

Science For A Better Life

Diseases affecting cereal seed and implication for a successful fungicide control

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Research Disease control

Forward-Looking Statements

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Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at www.bayer.com.

The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.

History of seed treatment

Bayer Beiztradition
und Erfahrung
seit 1914

U s p u l u n

Wirksamste Saatbeize

zur Vernichtung aller am Saatgut äußerlich anhaftender schädlicher Pilzkeime

Erprobt gegen: Stein- (Stink-) brand d. Weizens, Fusarium (Schneeschimmel) d. Roggens u. Weizens, Roggenstengelbrand, Streifenkrankheit d. Gerste, beide Arten von Haferflugbrand, Wurzelbrand d. Rüben, Brennfleckenkrankheit d. Bohnen u. Erbsen usw.

Erhältlich in allen üblichen Verkaufsstellen

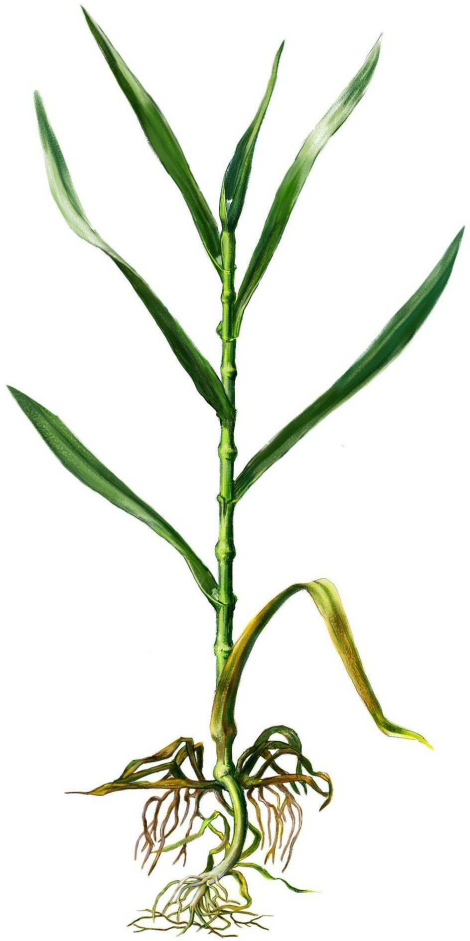
Farbenfabriken vorm. Friedr. Bayer & Co, Leverkusen b. Cöln

Pests and diseases in cereals

Pests

Leaf pests
e.g. Aphids, Thrips, cicadas

Soil pests
z.B. wireworms



Diseases

air-borne
e.g. powdery mildew rust

Seed-borne (surface)
e.g. common bunt

Seed-borne (embryo)
e.g. loose smut, snow mold

Soil-borne
e.g: snow mold

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Diseases

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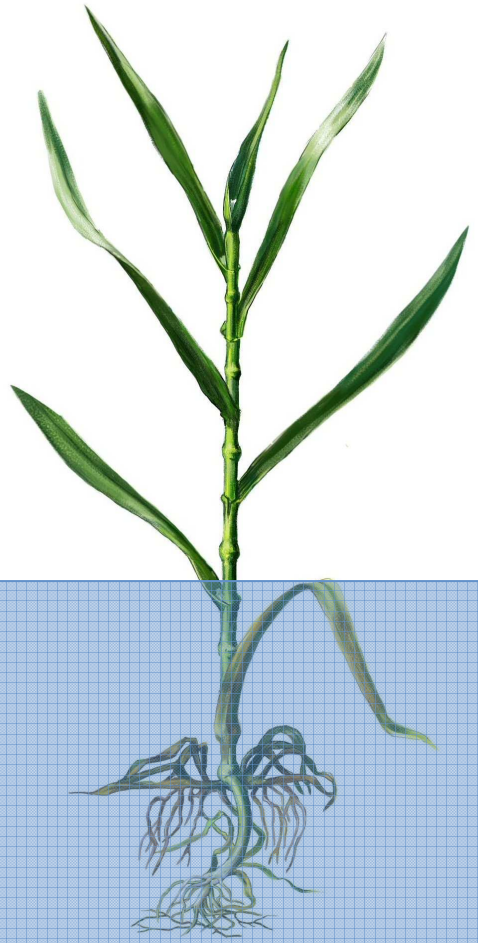


Soil pests
z.B. wireworms

Seed-borne (surface)
e.g. common bunt

Seed-borne (embryo)
e.g. loose smut, snow mold

Soil-borne
e.g: snow mold

Conventional seed treatment

Pests and diseases in cereals

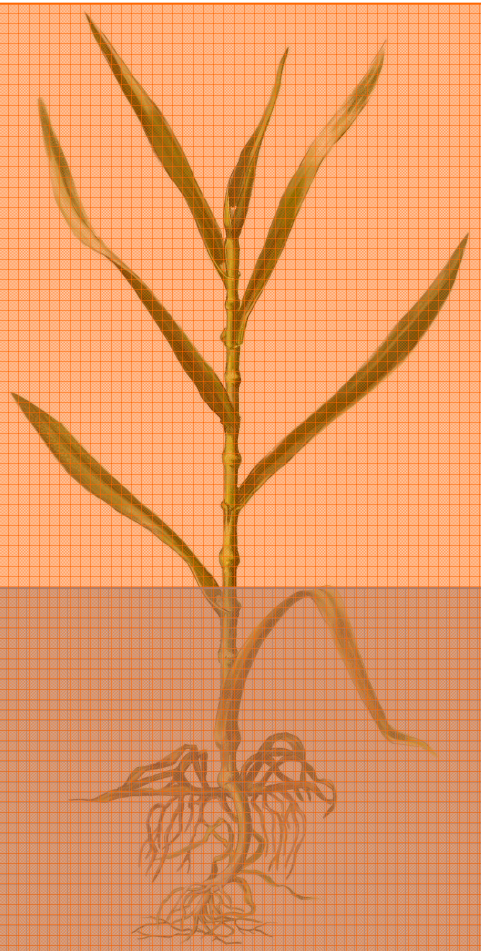
Schädlinge

Blattschädlinge
z.B. Läuse, Thrips, Zikaden

modern seed treatment

Bodenschädlinge
z.B. Drahtwürmer

konventionelle Saatgutbehandlung



Krankheiten

windbürtig
e.g. Mehltau, Rost

samenbürtig (Oberfläche)
z.B. Steinbrand

samenbürtig (Embryo)
z.B. Flugbrand, Schneeschimmel

bodenbürtig
z.B. Schneeschimmel

Conventional seed treatment

Control of seed and soil-borne pathogens

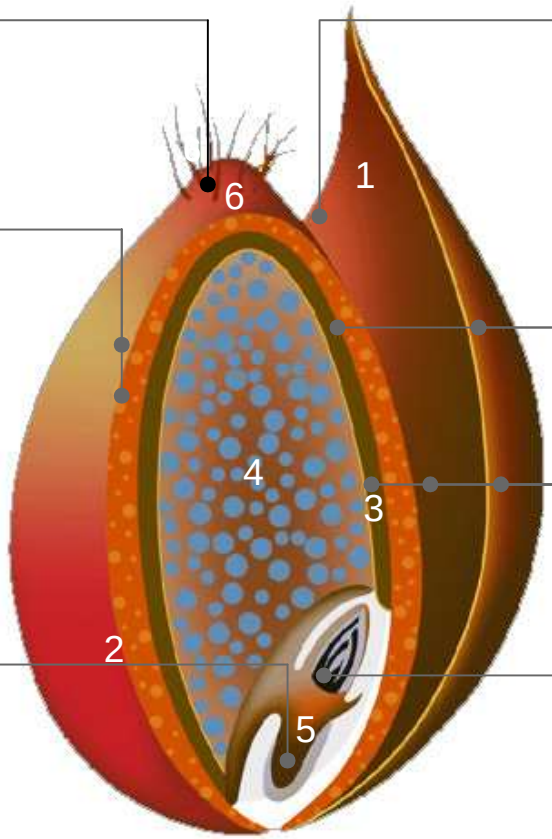
Common bunt/Wheat

Tilletia caries
Tilletia foetida

Septoria glume blotch / wheat
Leptosphaeria nodorum

Loose smut /wheat-barley

Ustilago nuda



Braunflecken / wheat, barley
Cochiobolus sativus

Leaf stripe / Gerste
Pyrenophora graminea

Fusarium / wheat-barley

Snow mold/wheat
Microdochium nivale

Cereal grain with glume

1 Palea inferior (glume)
2 Pericarp and Test a (seed coat)
3 Aleuron layer
4 Endosperm
5 Embryo
6 Beard

Seed treatment activity

Requirements from officials (example of Germany)

Diseases

Leaf stripe

Flag smut

Loose smut

common bunt | Dwarf bunt

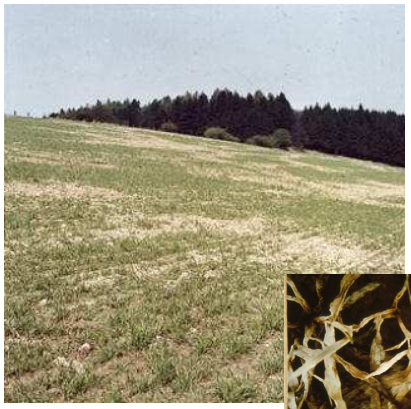
Snow mold

Fusarium spp.

Registration requirements of the BBA (German officials)

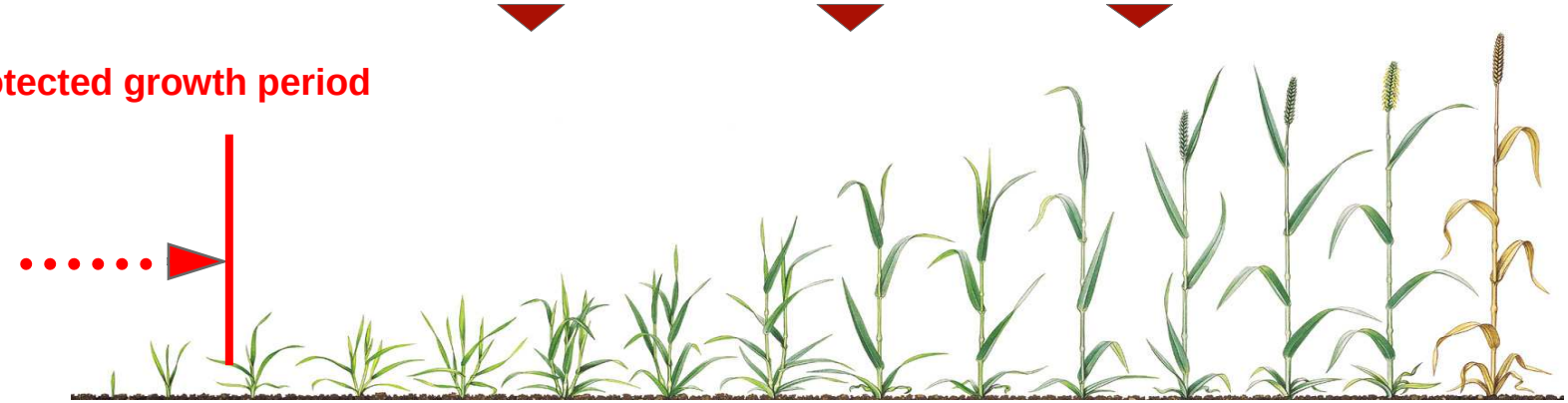
Barley	Rye	Wheat Barley Oat	Wheat	Wheat	Wheat Rye Ttriticale	Wheat Rye Triticale
95%	95%	95%	**99,5%**	85%	95%	95%

Microdochium nivale
Disease cycle



Conventional seed treatment

Conventional seed treatment:



LAMARDOR

Raxil

bariton

Pests and diseases in cereals

Schädlinge

Blattschädlinge
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modern Seed treatment

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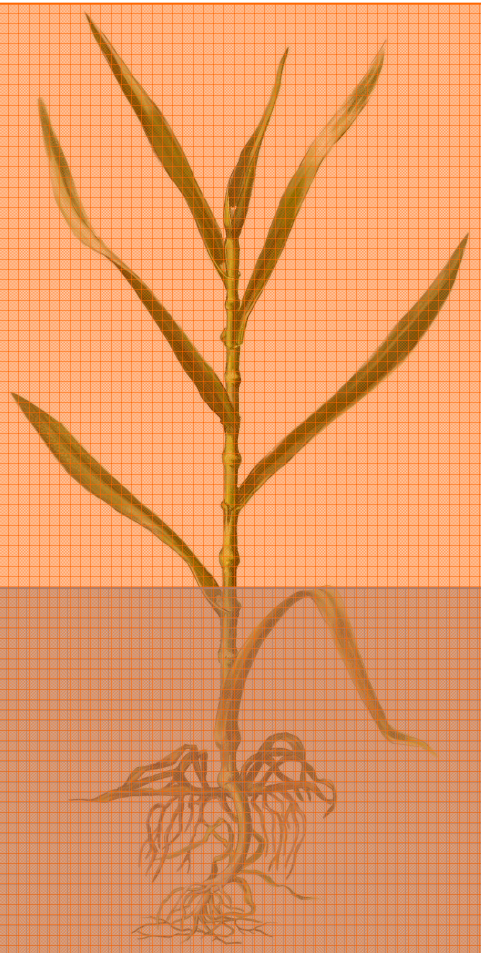

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bodenbürtig
z.B. Schneeschimmel

Puccinia recondita & P. dispersa
Disease cycle

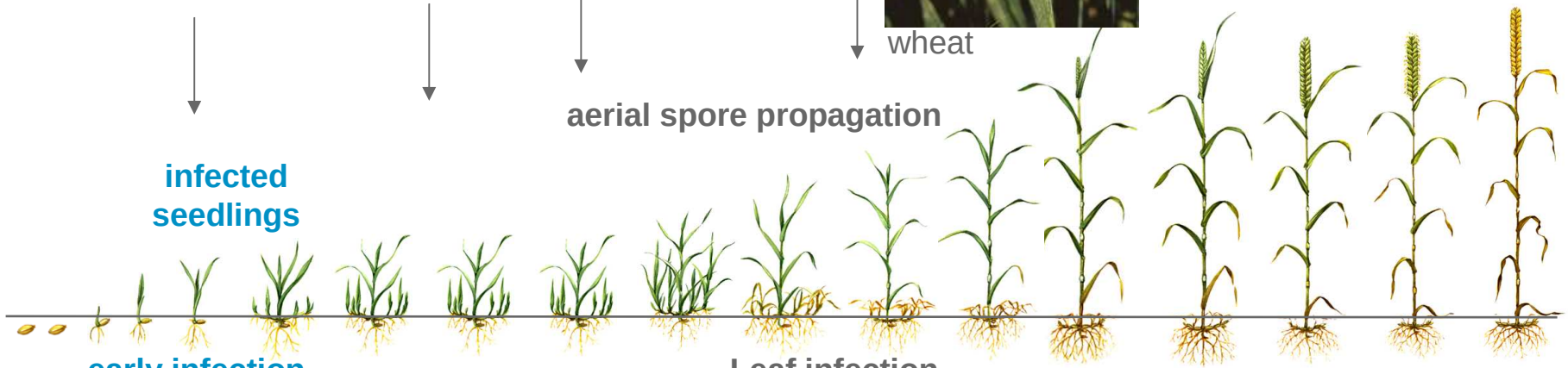
wheat

wheat

No infection of the ear

aerial spore propagation

infected seedlings



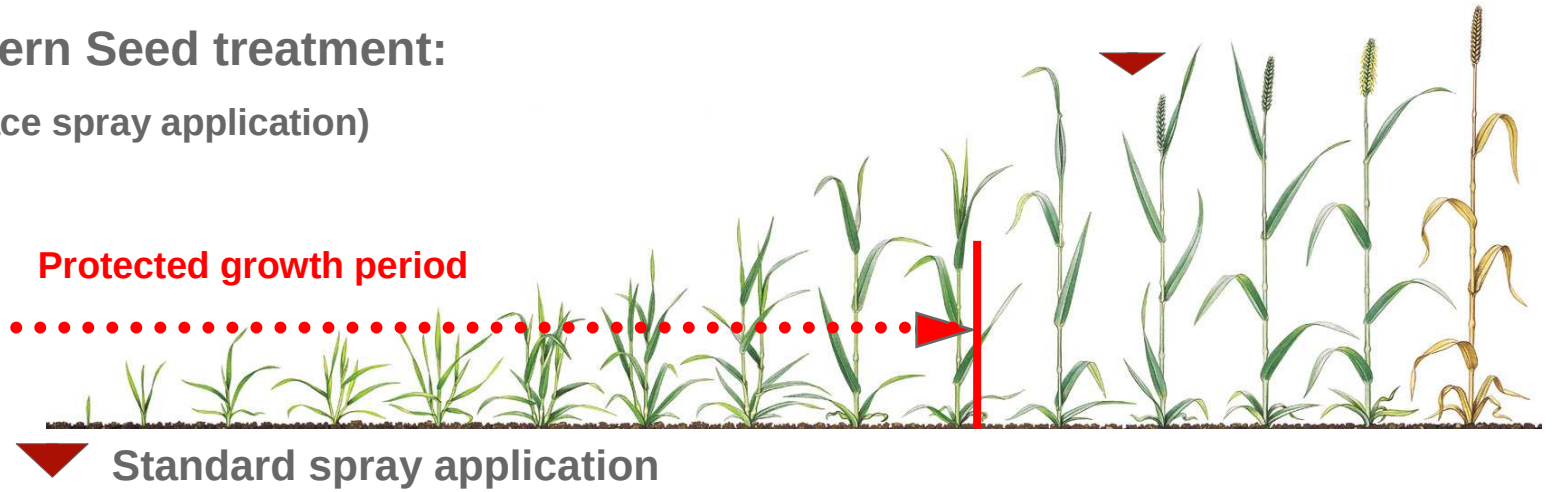
early infection

Leaf infection

Seed treatment

Modern Seed treatment:

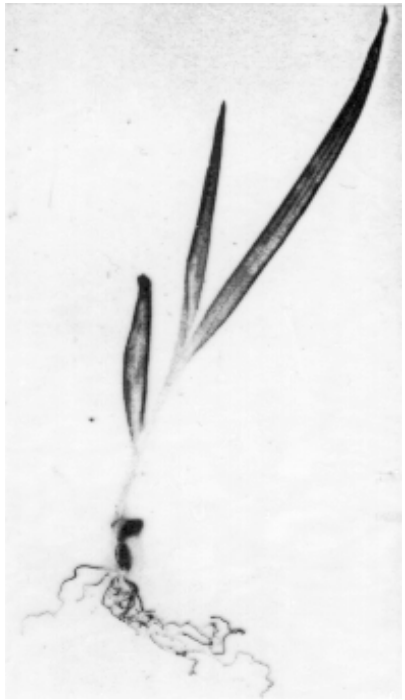
(replace spray application)



BAYTAN UNIVERSAL

Modern seed treatment

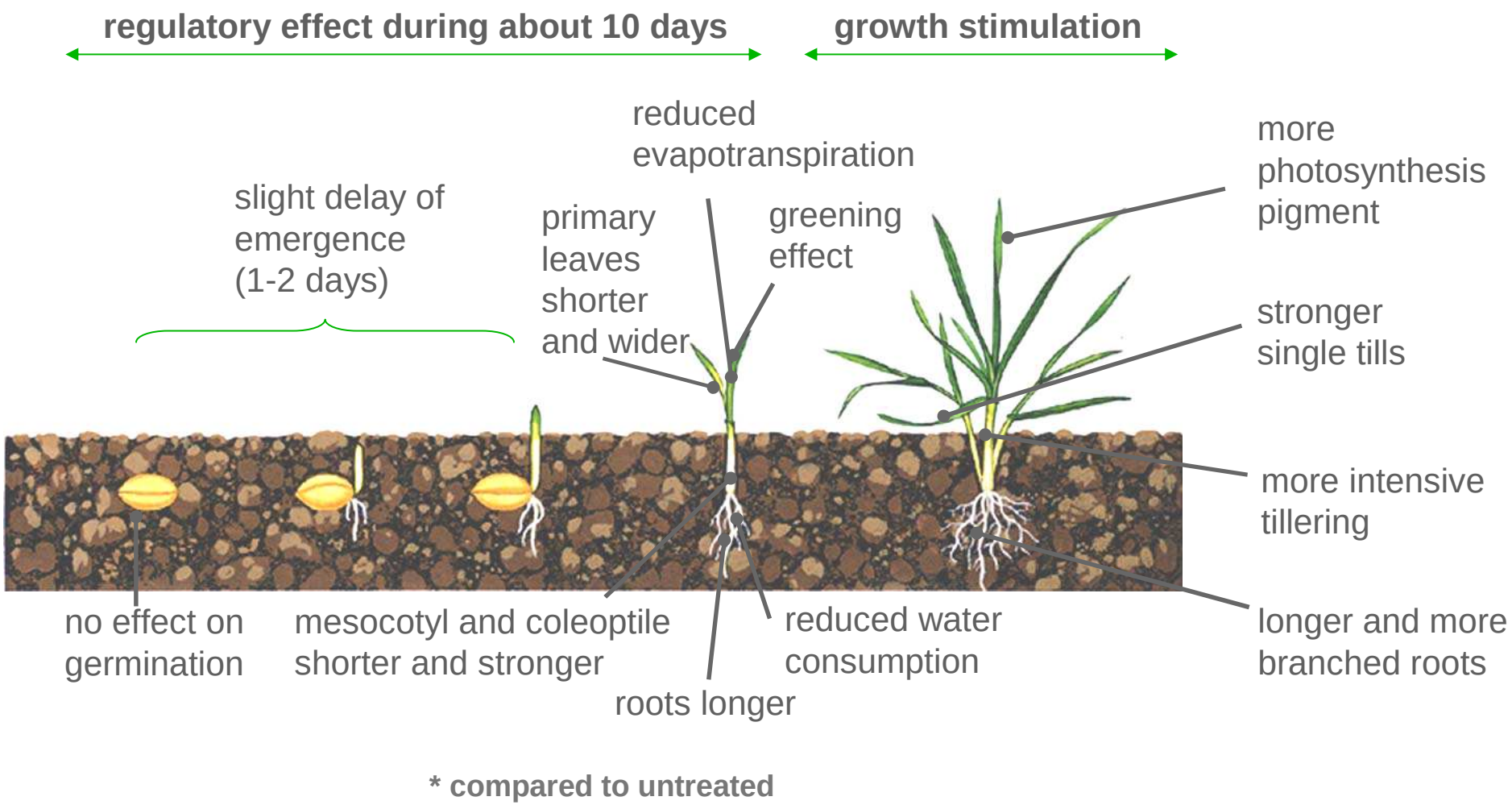
Optimal systemic properites for a long lasting activity



^{14}C triadimenol

Optimal penetration of the active substance allows a distribution In the whole plant

Baytan® - Growth regulatory effects

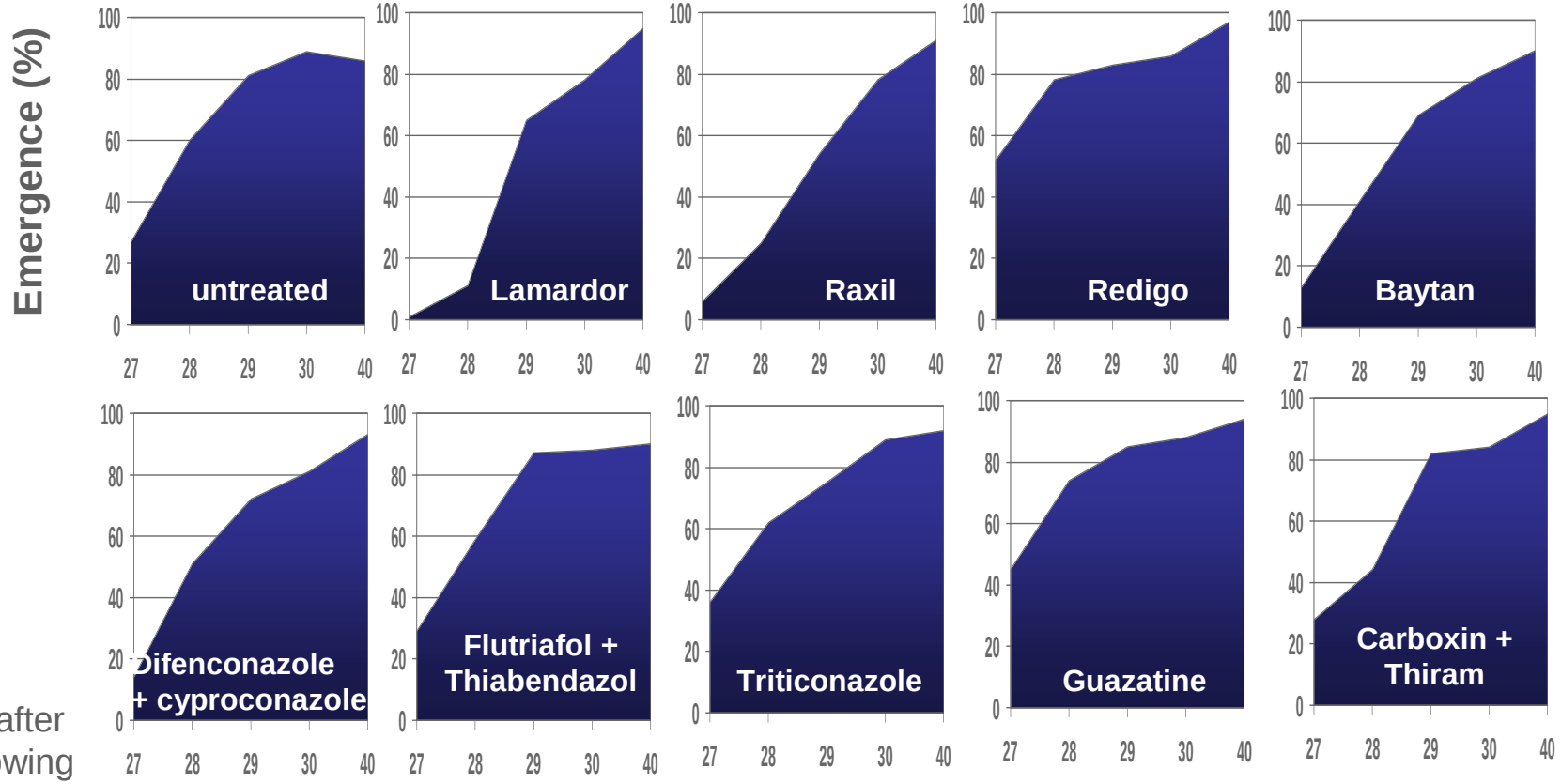


*** compared to untreated**

Crop safety under adverse conditions

Cold test: 28 days at 5℃, that followed 10℃ – Vari ety **„Zentos“**

Emergence: mean of app. 100 plants



Growth regulatory effects

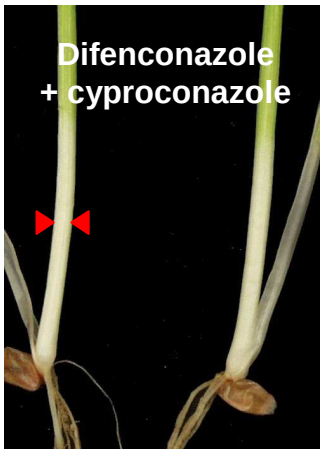
Width of shoots (mean of 25 shoots)

1.0 mm

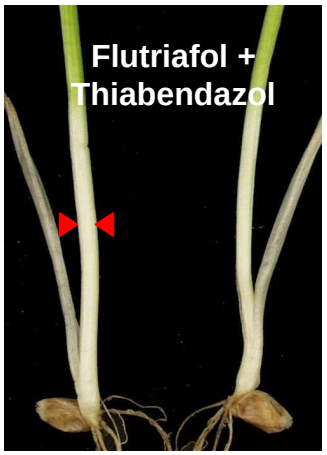
1.9 mm

1.7 mm

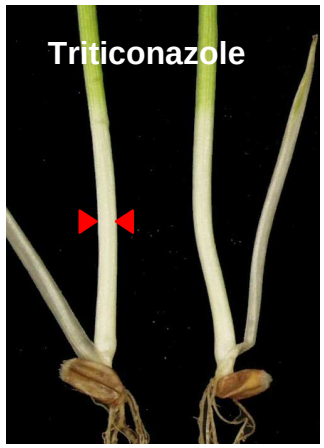
Raxil and Baytan treated seeds produce stronger shoots with clearly better seedling vigour



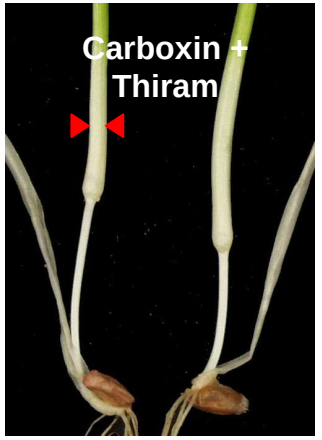
1.5 mm



1.4 mm



1.4 mm



1.0 mm

Impact of growth regulatory effects under special conditions

Sowing depth

Emergence & sowing depth - healthy seeds

Initial evaluation

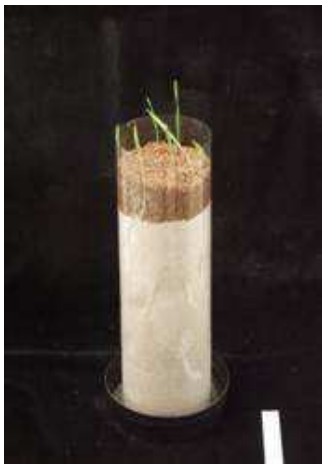
untreated

3 cm

6 cm

9 cm

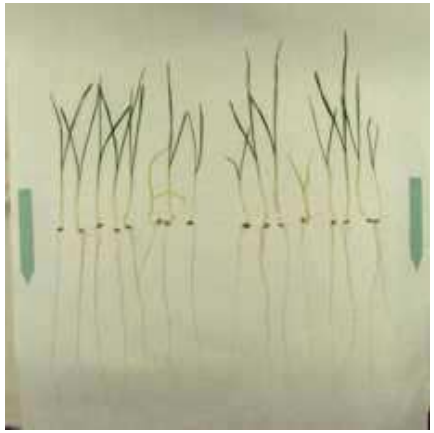
Raxil®

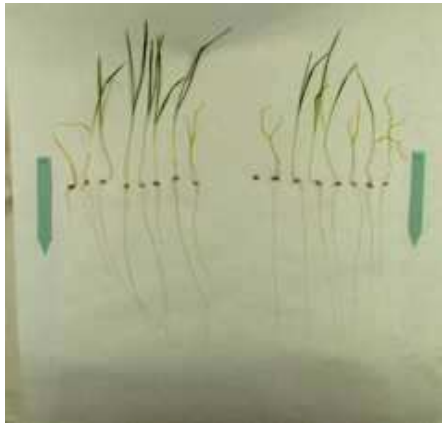


Emergence & sowing depth - healthy seeds

Final stand

untreated



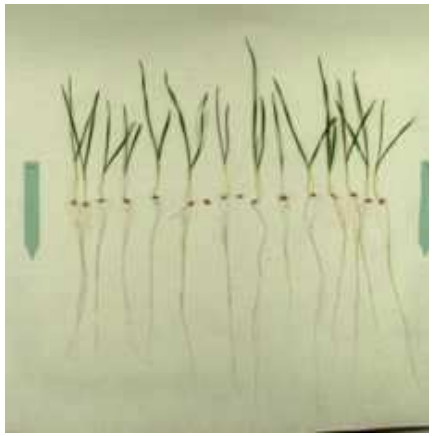


3 cm

6 cm

9 cm

Raxil®



Emergence & sowing depth - infected seeds

Initial evaluation

untreated

3 cm

6 cm

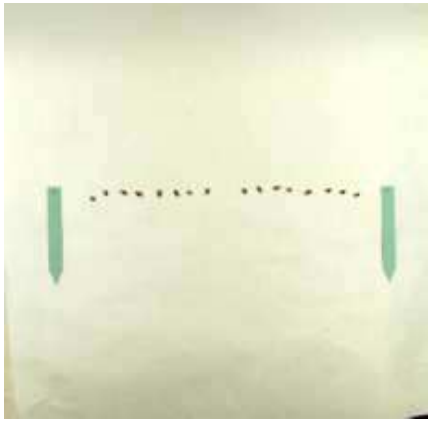
9 cm

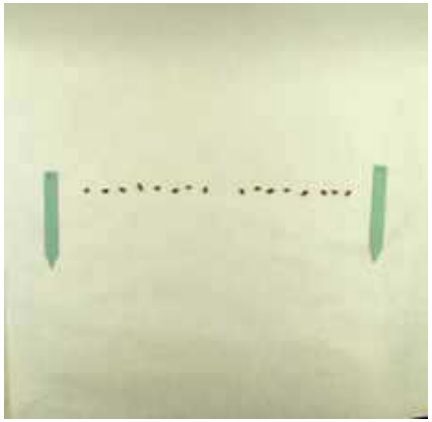
Raxil®

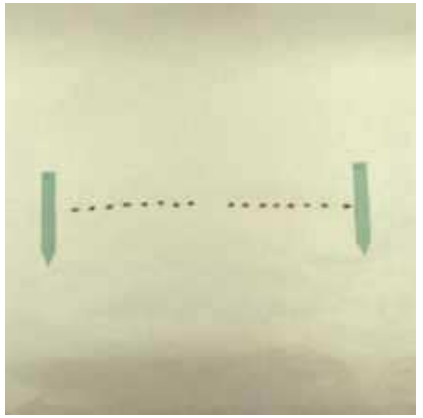
Emergence & sowing depth - infected seeds

Final stand

untreated





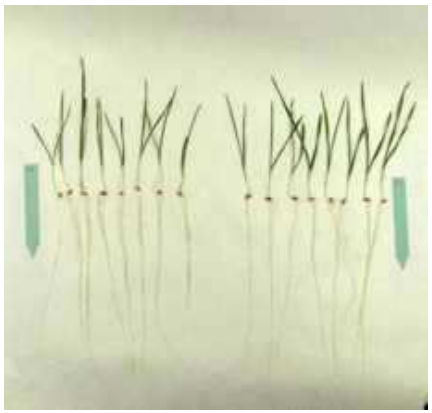


3 cm

6 cm

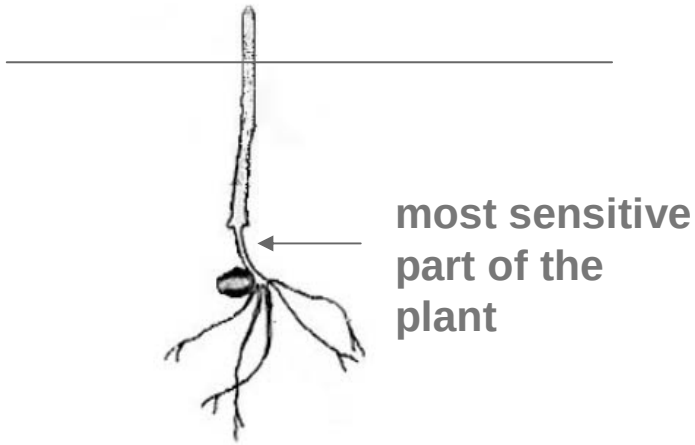
9 cm

Raxil®

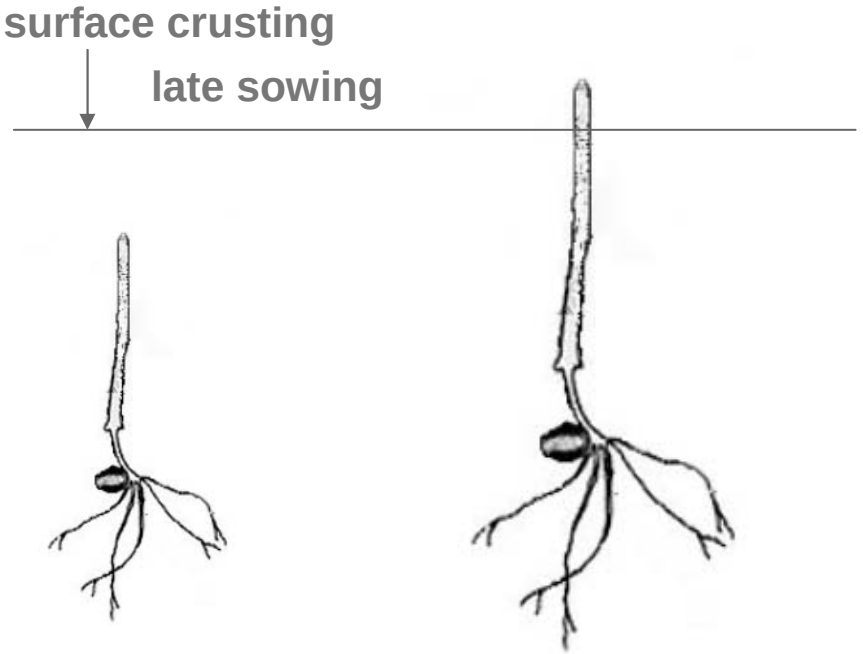


Emergence & sowing depth

Raxil®: Mesocotyl and coleoptile shorter and thicker



normal sowing



coleoptile length depends on the variety

deep sowing

Conclusions

- Cereal plants may be damage by diseases showing different types of epidemiology
- Seed- and soil-borne diseases can be targeted by classical seed treatment compounds
- Systemic properties are required to control pathogens present in the seed embryo or in the soil
- Extended protection against air-borne diseases requires highly systemic compounds, able to be translocated in the whole plant
- Fungicide seed treatments do not only control diseases but show additionally beneficial effect on plant physiology

Science For A Better Life

Thank you !