Control of common bunt in organic wheat cultivation

Presentation of a project in Sweden 2017-2020,
financed by Ekhaga Research Foundation*

* *Examples of research that can be supported are crops that today require pesticides can be grown organically in a quality and efficient way to provide better and healthier food*.

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Common bunt, a plant disease spread over large parts of the world

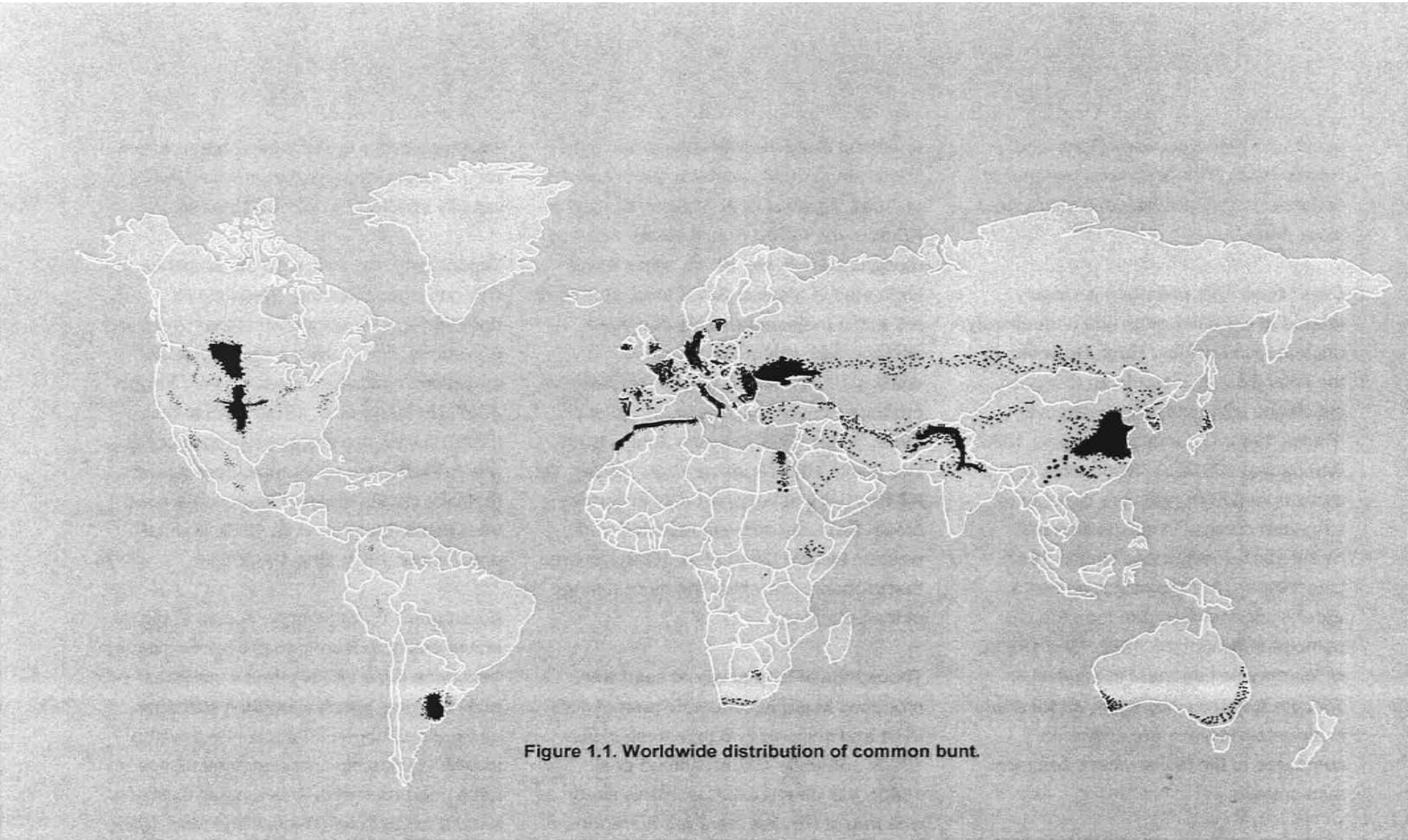
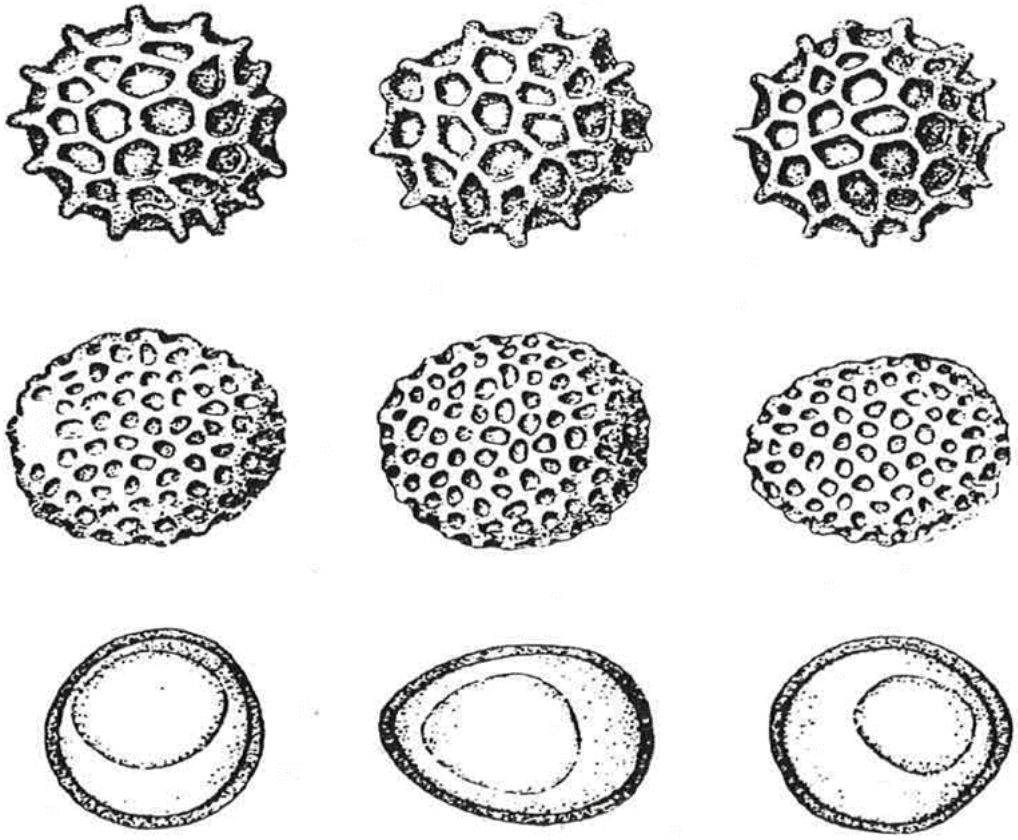


Figure 1.1. Worldwide distribution of common bunt.

Bunt in Sweden

Species	Common name
Tilletia tritici (syn. T. caries)	Common bunt; Stinking smut; Covered smut; Wheat bunt
Tilletia laevis (syn. T. foetida)	Common bunt; Stinking smut; Covered smut; Smooth-spored wheat bunt
Tilletia controversa	Dwarf bunt

Teliospores of *Tilletia tritici*, *T. intermedia* and *T. laevis*. After Savulescu 1944 according to Neergaard 1977.



Approved seed treatments in Sweden against common bunt

Product	a.i. (the numbers indicate g/l)
Bariton Super	Protiokonazo 50+Tebukonazol 10+Fludioxonil 37,5
Celest Formula M	Fludioxonil 25
Celest Extra Form M	Fludioxonil 25+Difenoconazole 25
Difend Extra	Fludioxonil 25+Difenoconazole 25
Dividend Formula M	Difenoconazole 30
Kinto Plus	Fluxapyroxad 33,3+Tritikonazol 33,3+Fludioxonil 33,3
Prepper	Fludioxonil 25
Seedron	Fludioxonil 50+Tebuconazole 10
Vibrance Duo	Fludioxonil 25+Sedaxane 25
Vibrance Gold	Sedaxan 50+Fludioxonil 25+Difenokonazol 25
Vibrance Star	Sedaxan 25+Fludioxonil 25+Tritikonazol 20
Cerall	*Pseudomonas chlororaphis*
ThermoSeed	Hot water vapor
Mustard seed powder	Powder 1.5 kg+4.5 L water for 100 kg of seed
Vinegar	

Field trials 2017/2018 – 2019/2020

Crop	Year	Series	Location/county	Treatments	Cultivars
Winterwheat	2017/2018	HS9–1111	Borgeby/M	14	2
Winterwheat	2017/2018	HS9–1111	Sandby/L	14	2
Winterwheat	2017/2018	HS9–1111	Roma/I	14	2
Winterwheat	2017/2018	HS9–1111	Jylland/Dk	14	2
Winterwheat	2018/2019	HS9–1112	Borgeby/M	12	2
Winterwheat	2018/2019	HS9–1112	Roma/I	12	2
Winterwheat	2019/2020	HS9–1113	Brunnby/U	22	6
Winterwheat	2019/2020	HS9–1113	Roma/I	22	6
Winterwheat	2019/2020	HS9–1113	Jylland/Dk	22	6
Springwheat	2018	HS9–3001	Borgeby/M	7	1
Springwheat	2018	HS9–3001	Roma/I	7	1
Springwheat	2018	HS9–3001	Brunnby/U	7	1
Springwheat	2018	HS9–3001	Jylland/Dk	7	1
Springwheat	2019	HS9–3002	Borgeby/M	28	1
Springwheat	2019	HS9–3002	Roma/I	28	1
Springwheat	2019	HS9–3002	Brunna/U	28	1
Springwheat	2019	HS9–3002	Jylland/Dk	28	1

High infestation levels in many of the seed lots used!

Tc Tilletia caries, Tl T. laevis

Crop	Series	Cultivars	Spores, thousands / gram seed
Winterwheat	HS9–1111	2	127-163 Tc, 784 Tl
Winterwheat	HS9–1112	2	127-163 Tc, 784 Tl
Winterwheat	HS9–1113	6	0.37, 0.77, 1,4, 38, 500, 660 Tc
Springwheat	HS9–3001	1	330 Tl
Springwheat	HS9–3002	1	500 Tl

The LA-OH small scale organic brushing machine from Westrup in Dk

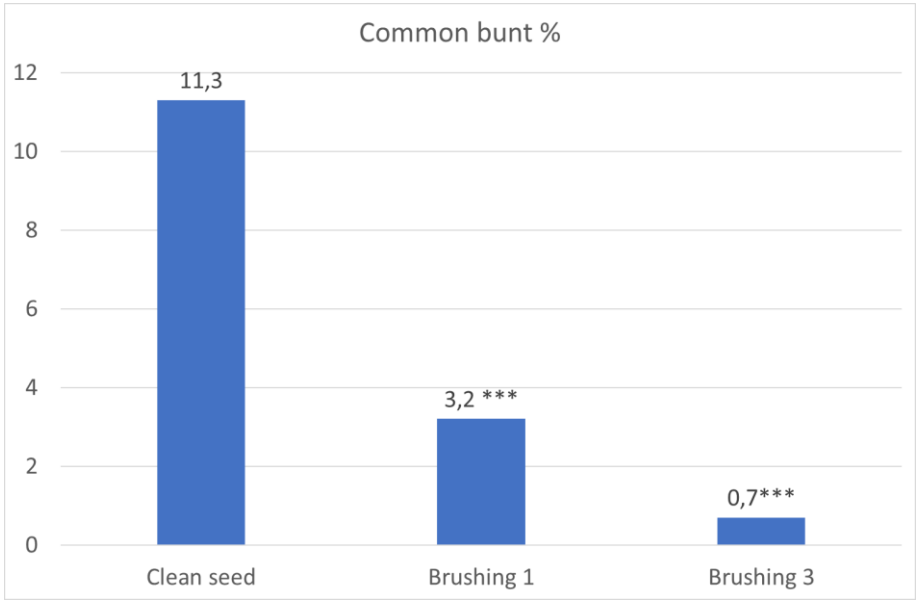

SATEC
EQUIPMENT

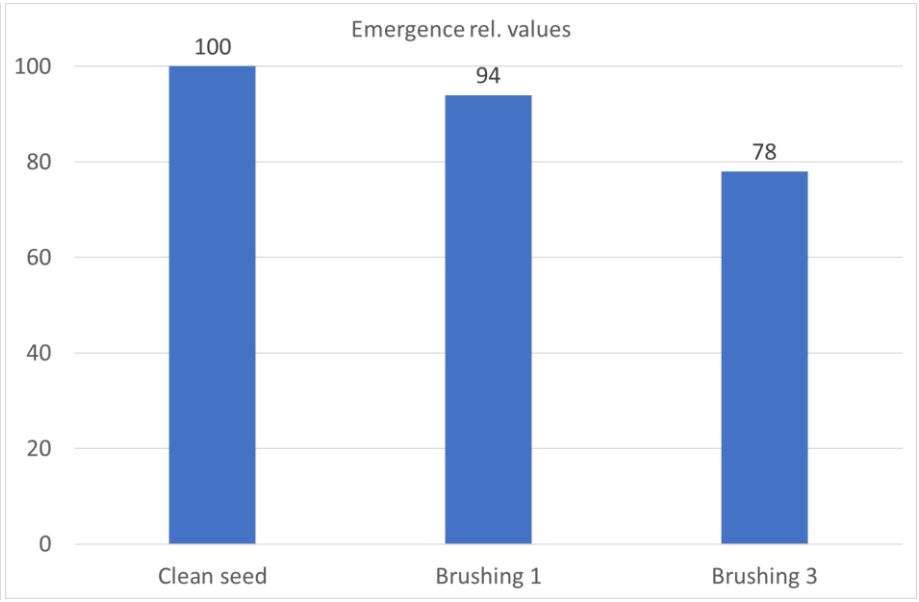

6. Tillerar Havre
7. Sorterar Havre
5. Cerall Havre

Common bunt attack in the field

Coomon bunt, attacked ears and seeds

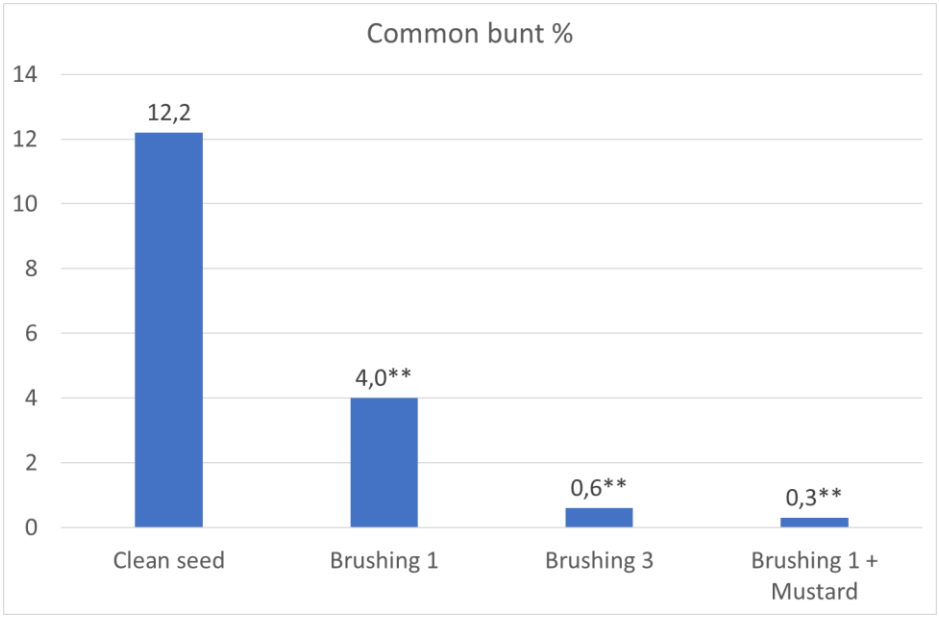
Comparison brushing once or three times,
field trials common bunt 15, emergence 11

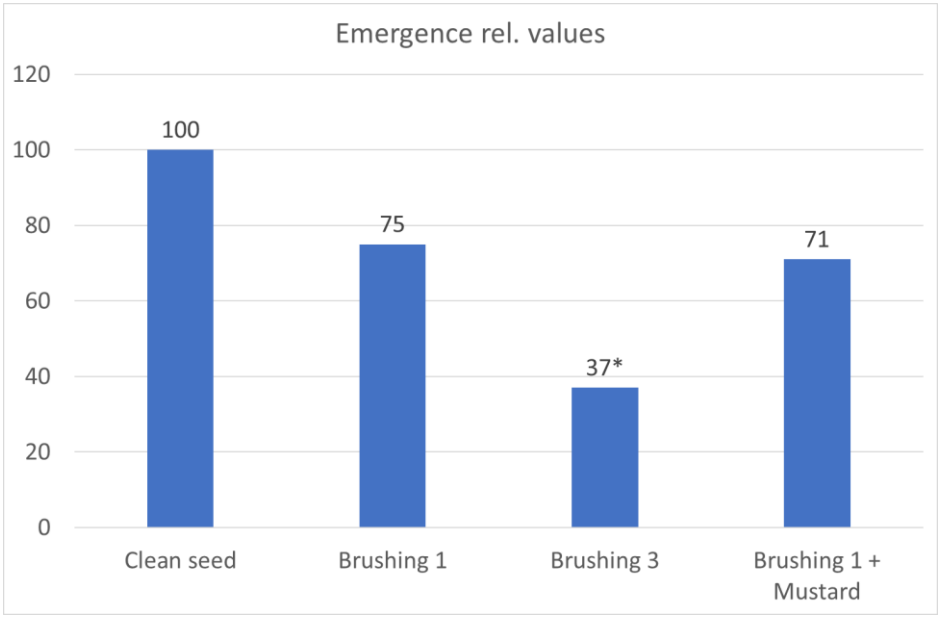




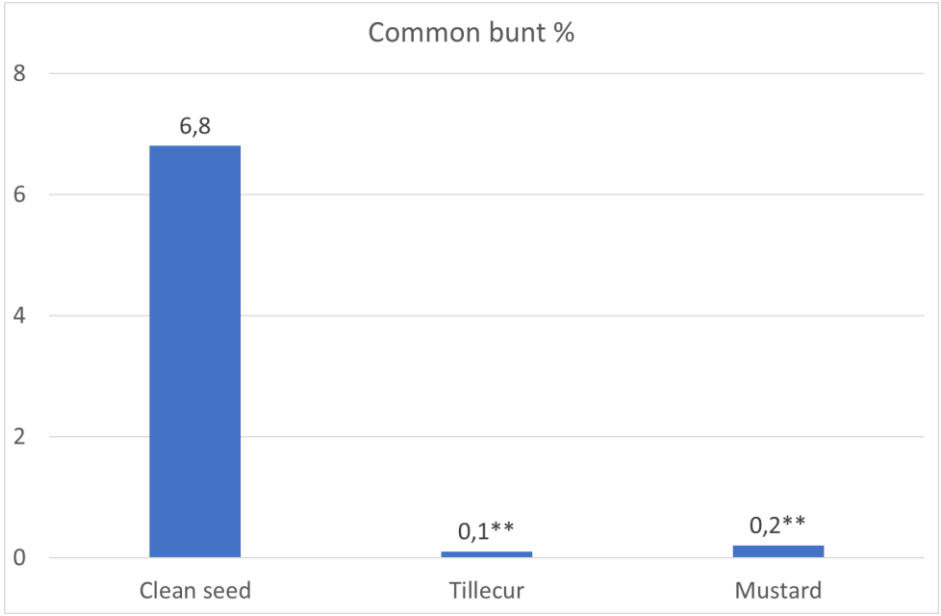
Comparison brushing once, brushing three times and brushing once + mustard seed powder,

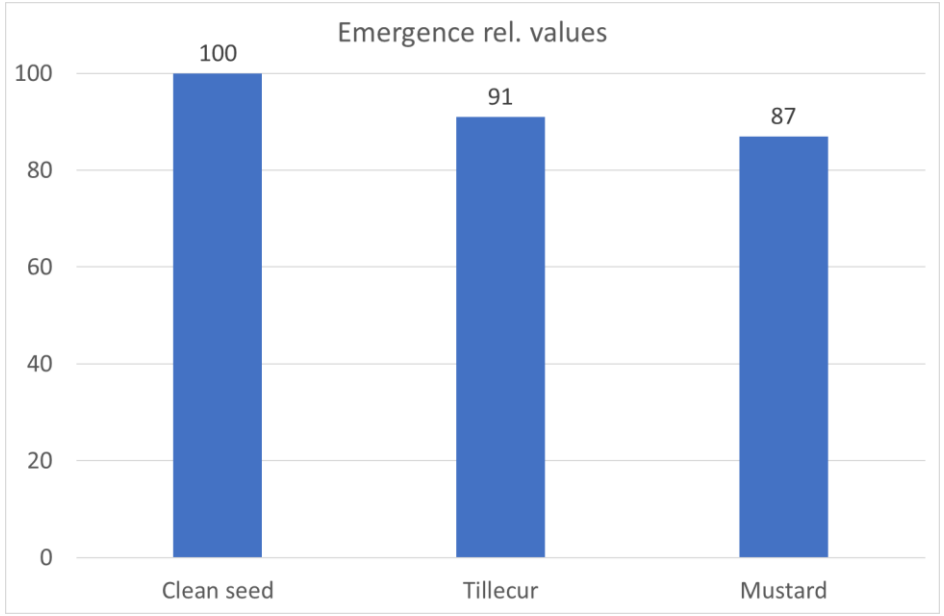
field trials common bunt 8, emergence 5



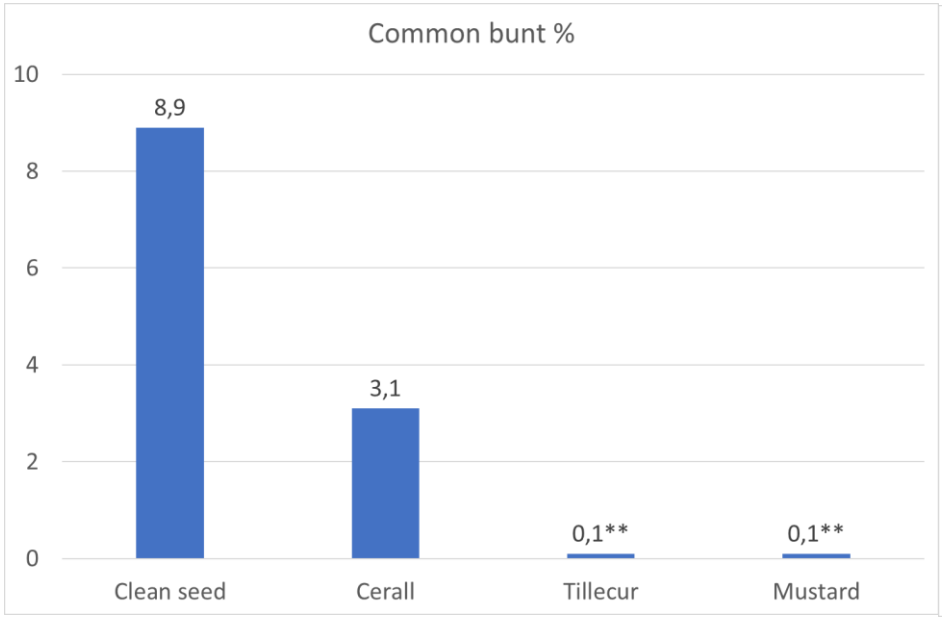


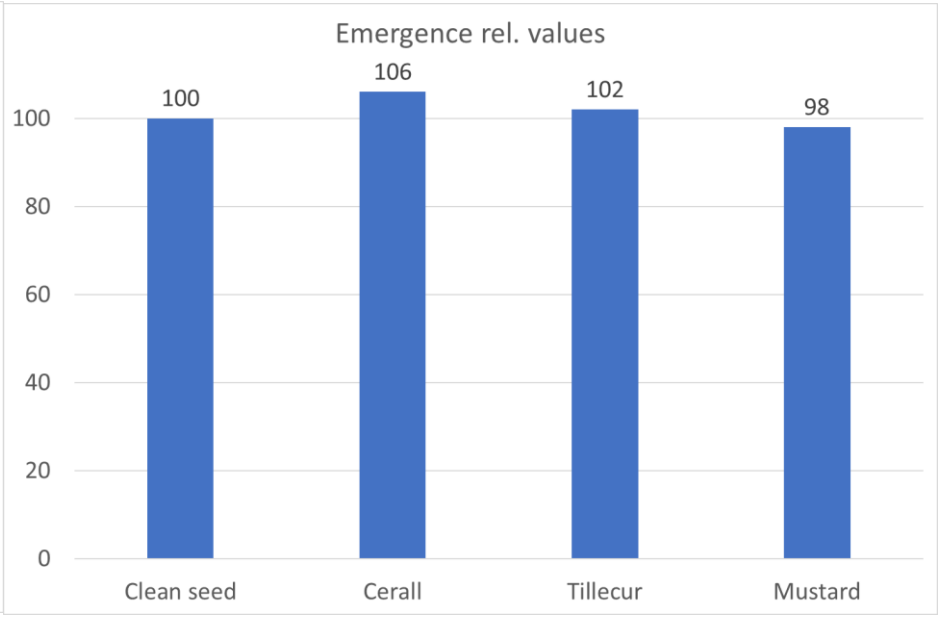
Comparison Tillecur and Mustard seed powder,
field trials common bunt 14, emergence 12



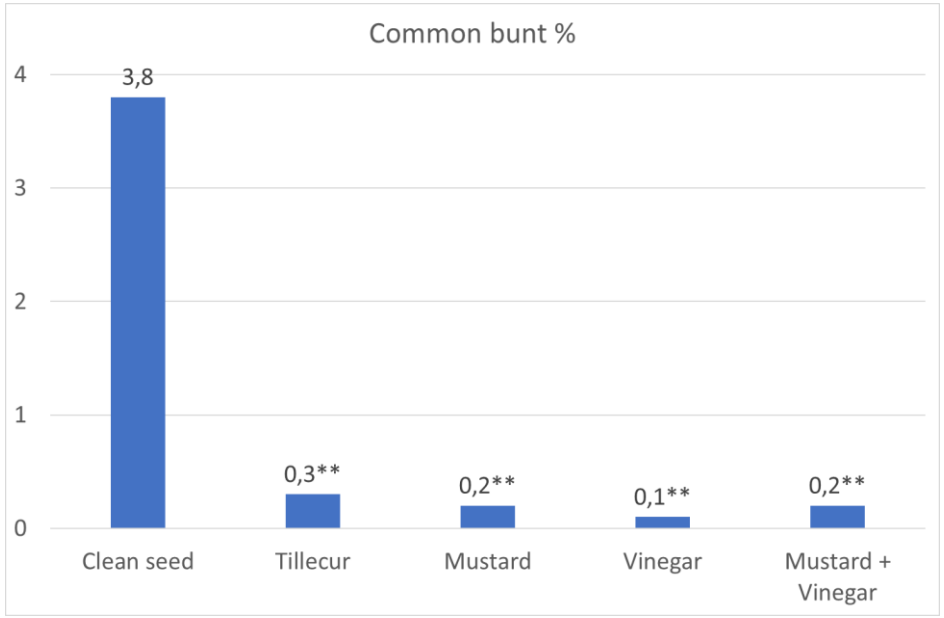


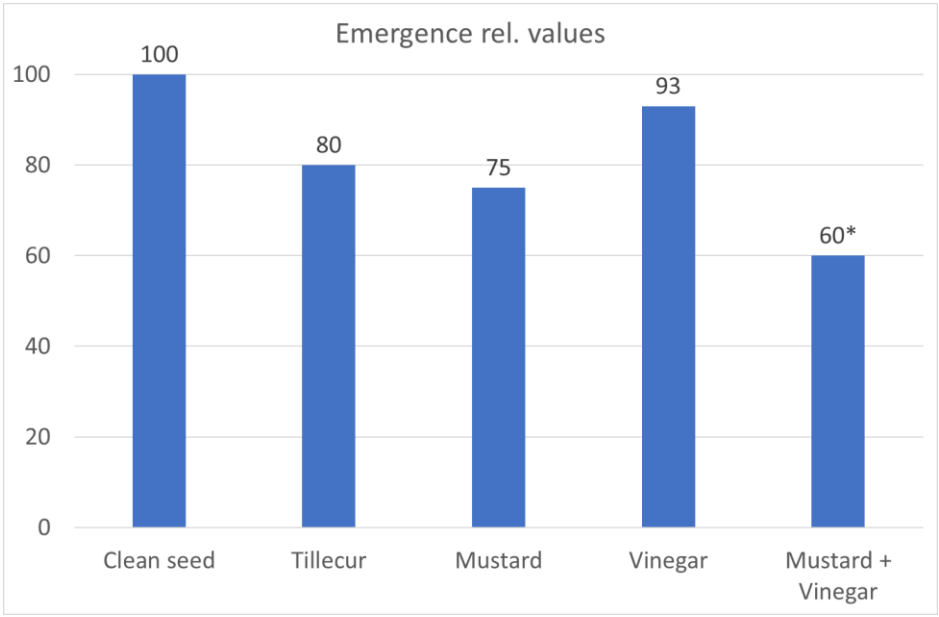
Comparisons Cerall, Tillecur and Mustard seed powder,
field trials common bunt 10, emergence 8





Comparisons Tillecur, mustard seed powder, vinegar and mustard seed powder+vinegar, field trials common bunt 6, emergence 6





Summary and conclusions

- Decontamination by brushing the seeds, seed treatment with mustard seed powder, herbal extracts and other substances as well as various combinations of these proved to have a good effect and some very good effect against common bunt.
- Unfortunately, some of the treatments significantly reduced the number of plants at emergence.
- If there is the slightest suspicion that a seed lot is infected with common bunt, it should be analyzed. In a pre-test, which takes two to three weeks, the effect of brushing, seed treatment agents and combinations of them on germination must be examined.
- Infected seed lots can be seed treated and possibly brushed once even if no pre-test has been done, and then with only mustard seed powder (15 g / kg seed) + water (20 ml), or 20 ml vinegar.
- The effects of brushing and seed treatments on germination should be further investigated.

Thanks!