South American Agriculture and Farmers

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Acknowledgments

Farmers, consultants

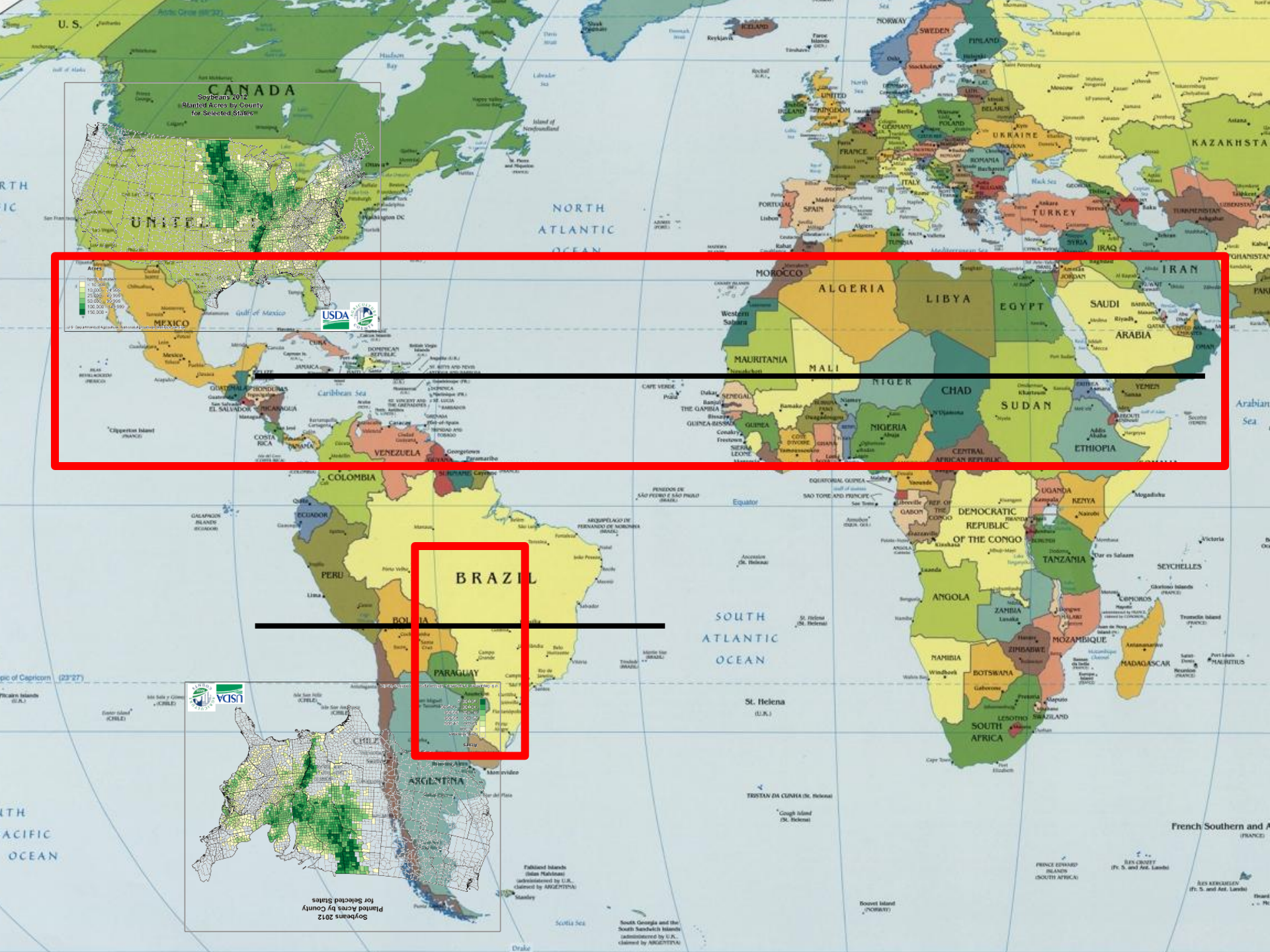
Embrapa…

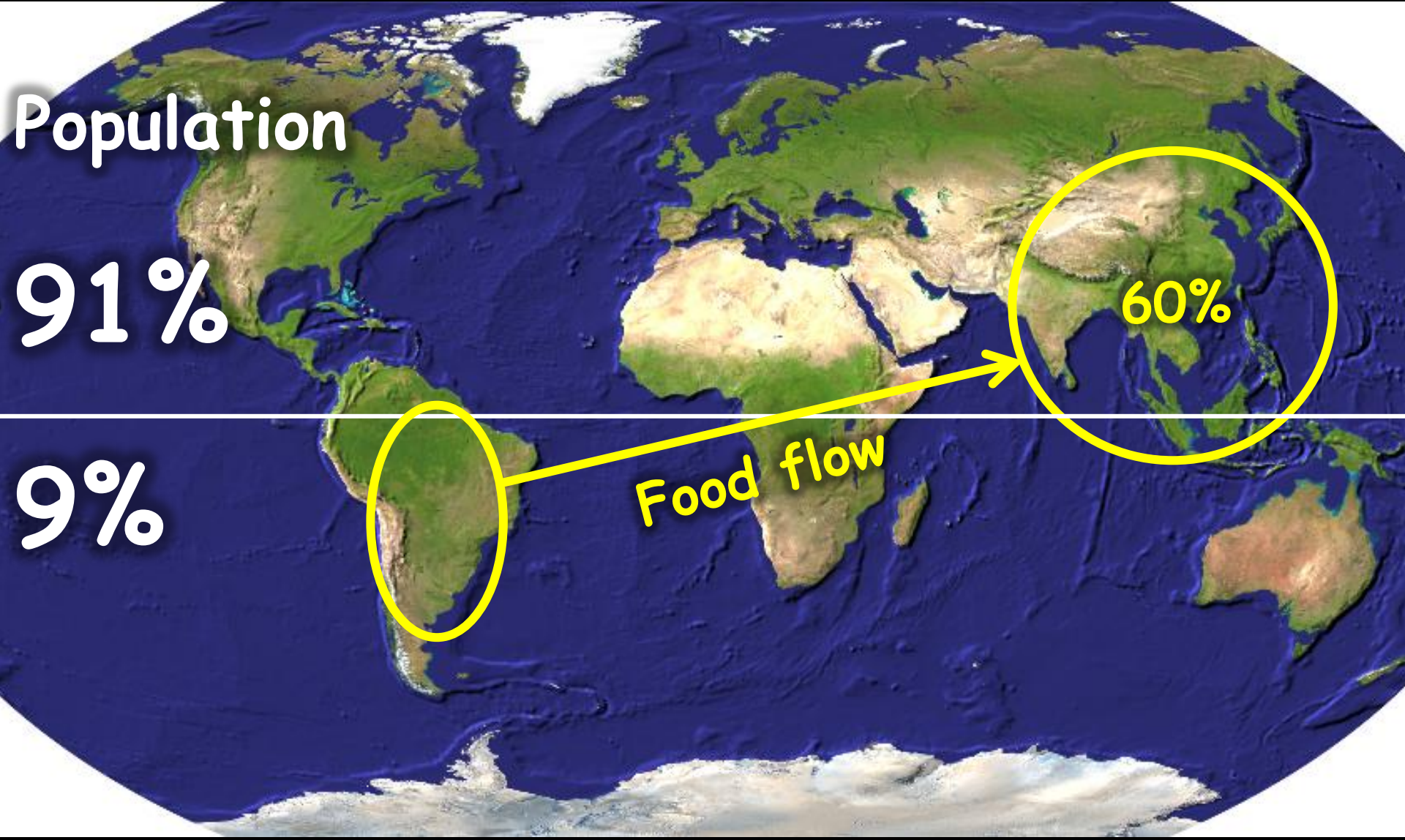
Universities

Private research

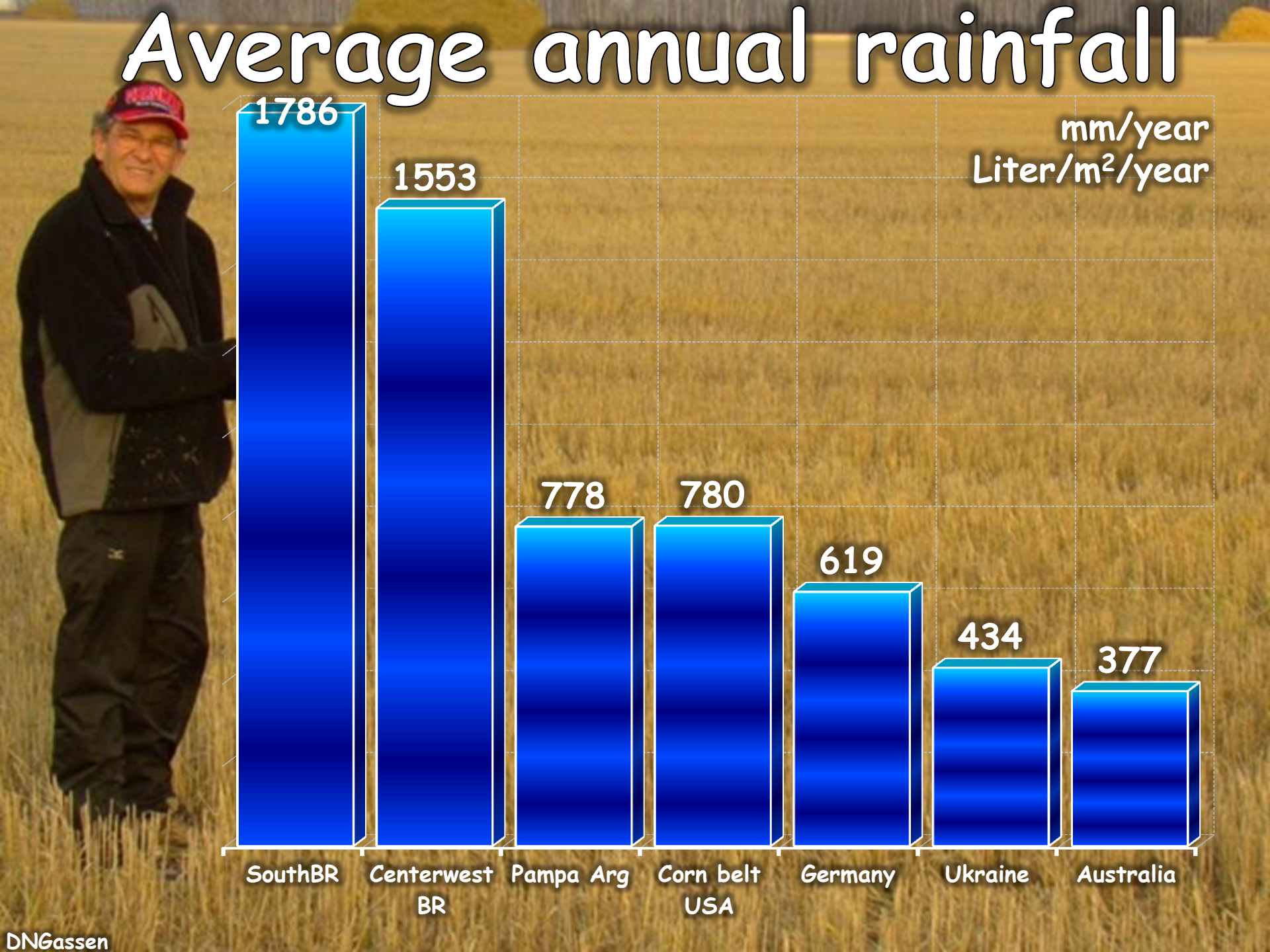
Industry

IRAC


CANADA
Soybeans 2012
Planted Acres by County
for Selected States
UNITED
Acres
USDA
MEXICO
Gulf of Mexico
Caribbean Sea
NORTH
ATLANTIC
OCEAN
SOUTH
ATLANTIC
OCEAN
BRAZIL
PARAGUAY
ARGENTINA
CHILE
BOLIVIA
PERU
COLOMBIA
ECUADOR
VENEZUELA
GUYANA
SURINAME
Equator
Soybeans 2012
Planted Acres by County
for Selected States
MOROCCO
ALGERIA
LIBYA
EGYPT
MAURITANIA
MALI
NIGER
CHAD
SUDAN
NIGERIA
ETHIOPIA
SAUDI
ARABIA
IRAN
TURKEY
SYRIA
IRAQ
KAZAKHSTA
UKRAINE
FRANCE
SPAIN
PORTUGAL
NORWAY
SWEDEN
FINLAND
ICELAND
DEMOCRATIC
REPUBLIC
OF THE CONGO
ANGOLA
TANZANIA
KENYA
UGANDA
ZAMBIA
ZIMBABWE
MOZAMBIQUE
NAMIBIA
BOTSWANA
SOUTH
AFRICA
MADAGASCAR
St. Helena
TRISTAN DA CUNHA (St. Helena)
French Southern and A


Population
91%
9%
60%
Food flow

Average annual rainfall



DNGassen

One kg soybean

- 60 g N
- 50 g PKSCaMgFeMoCu...
- 1000 liter water

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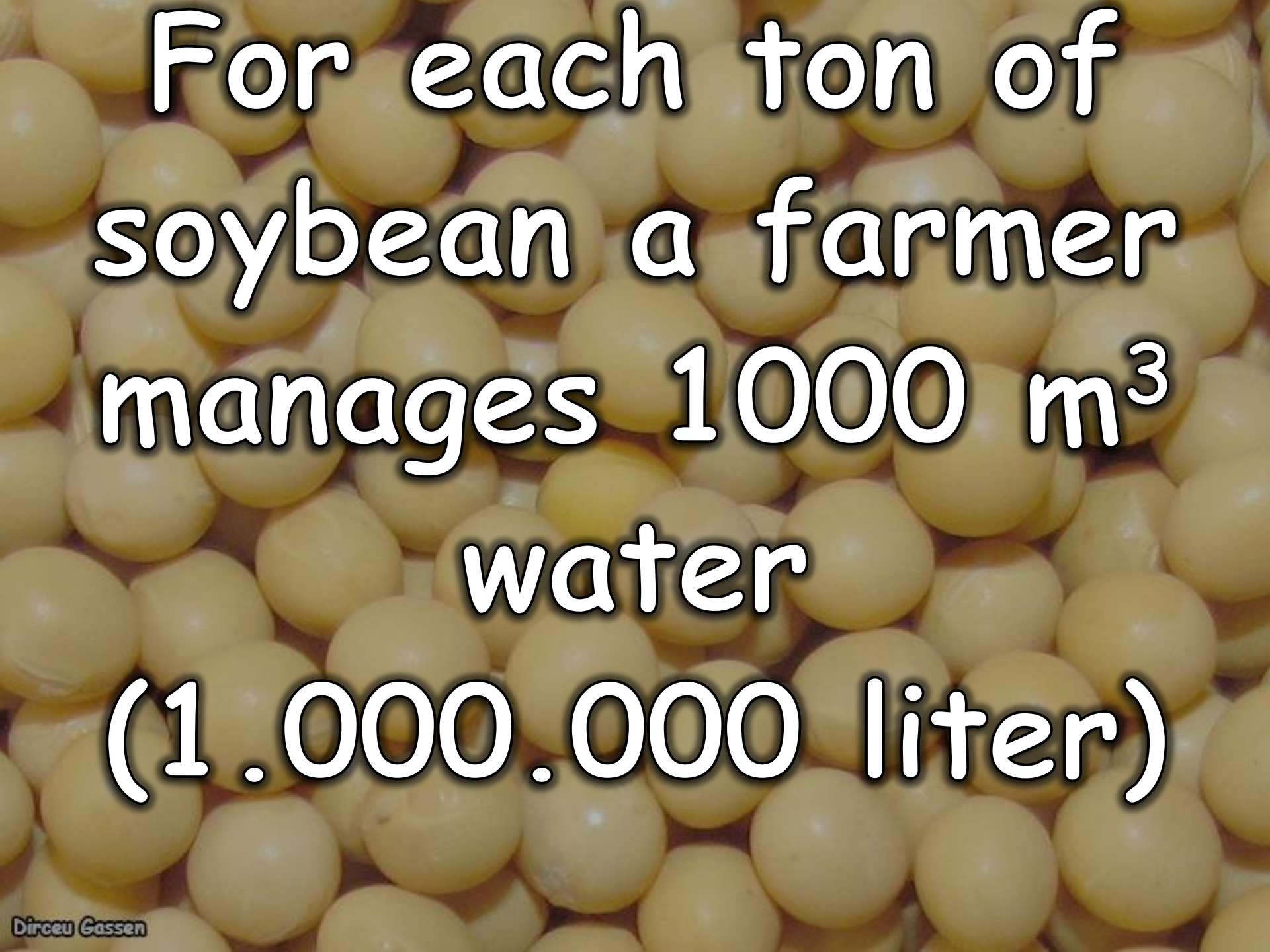
For each ton of soybean a farmer manages 1000 m³ water (1.000.000 liter)
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Ethical
responsibilities
to provide food
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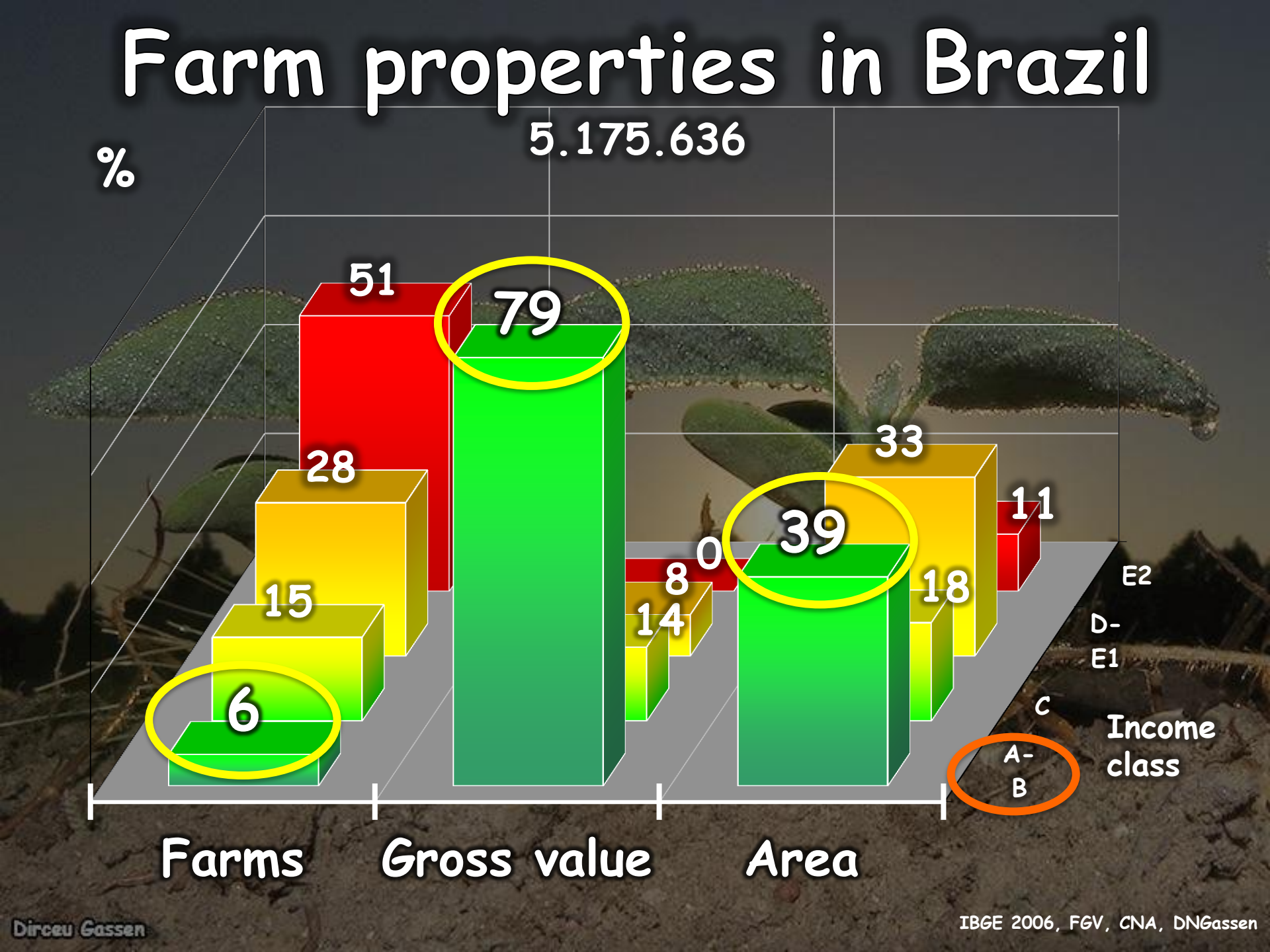
Farm properties in Brazil



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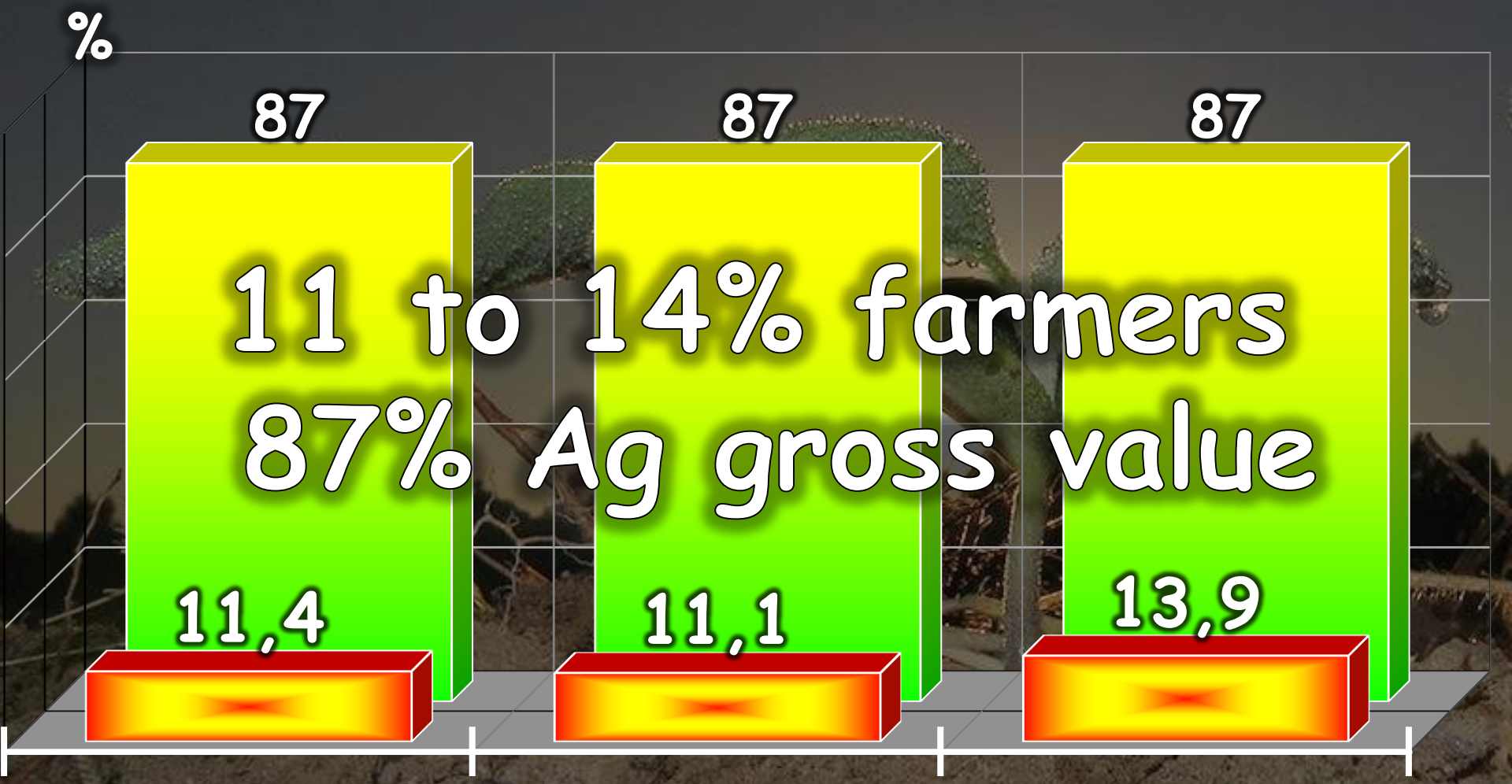
IBGE 2006, FGV, CNA, DNGassen

Farmers and gross value



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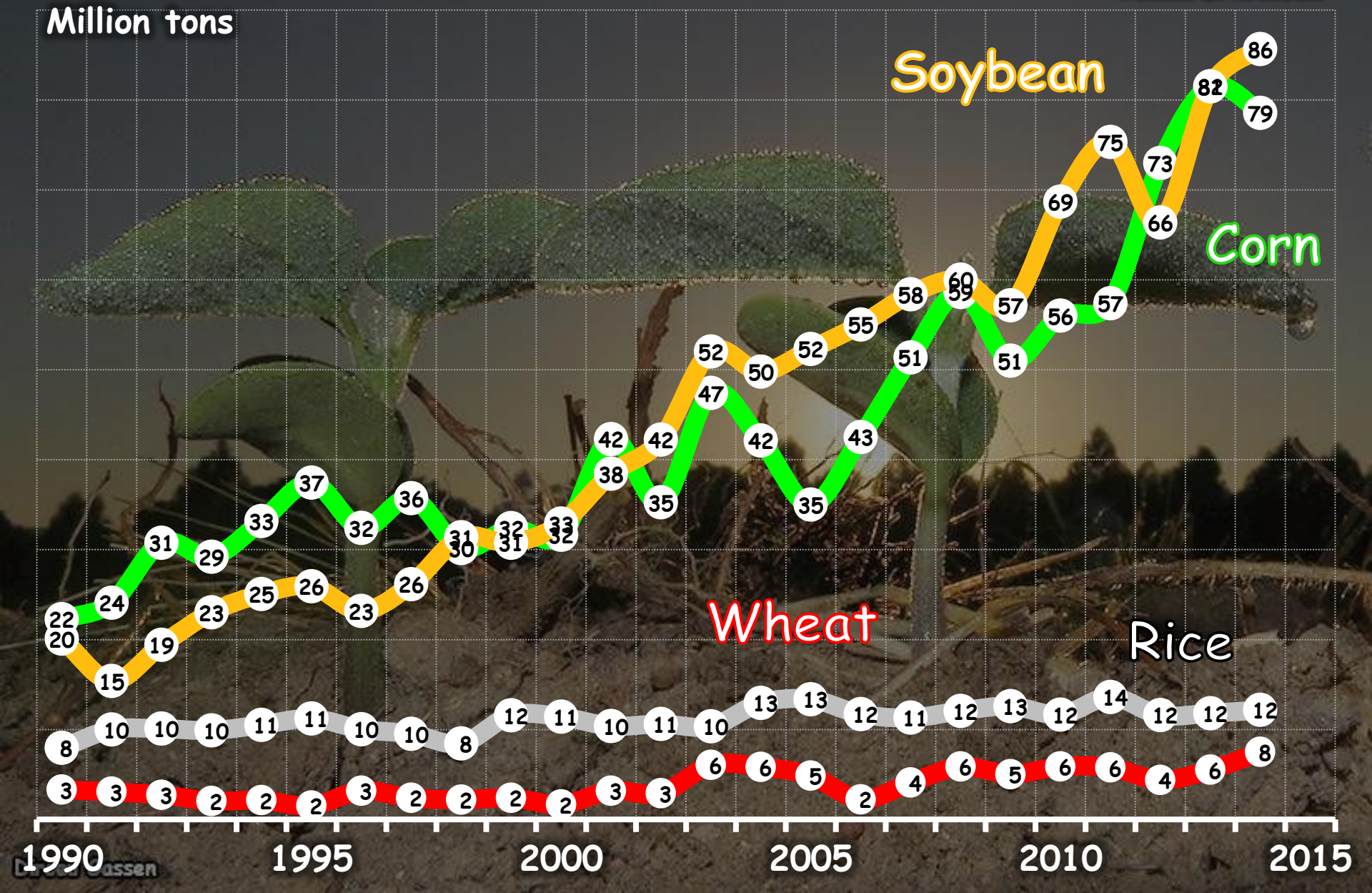
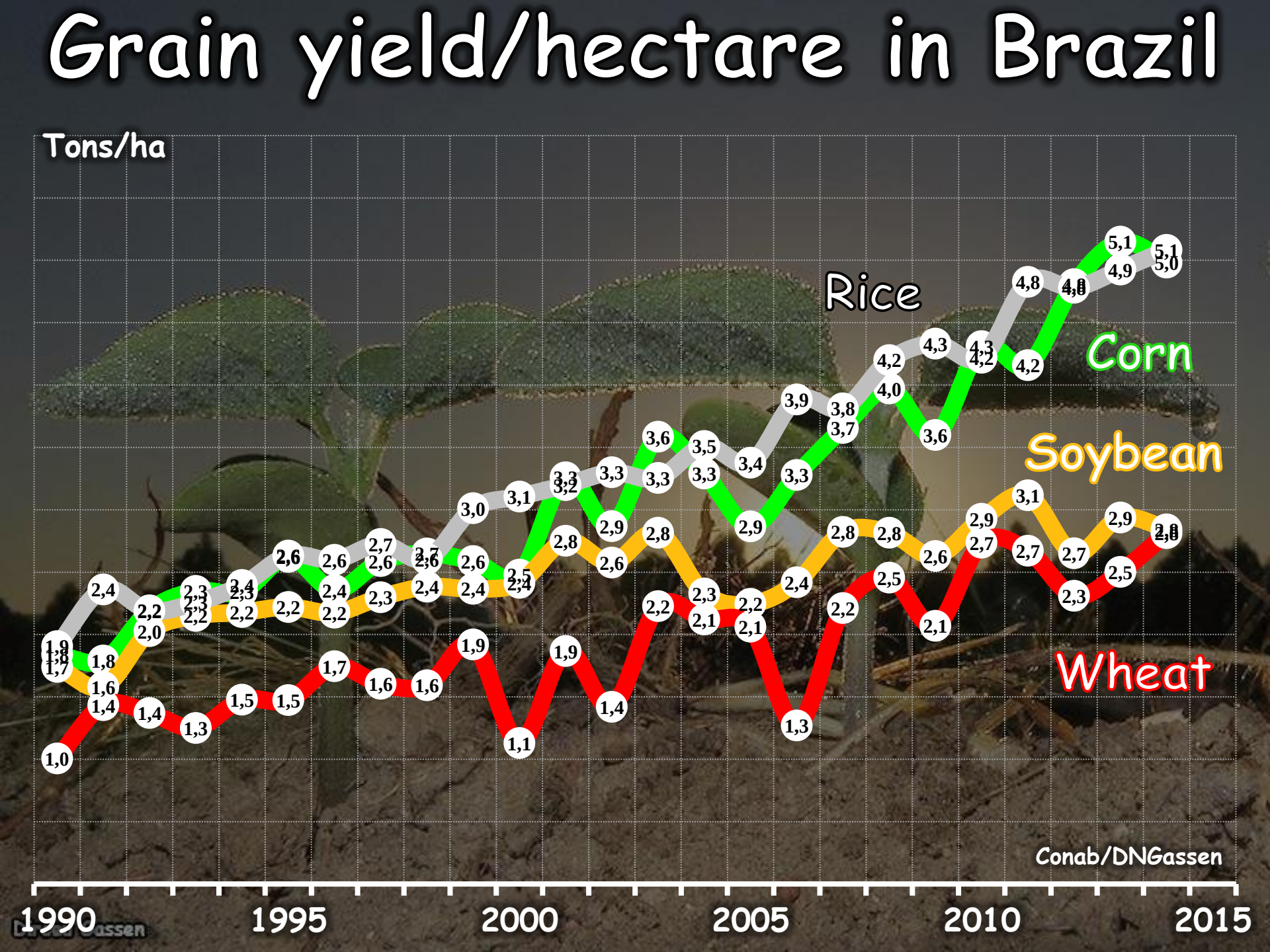
FAO

Grain production in Brazil

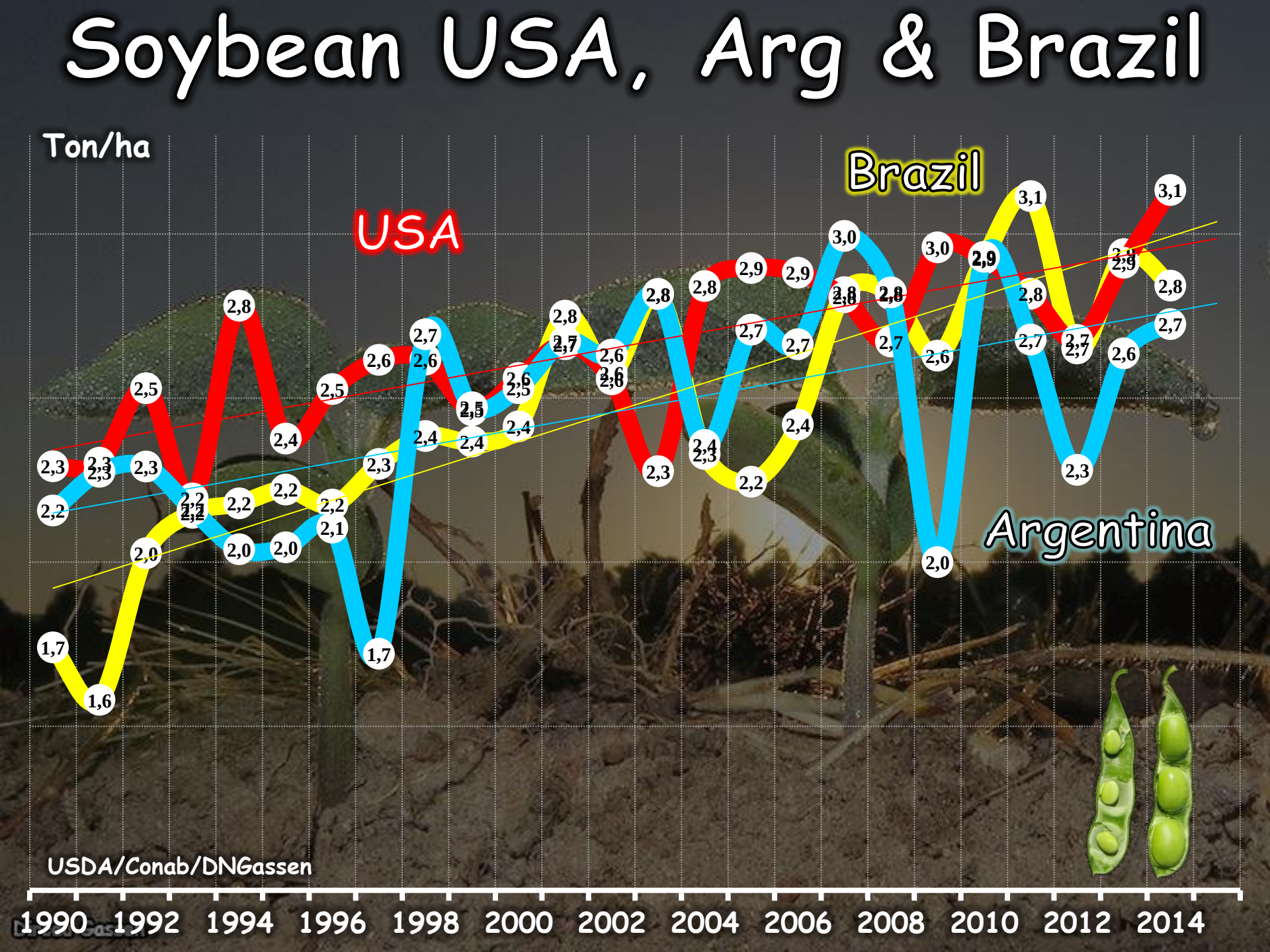
Conab/DNGassen



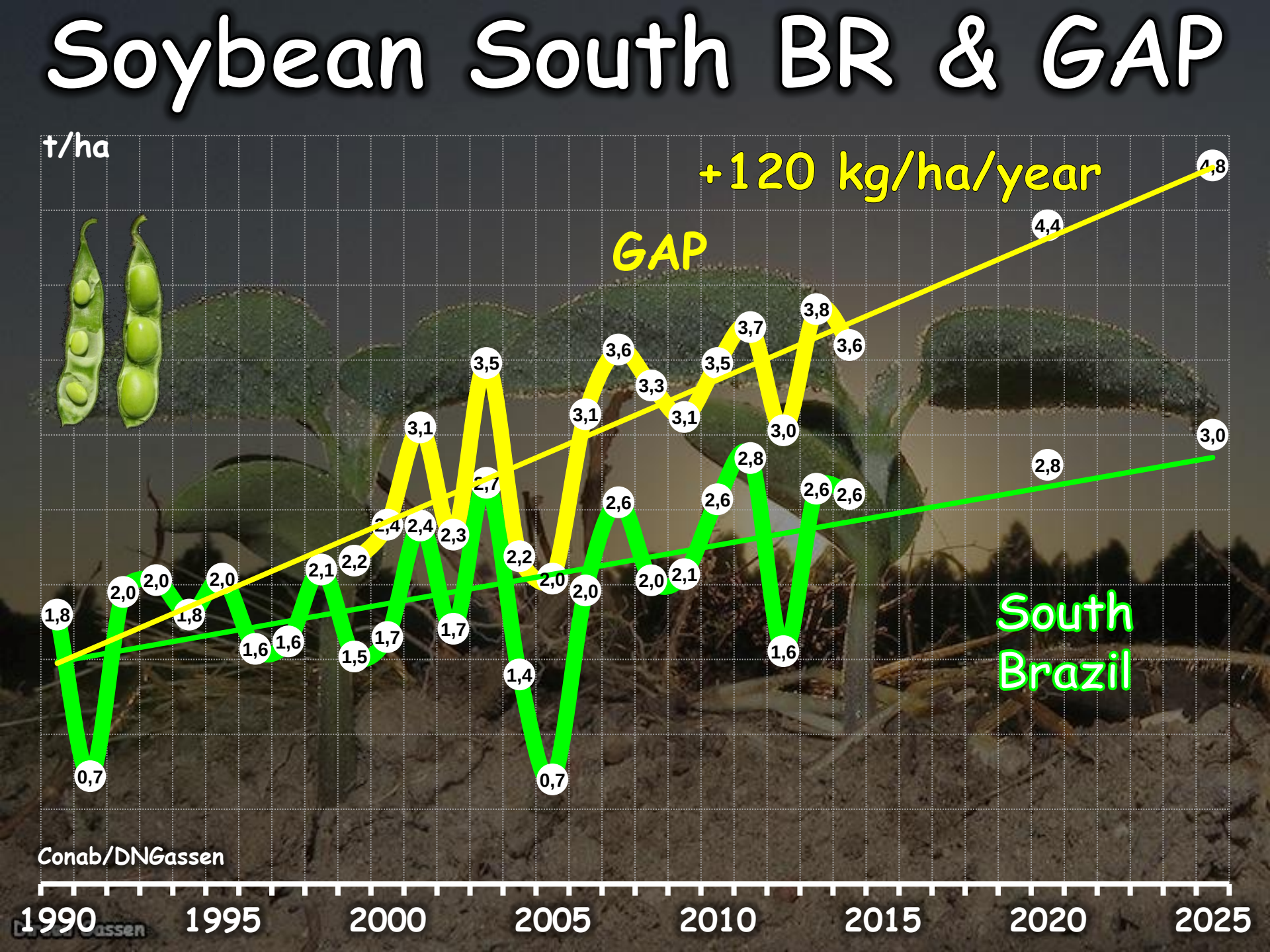
Grain yield/hectare in Brazil



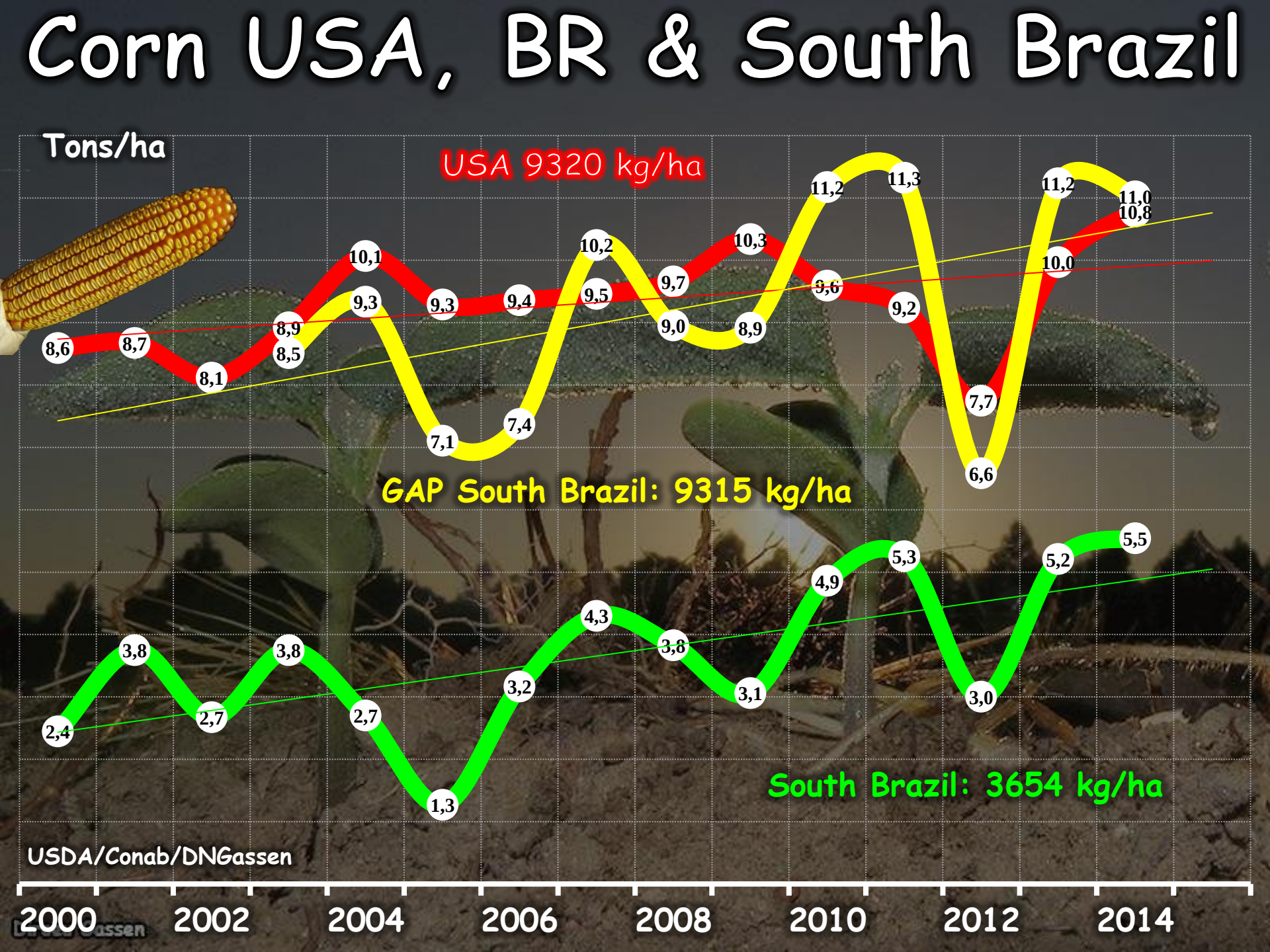
Soybean USA, Arg & Brazil



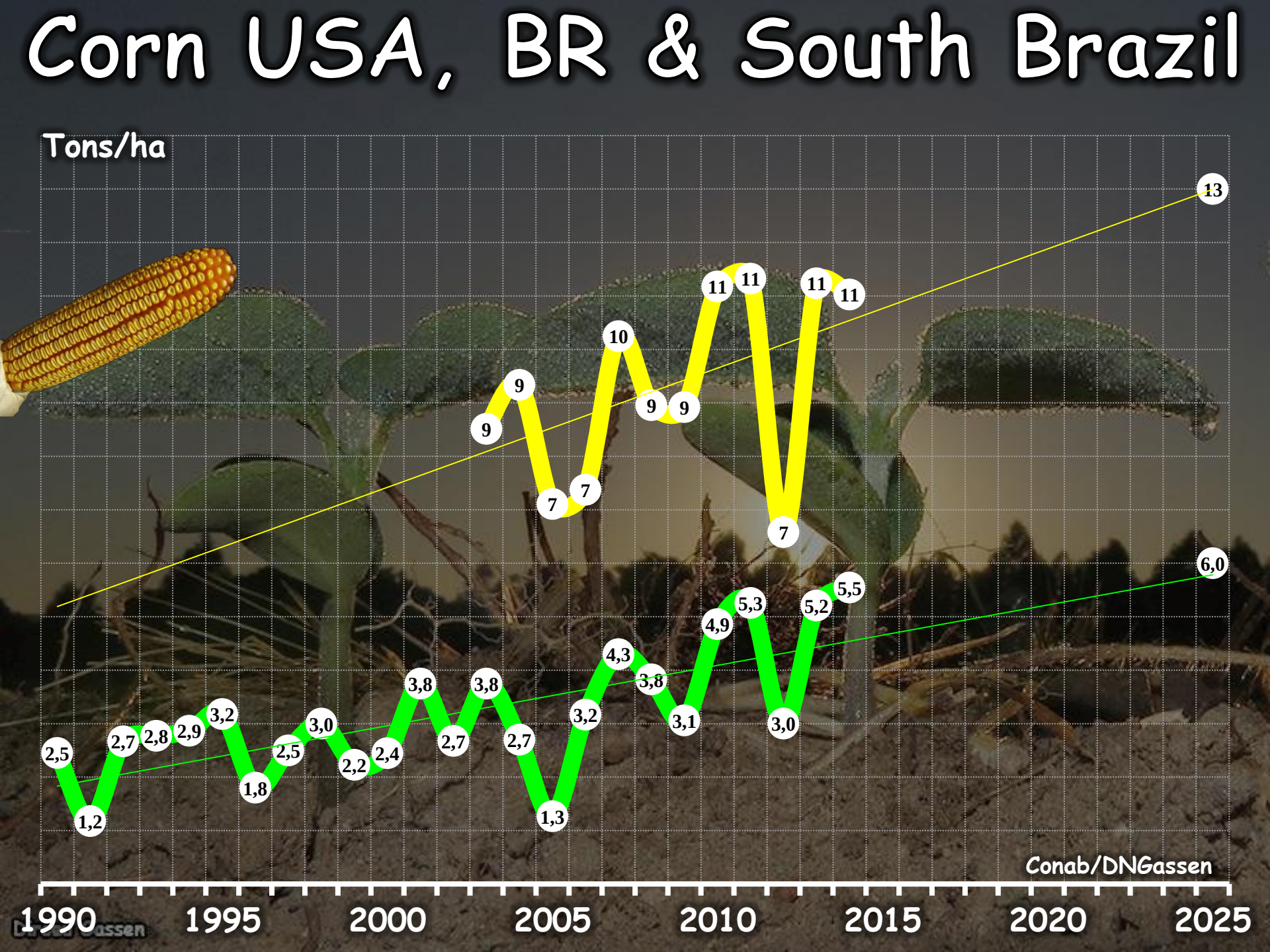
Soybean South BR & GAP



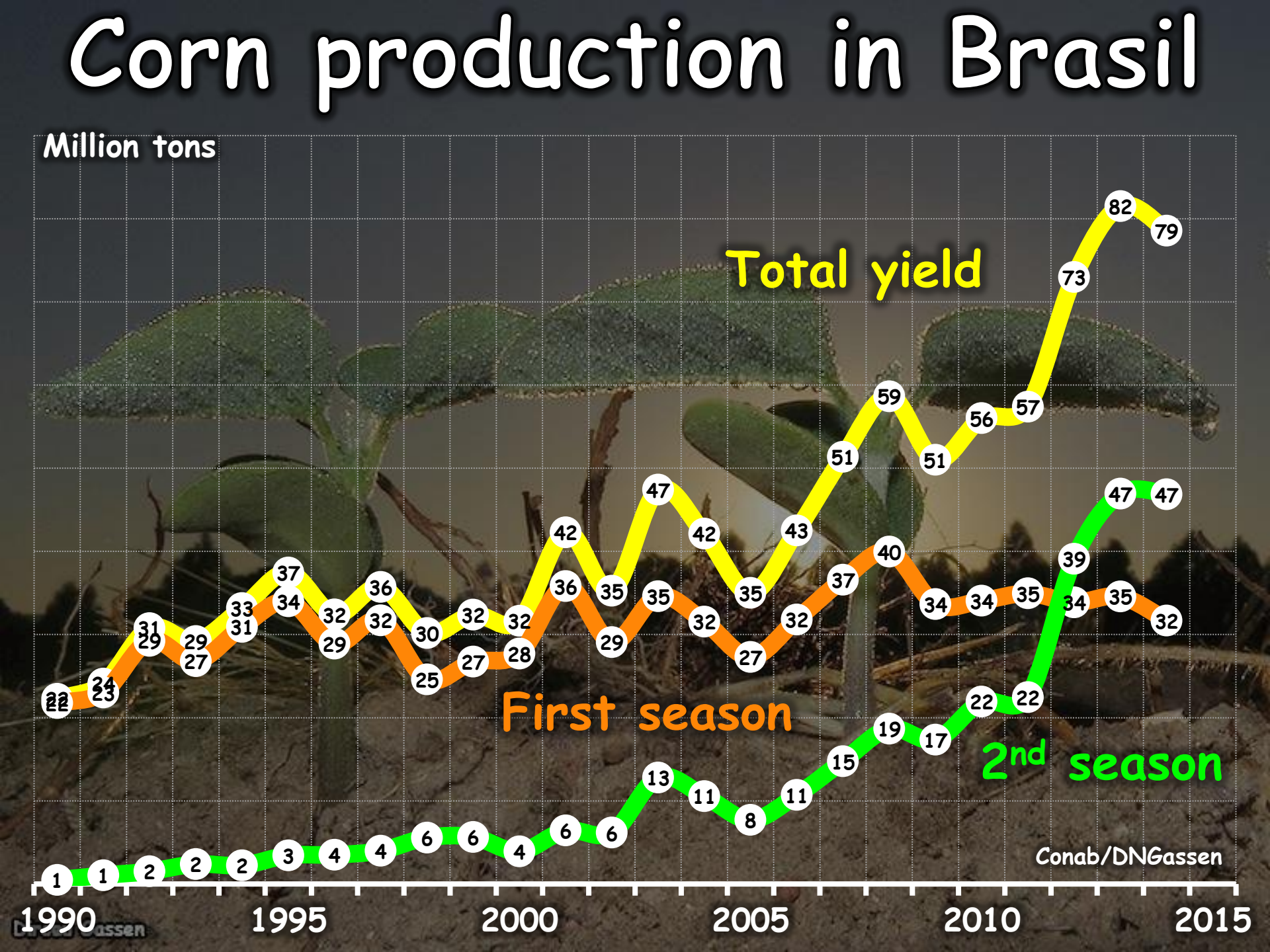
Corn USA, BR & South Brazil



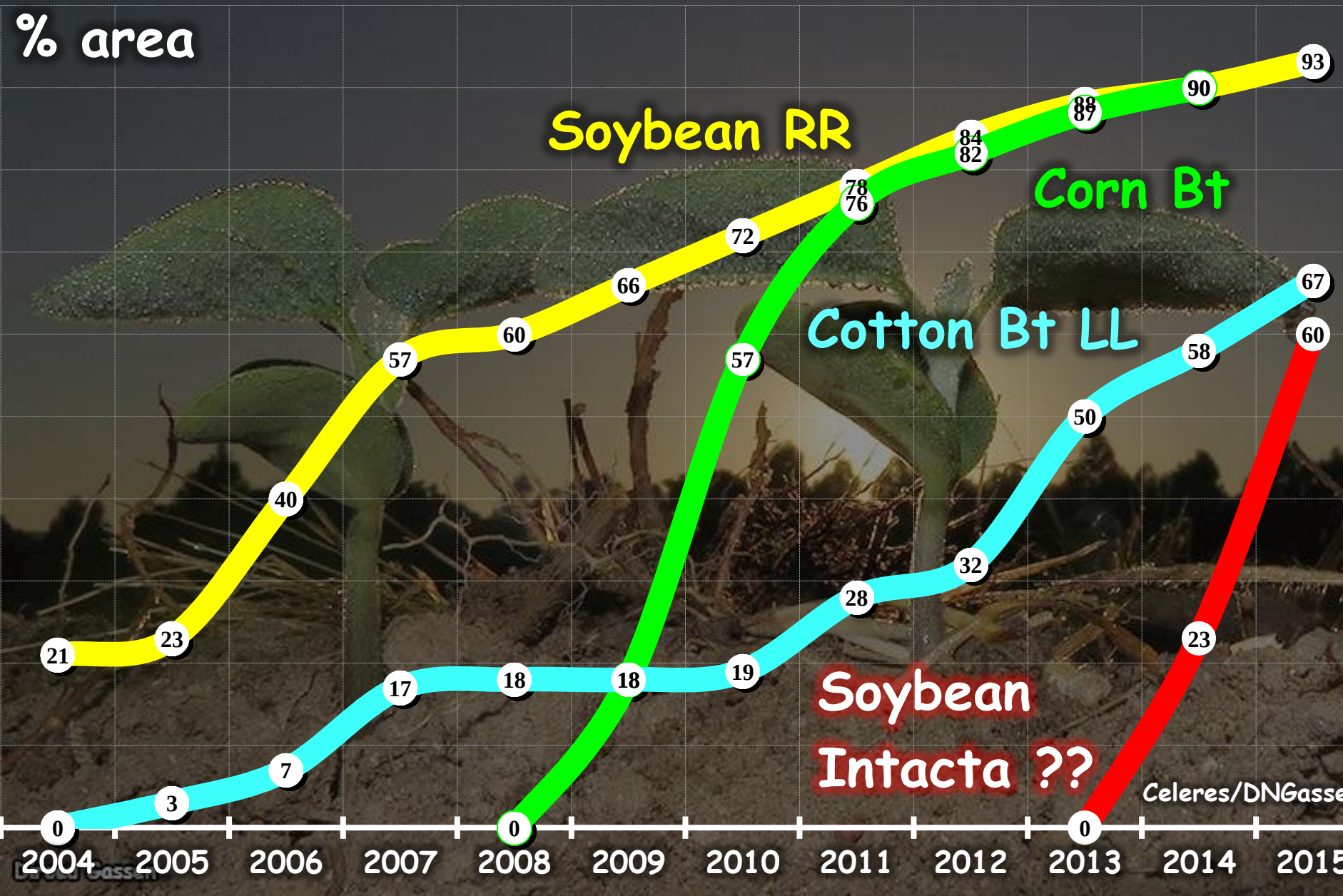
Corn USA, BR & South Brazil



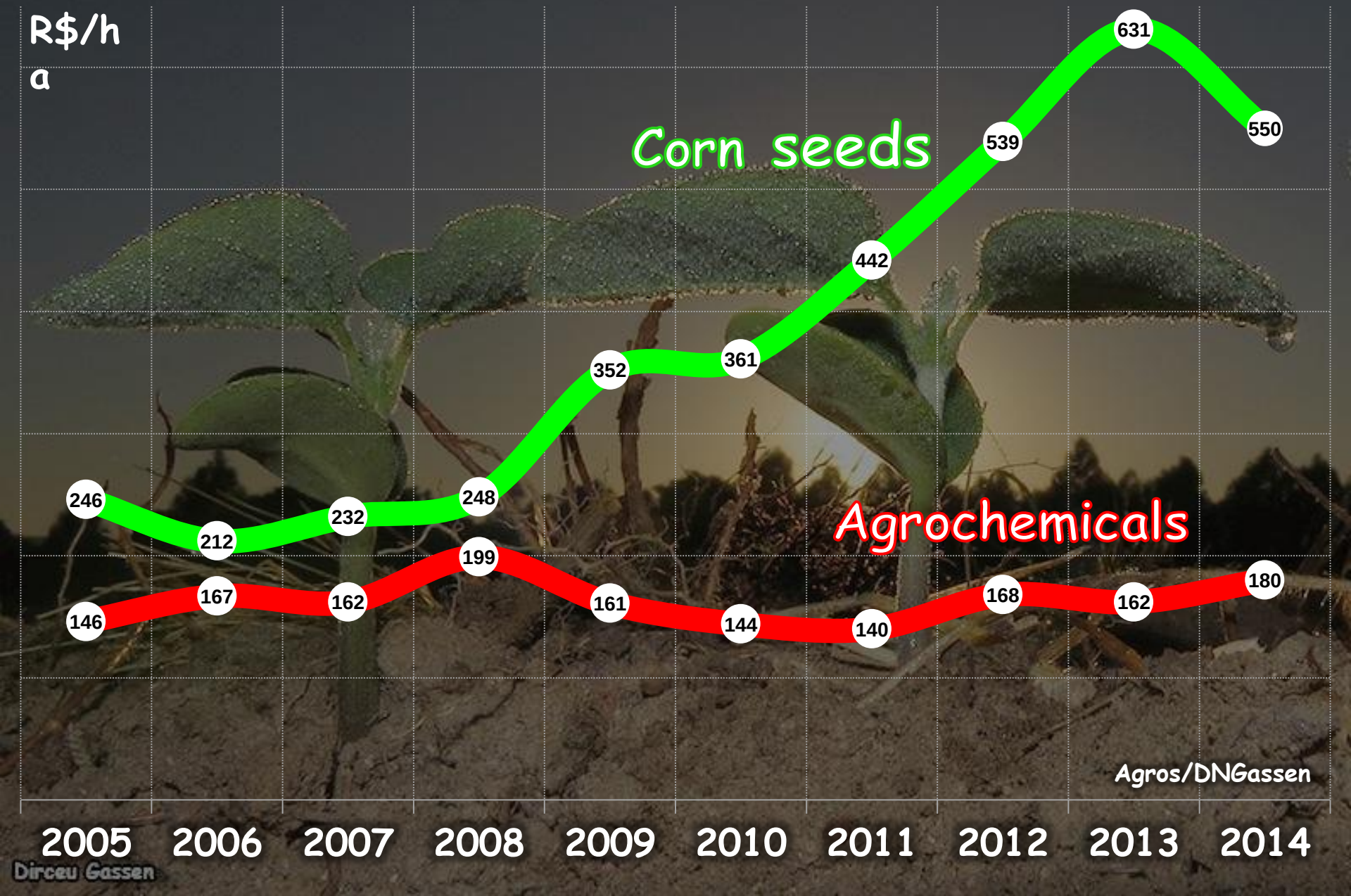
Corn production in Brasil



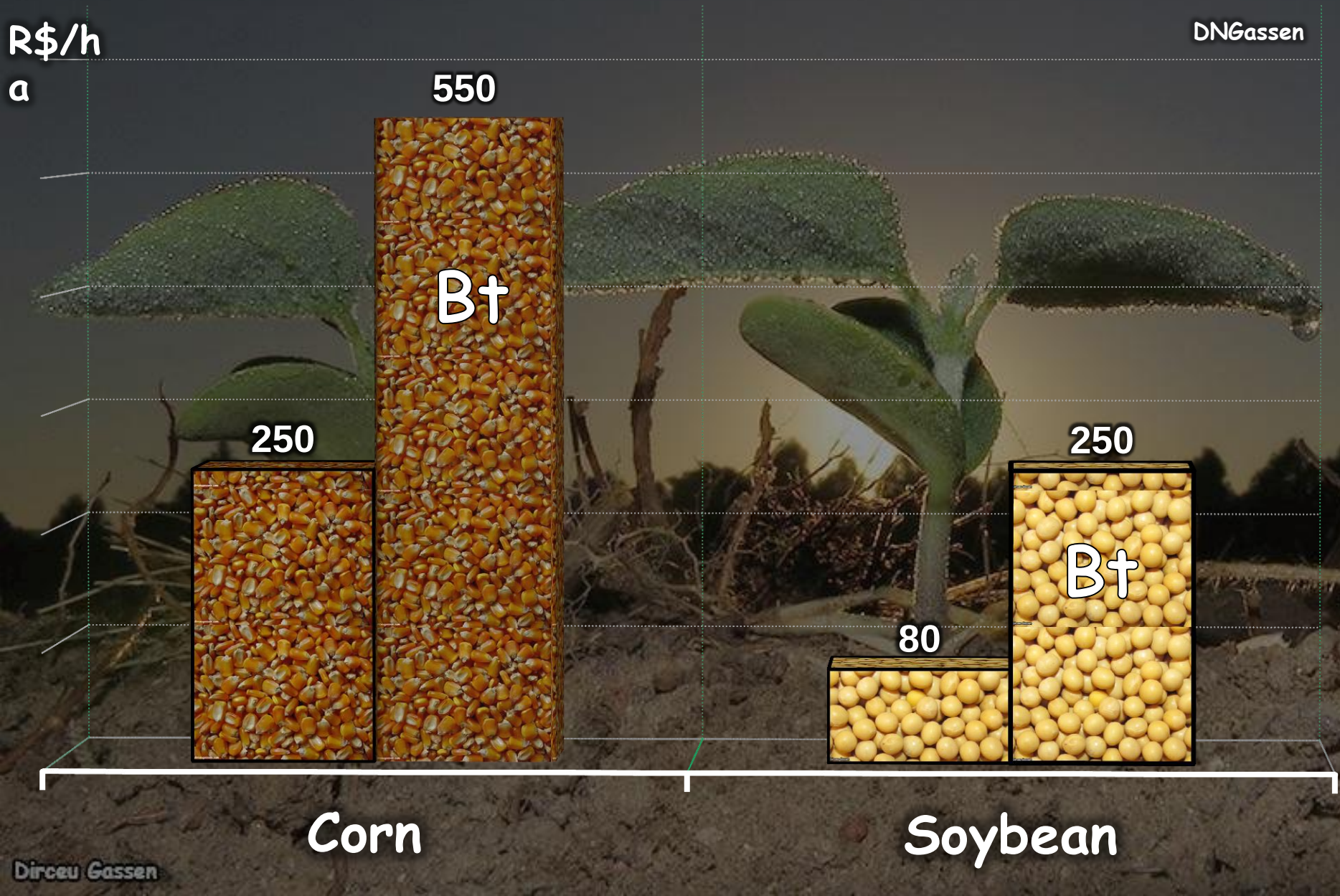
Adoption of GM crops in Brazil



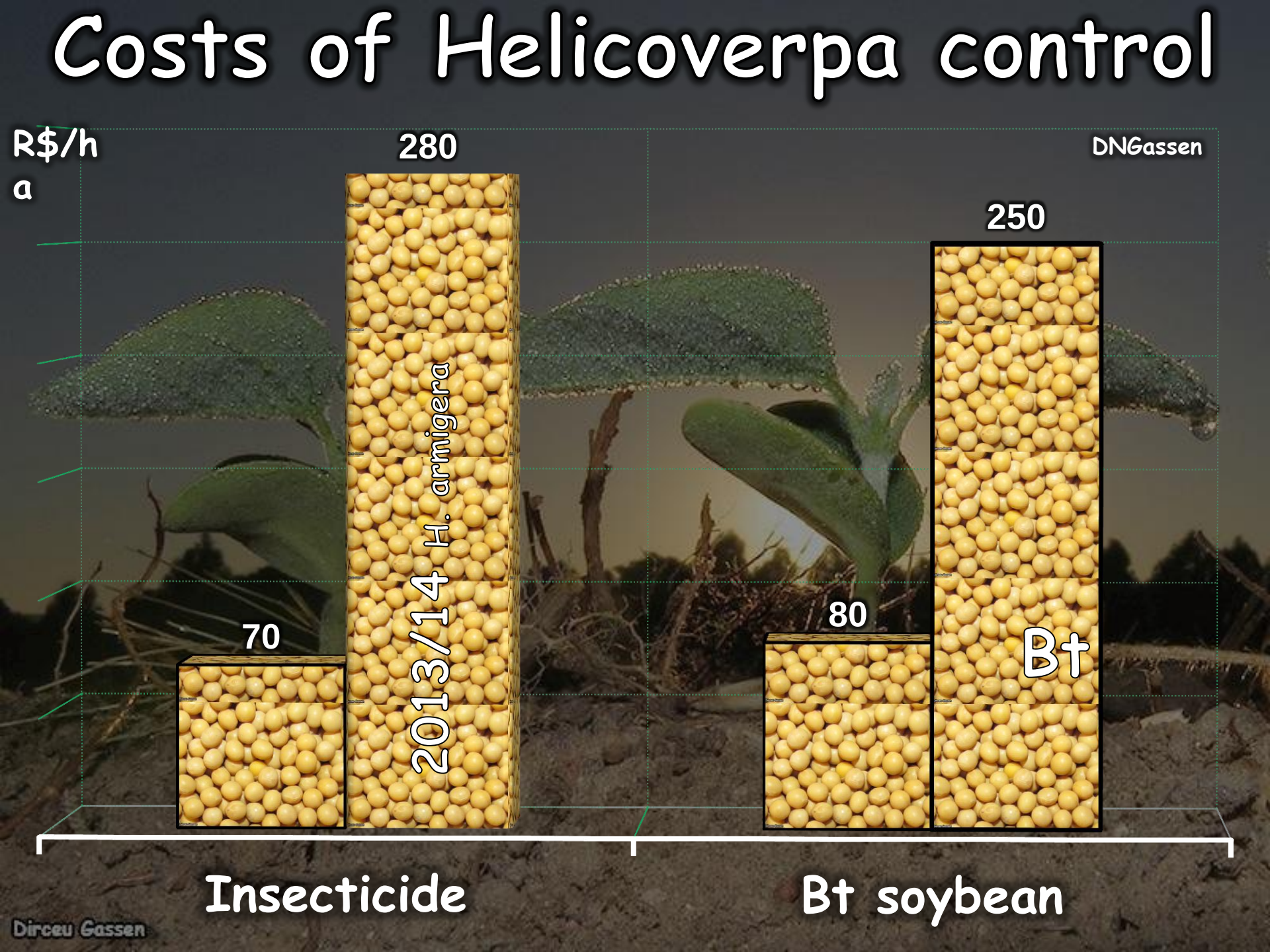
Costs of seeds & agrochemicals



Corn and soybean seed costs

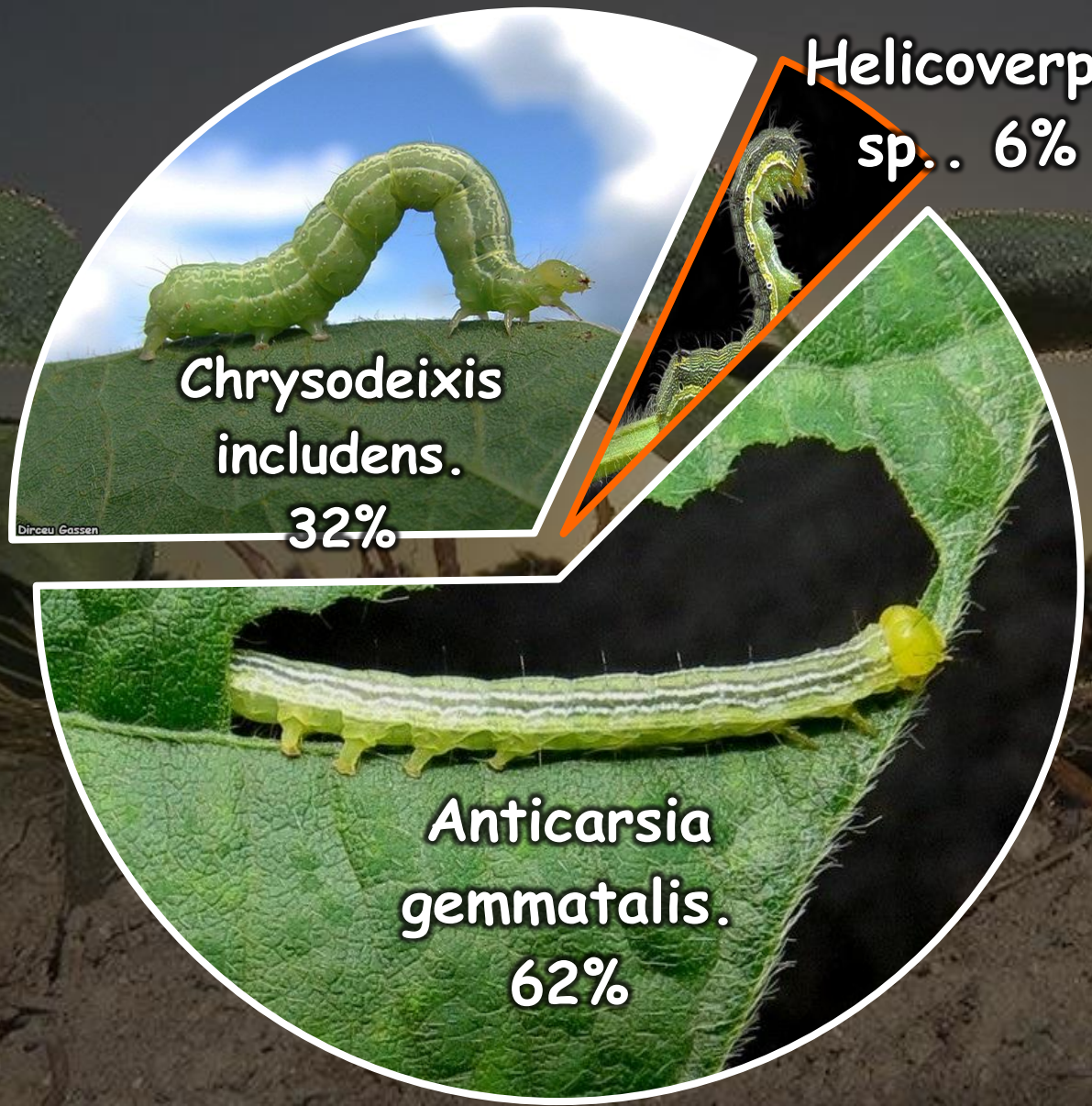


Costs of Helicoverpa control



Caterpilar in Soybean, West PR

Conte et al. 2014



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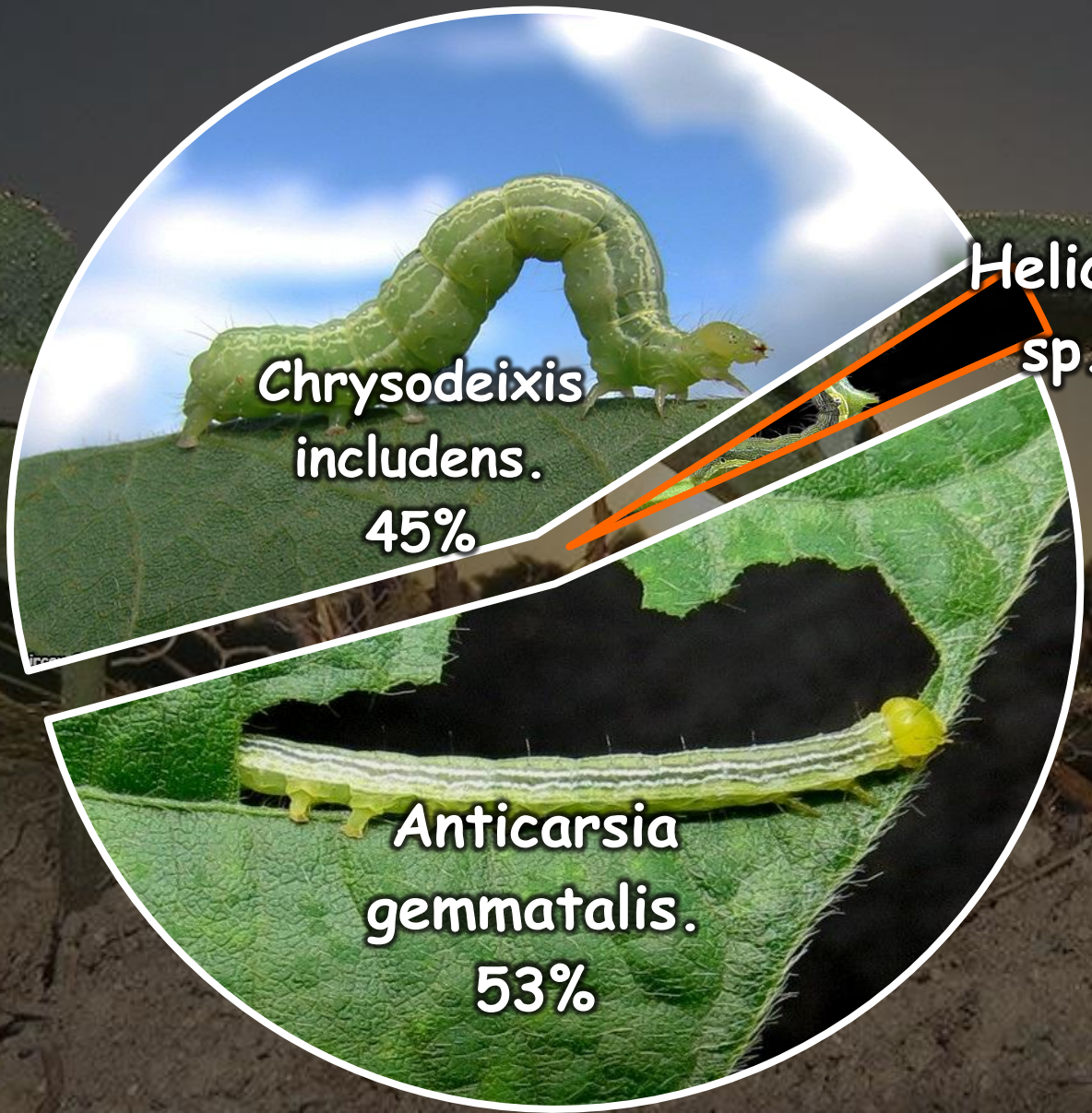
Caterpilar in soybean, Nort PR

Conte et al. 2014



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Convencional
Soja Bt
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Convencional Bt soybean

Anticarsia gemmatalis
Chrysodeixis includens
Helicoverpa armigera
Heliothis virescens
Helicoverpa gelotopoeon
Helicoverpa zea
Epinotia aporema
Omiodes indicata
Elasmopalpus lignosellus

Spodoptera cosmiodes
Spodoptera eridanea
Spodoptera frugiperda


New pests on soybean?


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Corn refuge area?

- 6% seed no Bt
- Less then 1%

Corn Bt refuge

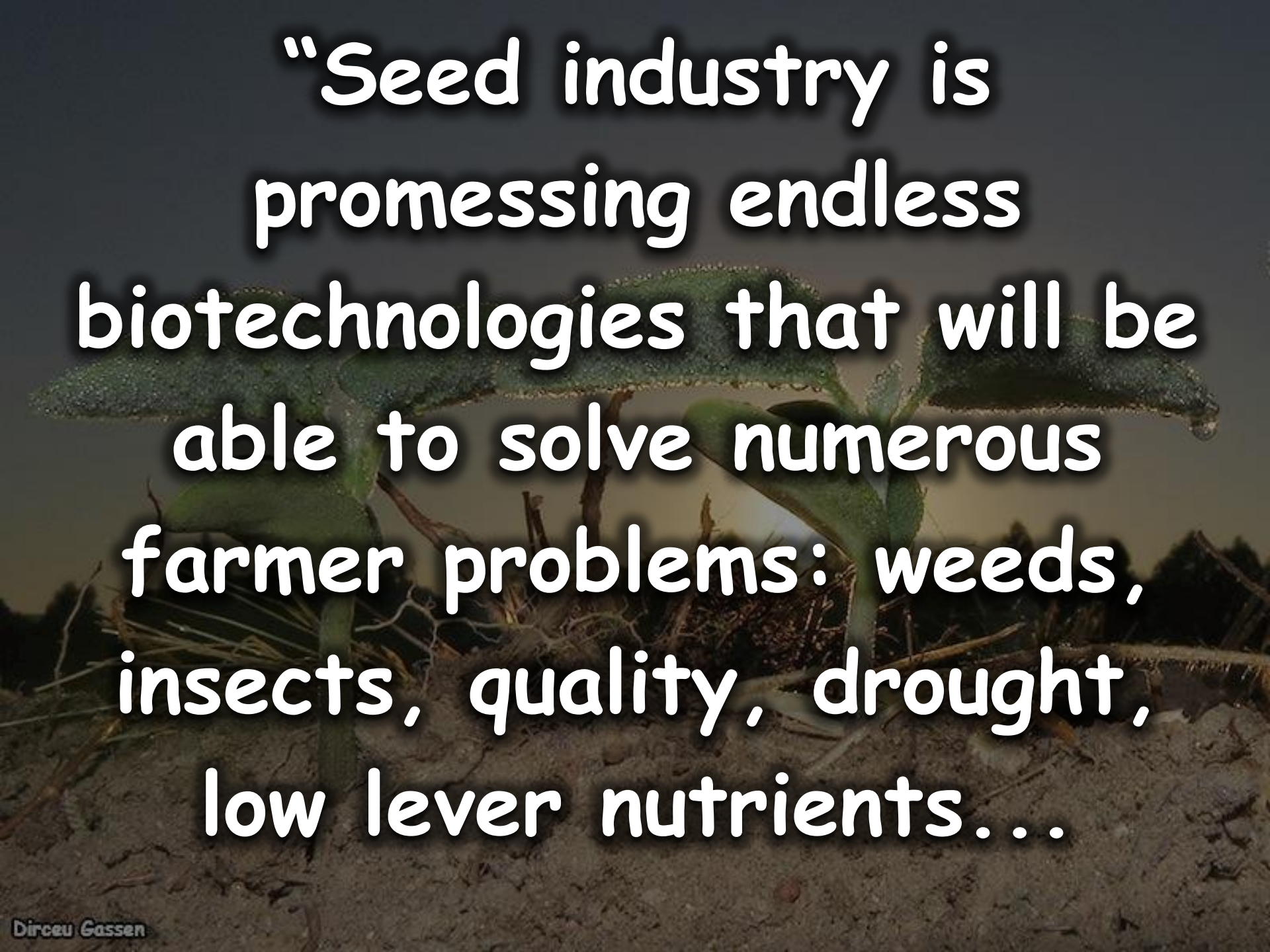
- US$ 60.oo/ha Bt seed
- 10% refuge

50% plants with damage, 30% yield loss: 1,5% total area.

7 tons/ha: 105 kg/ha: 12 US$
10 tons/ha: 150 kg/ha: 16 US$

Farmers conclusion

- New technology is there
- I am paying for it
- It isn't my problem
- Science, consultants, seed industry should solve it.


"Seed industry is promessing endless biotechnologies that will be able to solve numerous farmer problems: weeds, insects, quality, drought, low lever nutrients...
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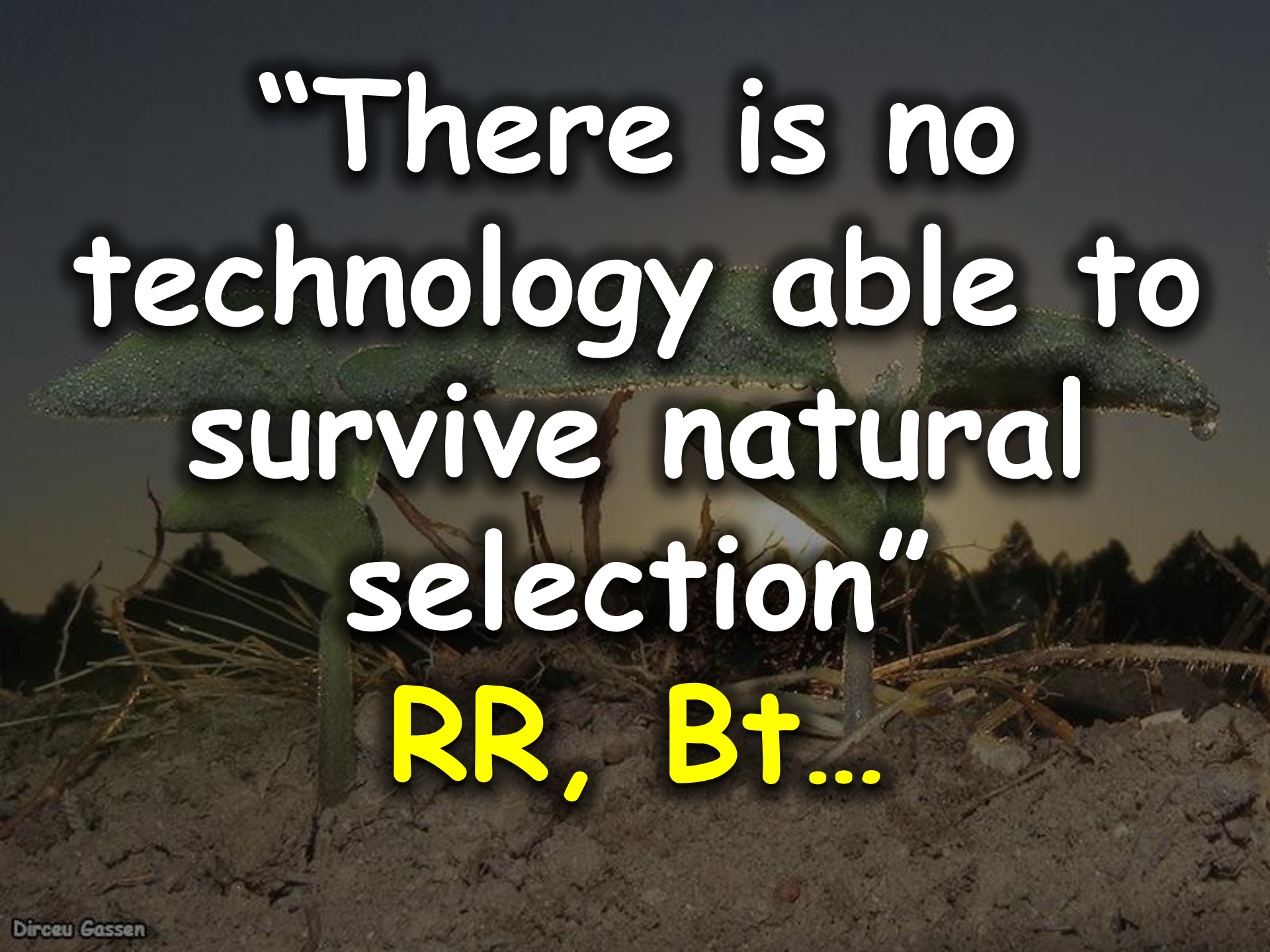
Science consensus

Continuos use of the same, crop, variaty or Chemical, resistance is inevitable

However it can be managed

Omoto & Maia


"There is no technology able to survive natural selection"
RR, Bt...
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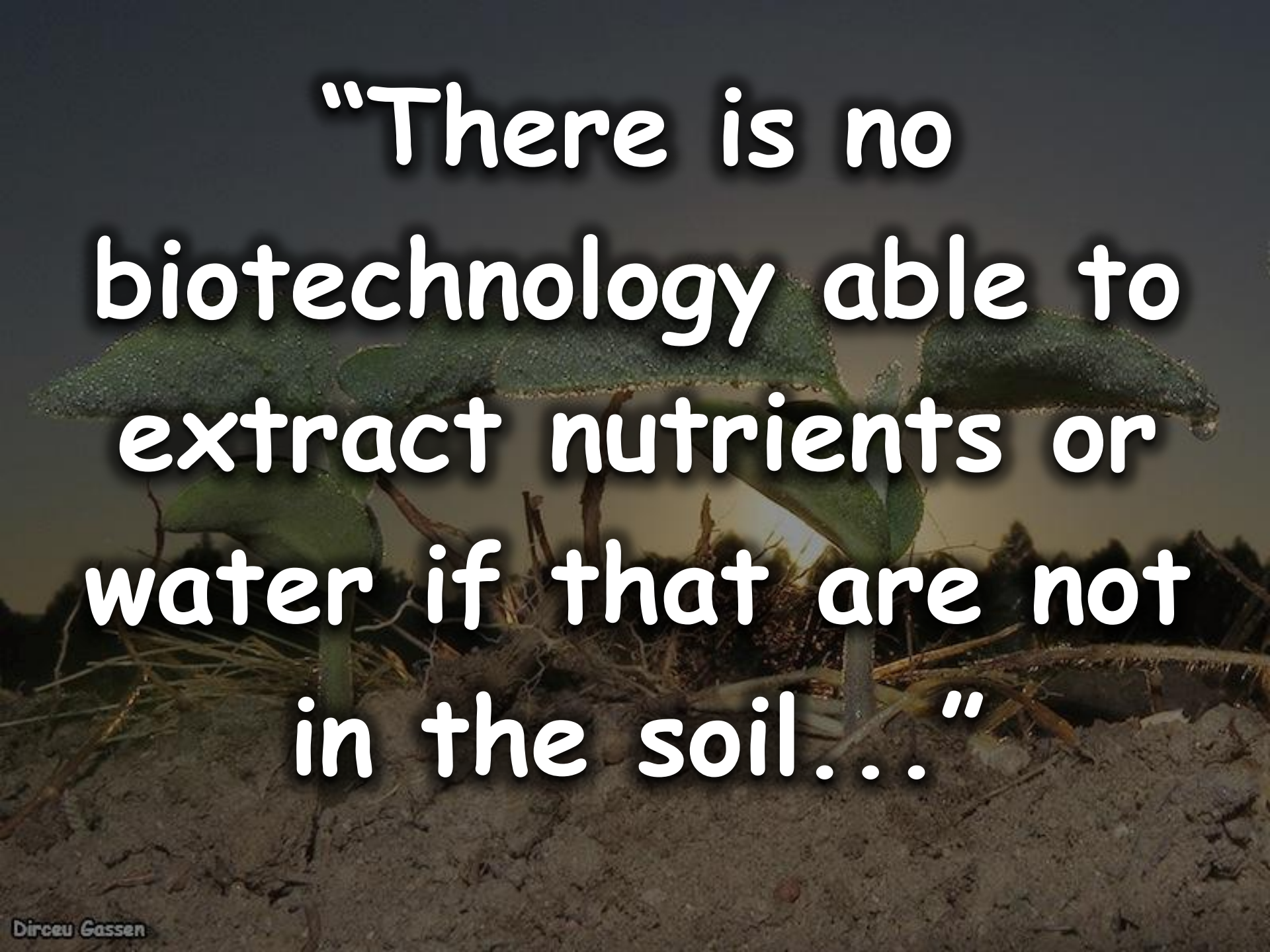
"There is no biotechnology able to extract nutrients or water if that are not in the soil..."
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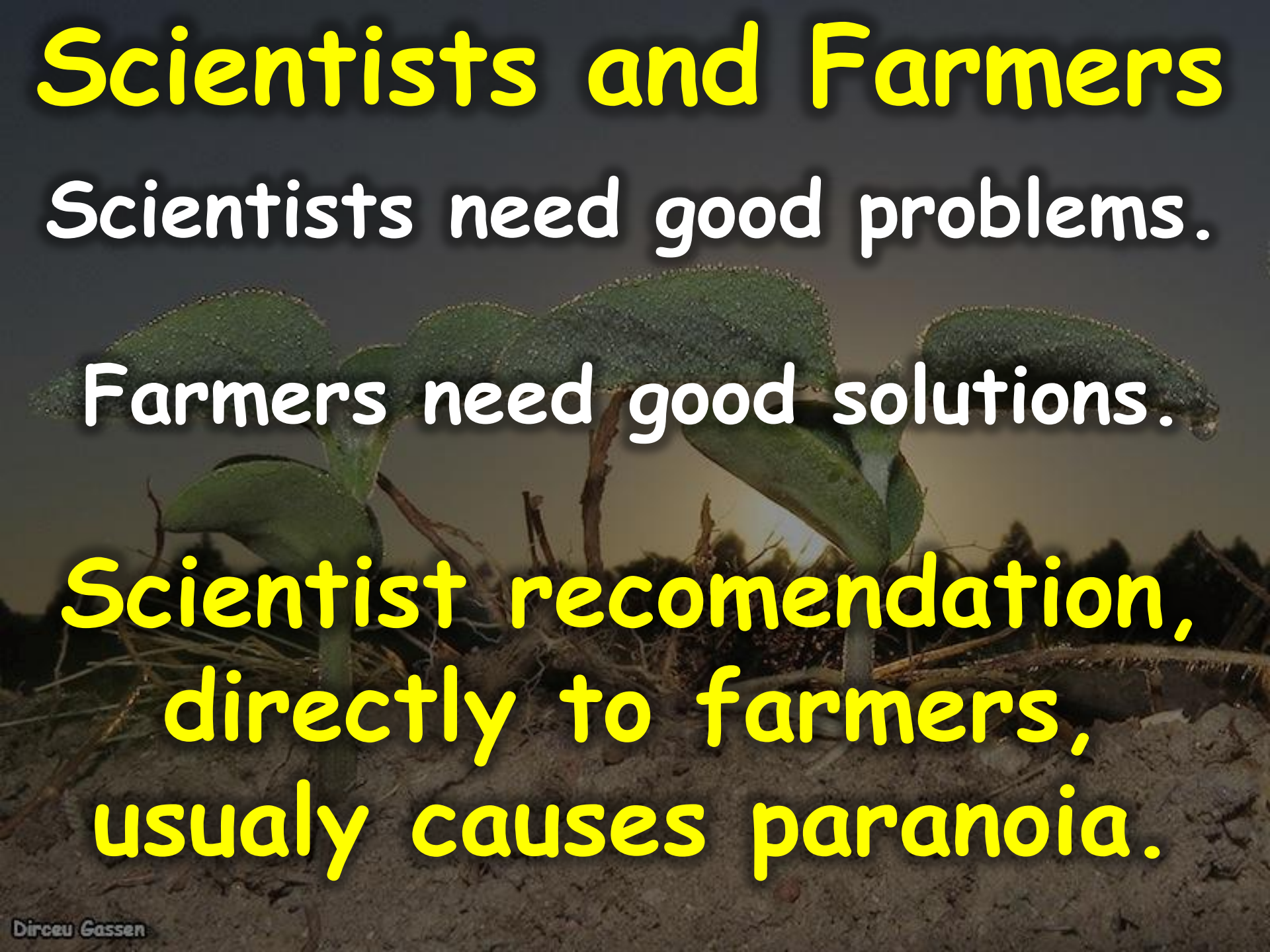
Scientists and Farmers

Scientists need good problems.

Farmers need good solutions.

Scientist recomendation, directly to farmers, usualy causes paranoia.



Science & knowledge

- Private: seeds, genetics, fertilizers, machinery, agrochemicals, grains, food industry, precision agriculture…

Science & knowledge

- Public science: no taxonomists, no population dynamics, no resistance monitoring, few basic science, regulation is for environment and health.

Science & knowledge

- Two Ministries for Agriculture:
- MAPA (Ministério da Agricultura...)
- MDA (Ministério do Desenvolvimento Agrário)

Corn & Soybean

- **New farmer:** Agronomy Schools, new interest for ag.
- **Past:** if you don't study, you are going to stay in farm.
- **Future:** if you want to farm, go to study.

Argentine soybean

- Brazil against OGM 2007
- Illegal use of RR soybean
- Arg. high soil fertility
- Arg. few pests & diseases
- Time for genetic studies

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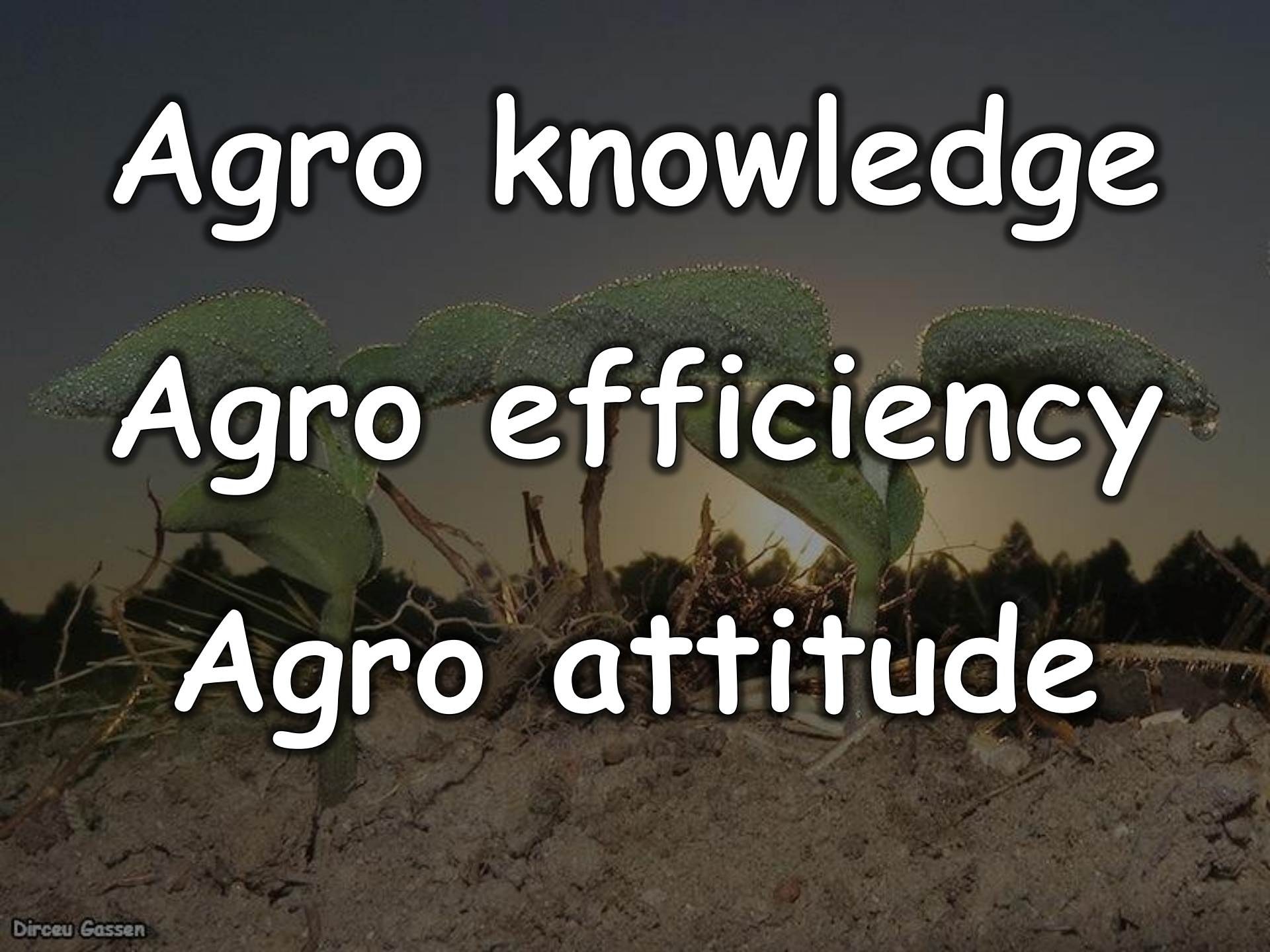
Brazil Tropical Ag

- Intensive biology
- New pests and diseases
- Agrochemicals
- Ants, rust, root diseases…
- Aphids… "r" strategists


Agro knowledge
Agro efficiency
Agro attitude
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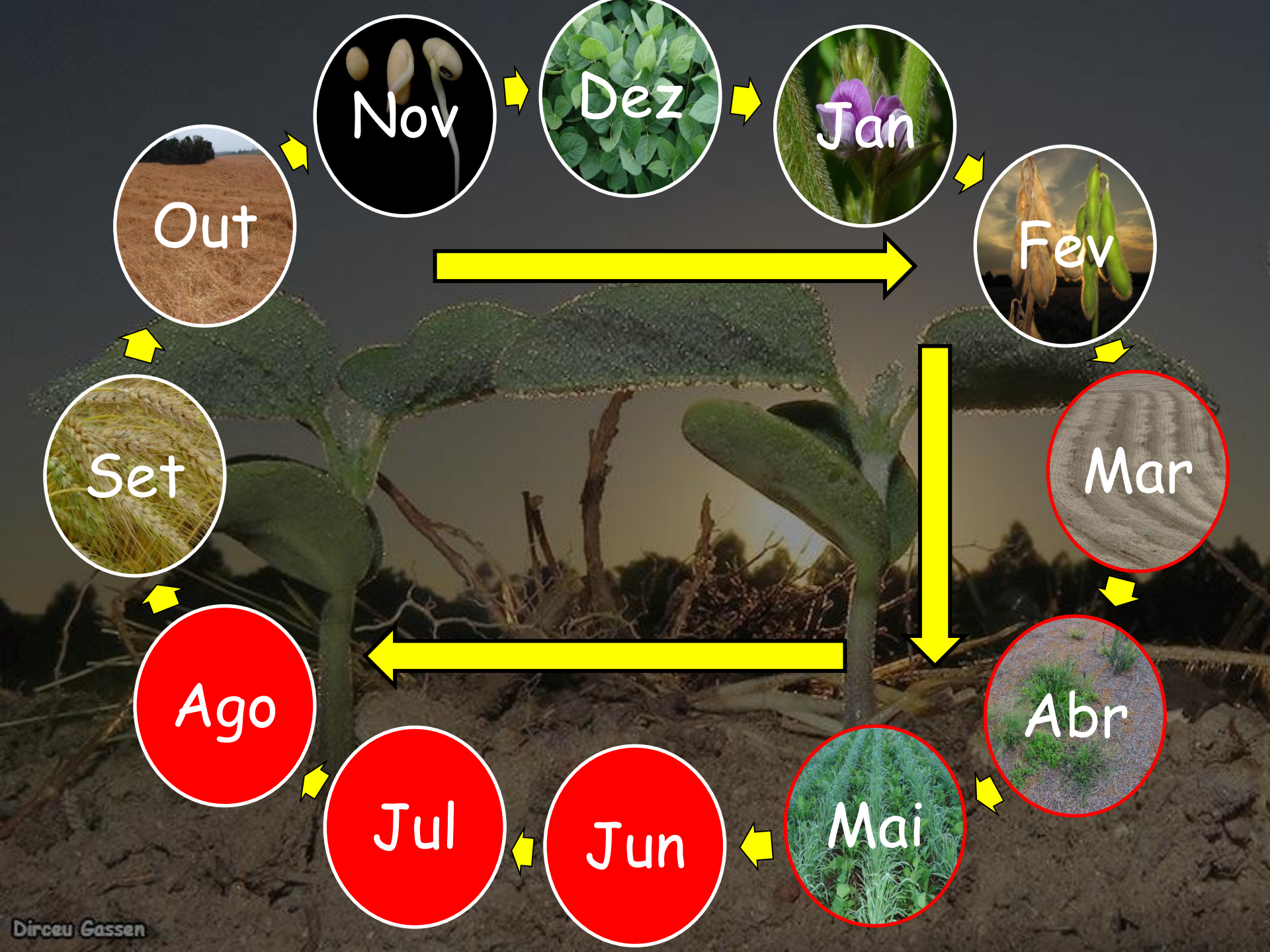
Nov
Dez
Jan
Fev
Mar
Abr
Mai
Jun
Jul
Ago
Set
Out
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Pousio é crime
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520 thousand seeds/plant

182 achenes/capitulum (head)

Taxa de resistência (TR) de populações do percevejo *Euschistus heros*, PR, SP e MS

Endossulfam *Monocrotofós* *Metamidofós*

Fonte: Insecticide Resistance to Endosulfan, Monocrotophos and Metamidophos in the Neotropical Brown Stink Bug, Euschistus heros (F.). DANIEL R. SOSA-GOMEZ1, IVAN C. CORSO1 AND LAURO MORALES. Embrapa Soja, Londrina. 2001

Safrinha: What to say?

Pest challenges

- Monocultures extensive
- Monogenetic (cultivars)
- Low agrochemical costs
- Pest resistance to chemicals
- New pests, knowledge, ethics, market rules...

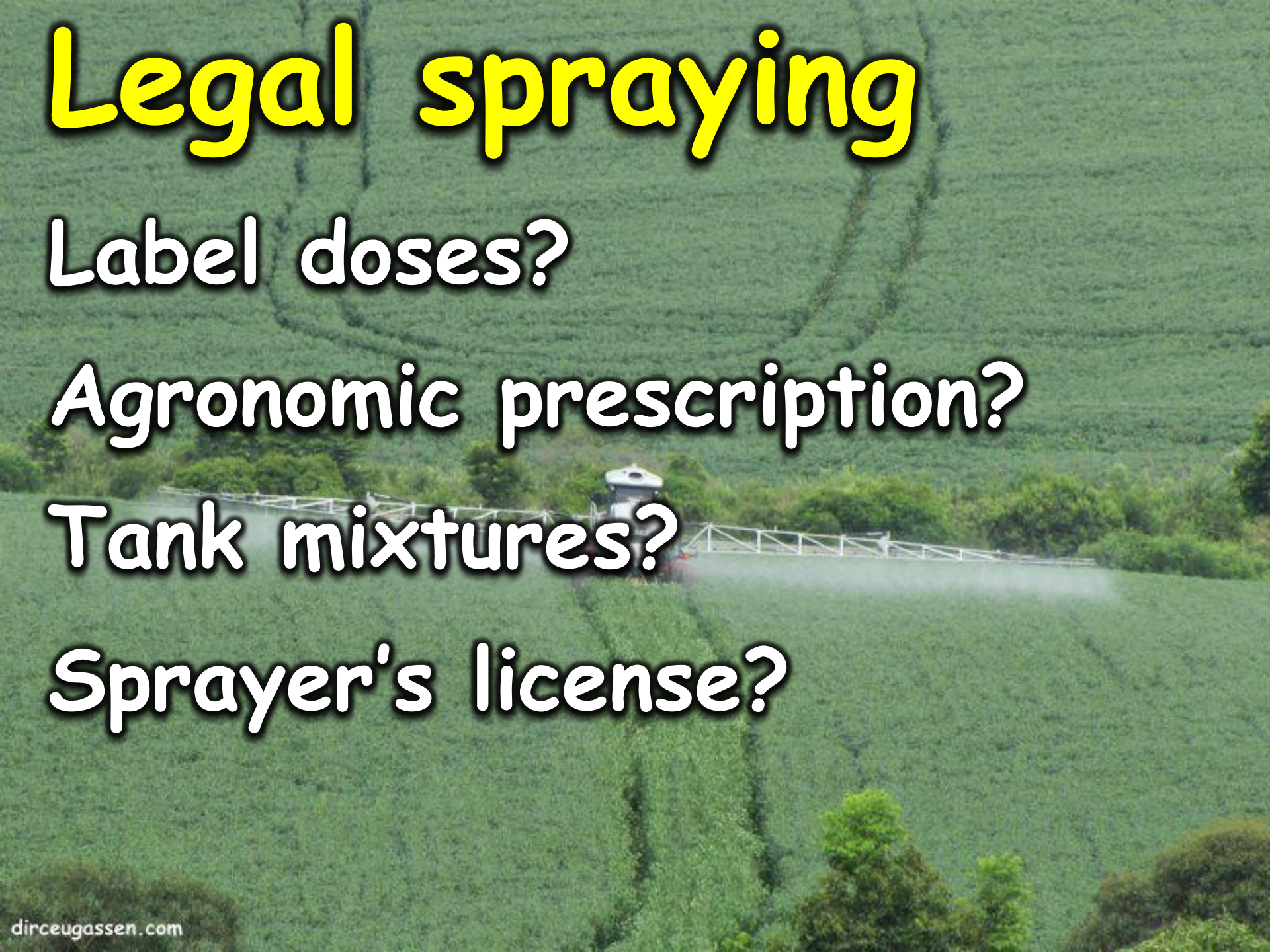
Legal spraying

Label doses?

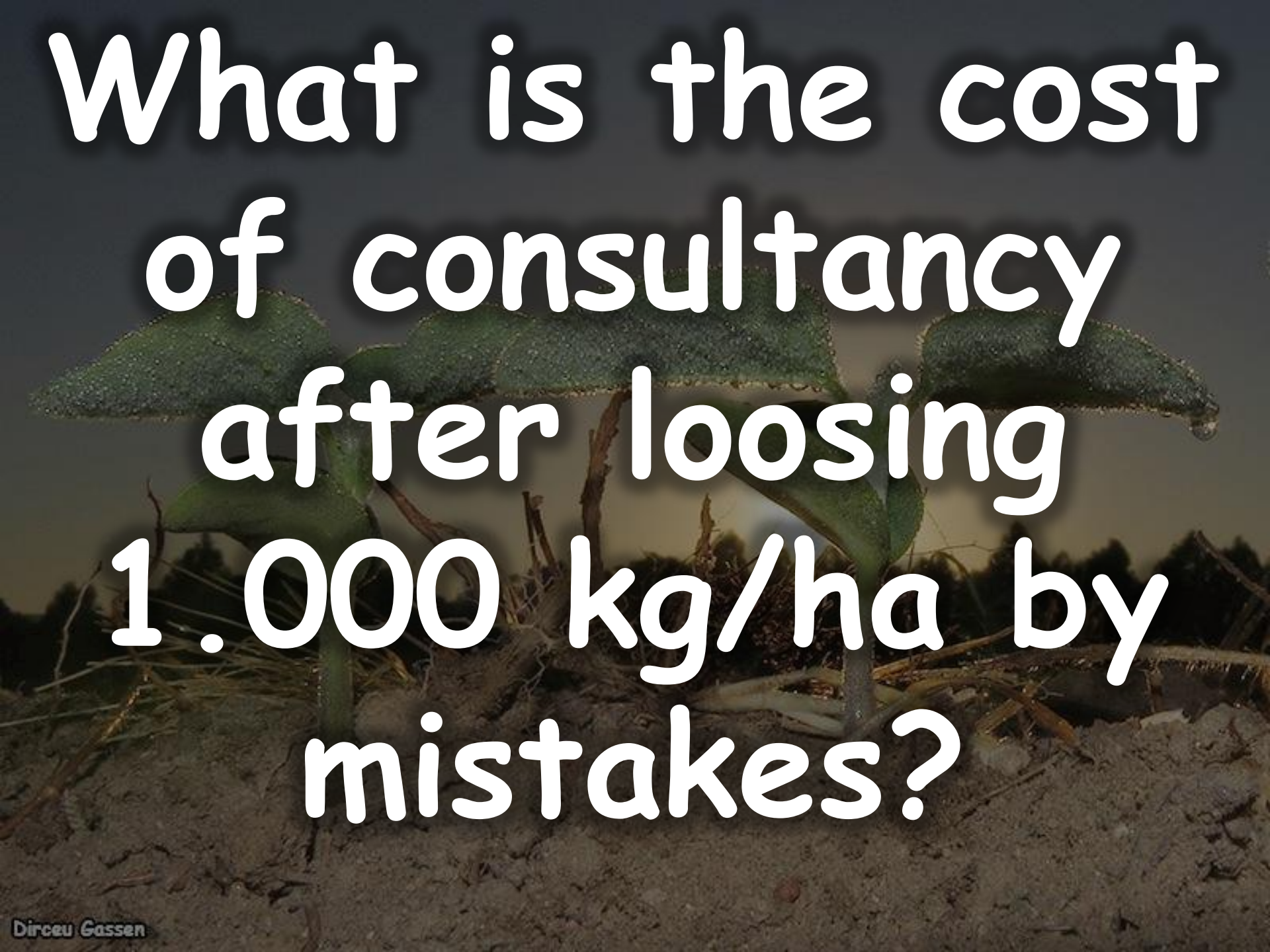
Agronomic prescription?

Tank mixtures?

Sprayer's license?



Conclusions


What is the cost of consultancy after loosing 1.000 kg/ha by mistakes?
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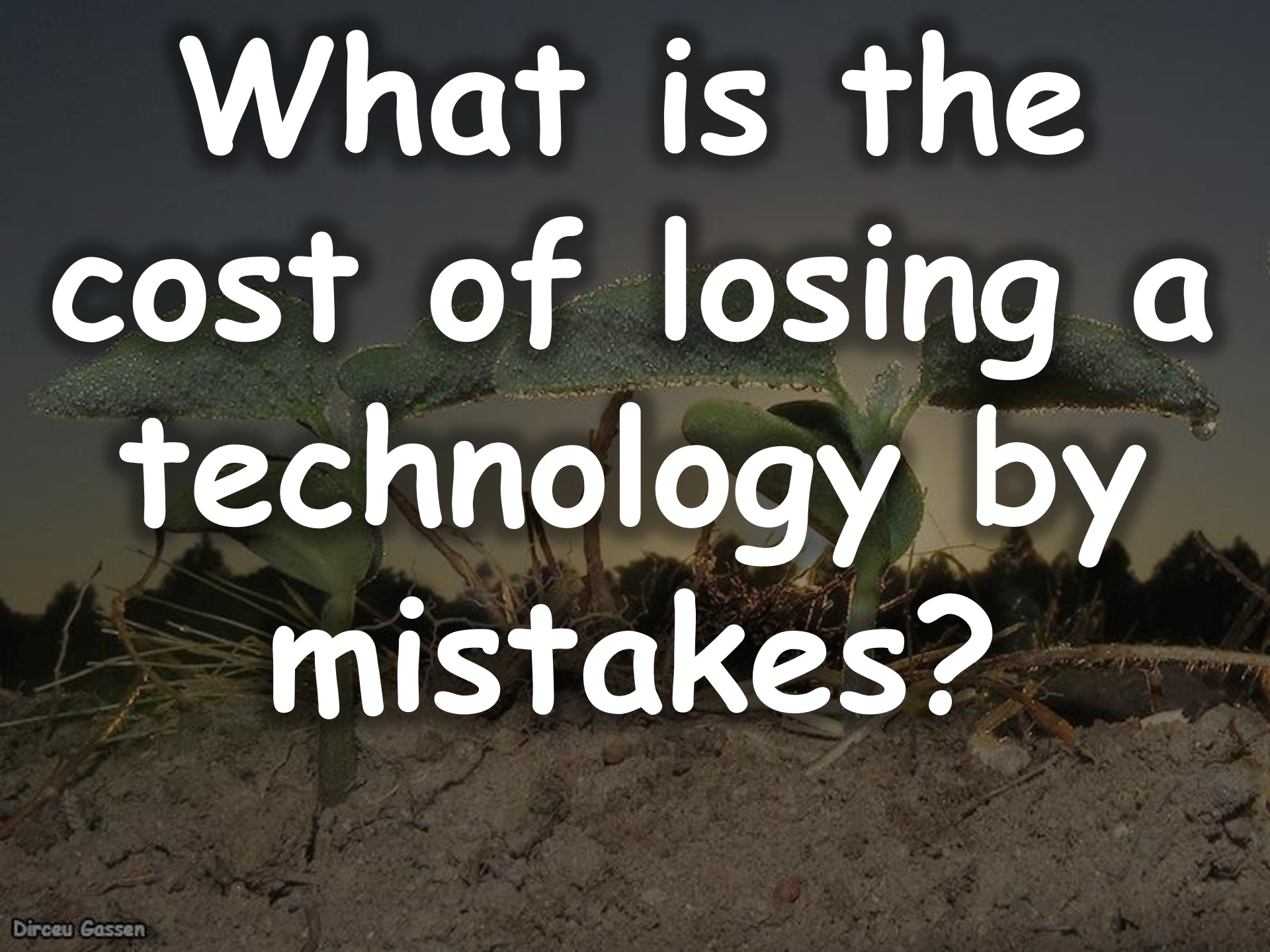
What is the cost of losing a technology by mistakes?
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Sustainable Agriculture

It is like sharing pigs: too much yelling for too little wool.

Brazilian popular saying


"If your only tool is a hammer then every problem looks like a nail"
"What can I spray?"
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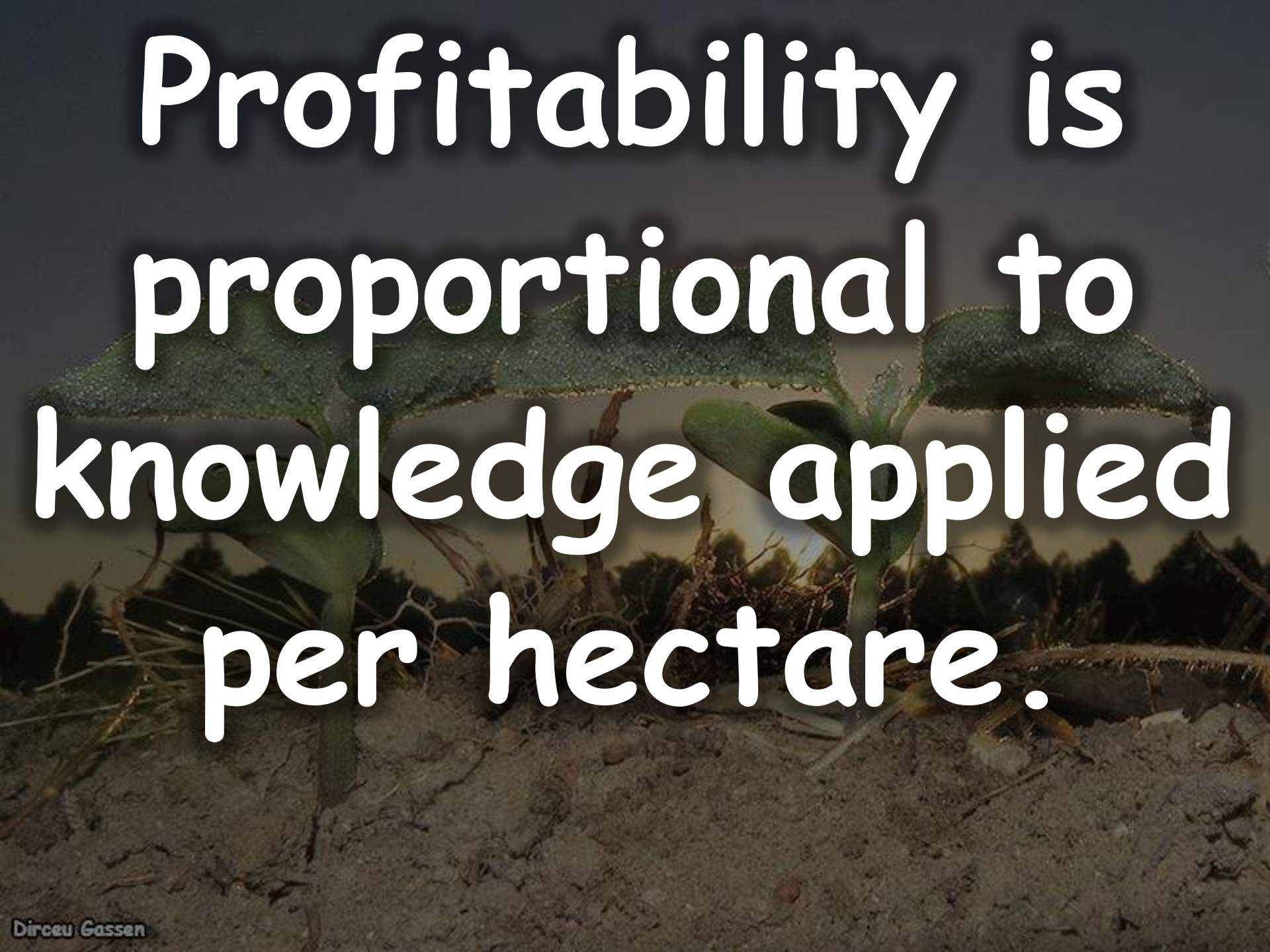
Profitability is proportional to knowledge applied per hectare.
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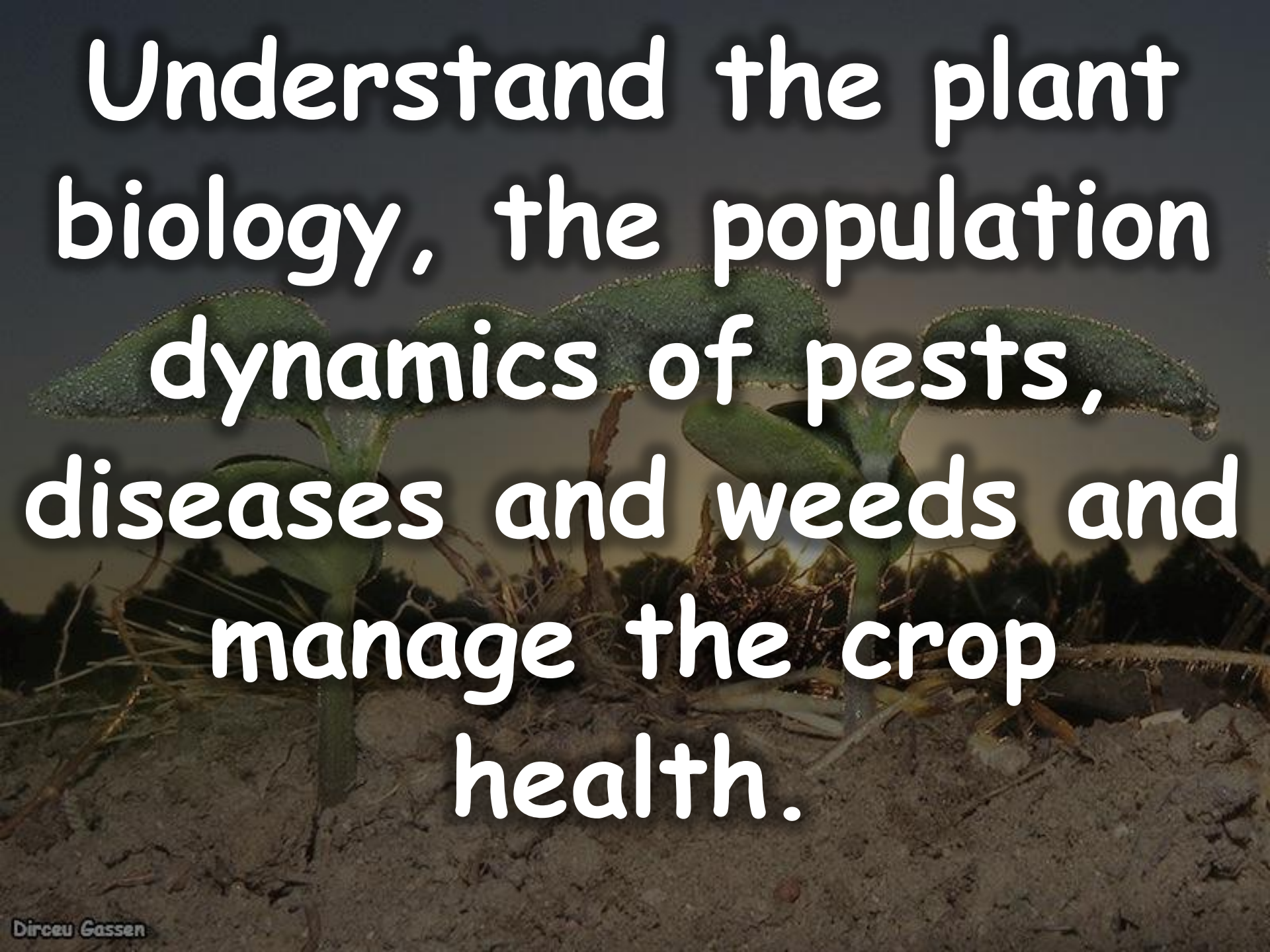
Understand the plant biology, the population dynamics of pests, diseases and weeds and manage the crop health.
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Ethical responsibilities to produce food

Obrigado!

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