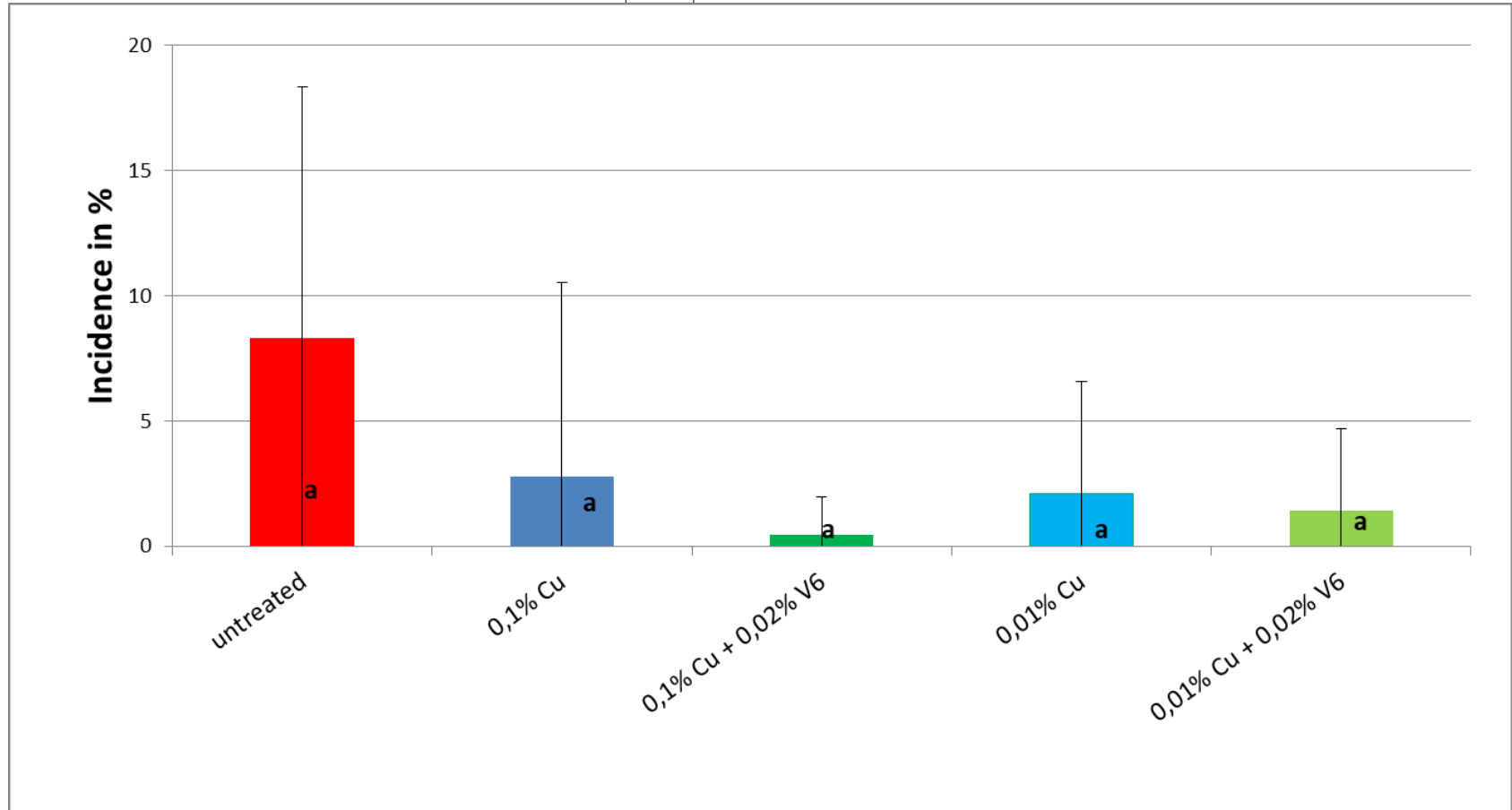
Efficiency in %:

67

95

75

83



Nicht parametrische Varianzanalyse nach Kruskal-Wallis ($p < 0,05$)

Efficacy trials on tomato plants

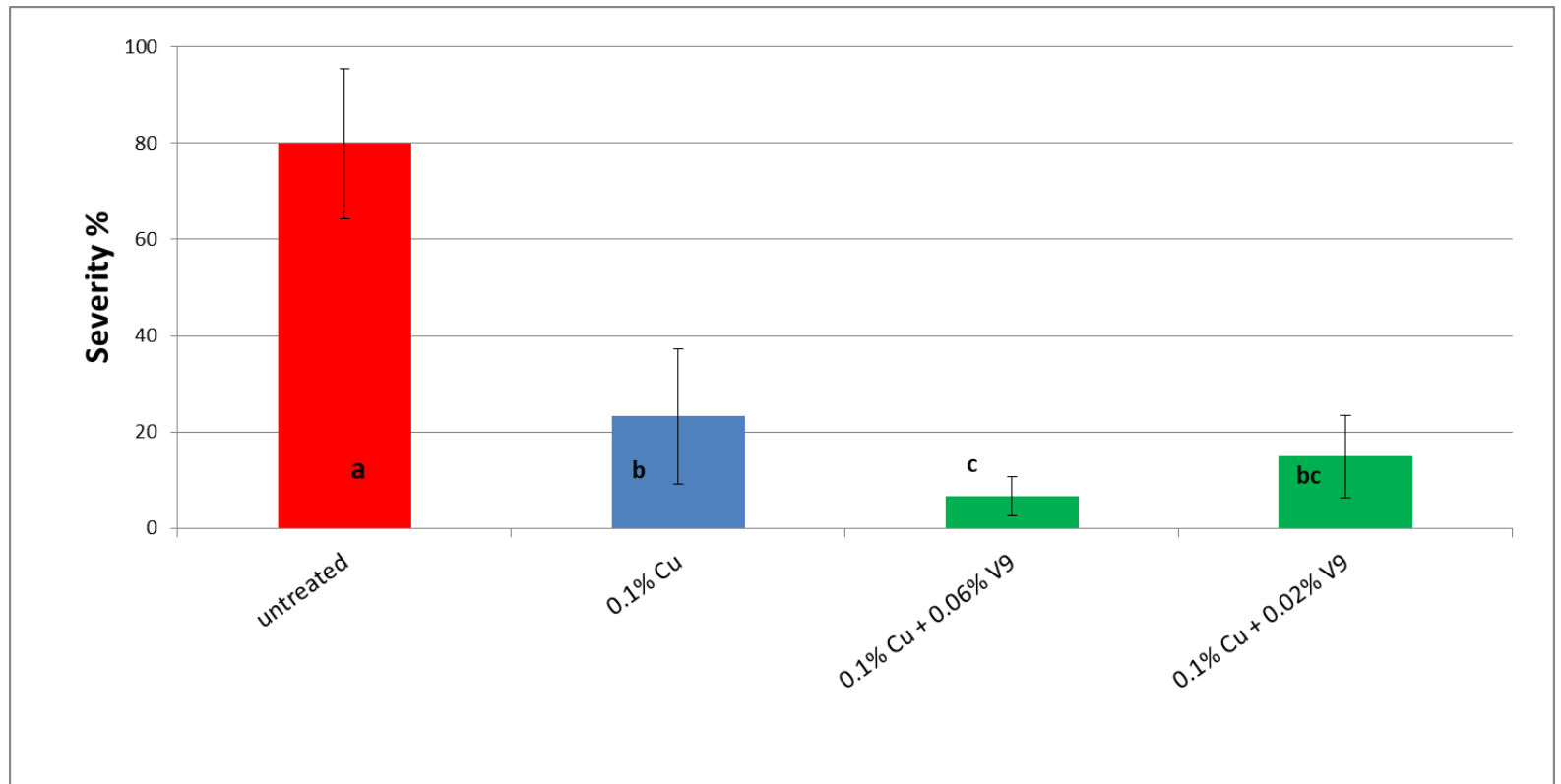


Efficacy in %:

71

92

80



One way analyses of variance after square root transformation; Tukey's Multiple Comparison Test ($p < 0,05$)

**Vielen Dank
für Ihre Aufmerksamkeit**

**Thank you
for your attention**

besonders Danken möchte ich dem Projektträger

der Deutschen Bundesstiftung Umwelt

Herrn Gottfried Bleyer vom Weinbauinstitut Freiburg

Herrn Ottmar Baus von der Hochschule Geisenheim

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