Seed Treatments for Risk Mitigation

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Seed Tratments

Seed treatment is an **integral part** of crop protection and defined as the application of chemical ingredients and/or biological organisms to seeds intended **for agricultural use to control, suppress or repel** plant pathogens, insects, nematodes or other pests that can damage seeds, seedlings or the developing plants as well as improve soil health and utilization of crop inputs.

Other ingredients such as specific polymers or colorants may be added to further improve the quality of the treated seed.

Treated seed is intended for planting only and must not be allowed to enter food or feed supply channels or be used in oil processing.

Seed Tratments

- Seed treatments act as a mechanism to control and/or supression for insect, nematode and diseases management tools to improve production and yield opportunitites of crops

- Seed treatments are great tools for crop protection and phytosanitary meassures in order to minimize risks and spread of pests, while enhancing productivity

Seed treatments through the ages

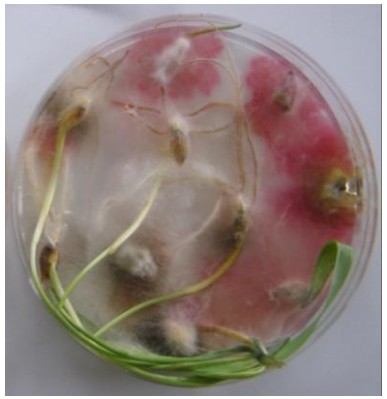
Seed treamtents have been used as far back as the Egipcians

It wasn't until around 1950 that the first systemic seed treatment was launched into the market

The 1990 brought a wide range of new technologies into the seed treatment market, with more modes of action and active ingredient groups

In the 21st Century, the spectrum of protection, abiotic stress, biologicals and plant performance enhancers has played a large role in pest control and early crop establishment

Evolution in disease control in Cereals seed applied technology – InVitro



UNTREATED

‘70s Technology

‘80s Technology

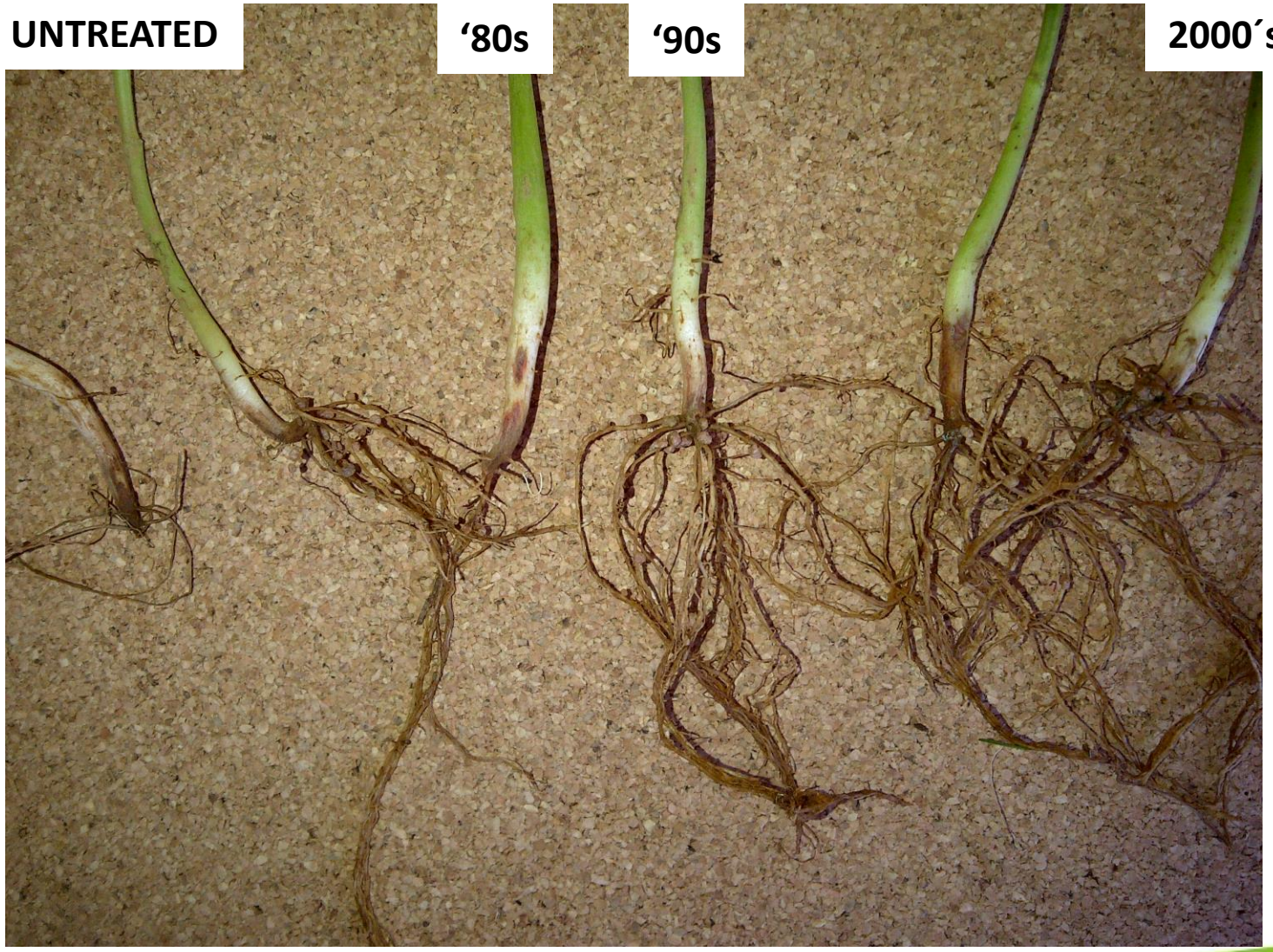
‘90s Technology

’00s Technology

’10s Technology

Photos source: Ted Labun, Syngenta Canada and 20/20 Seed Labs

Not all Seed Treatments are the same, the evolution is clear – 30 DAP



Photos source: Dr. Luis M. Serrano, Universidad de Chapingo

Seed Treatments - agenda

Why they are important

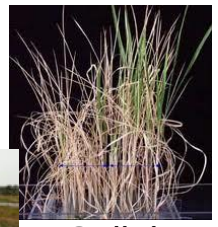
Seed treatments offer an effective way to stop diseases from spreading across fields and protect seedlings from early insect and nematode attacks.

- Seed Treatments' role in reducing pest spreading and enhancing crop establishment
- Seed Treatments as a Phytosanitary tool
- SAA Seed Treatment Working Group efforts

Reducing risk with broad spectrum protection

Abiotic stress

Dry conditions



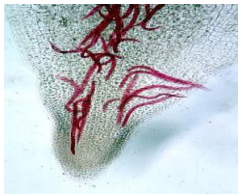
Salinity

Flooding

Early season foliar pests

Soil pests

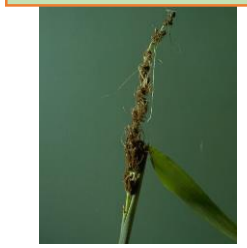
Nematodes



Foliar diseases

Seedling diseases

Seed and soil borne diseases



Prevention of diseases from spreading and ensuring early crop establishment – 30 days after planting

Untreated

Treated

Photos source: Dr. Luis M. Serrano, Universidad de Chapingo

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Seed treatments are a great tool to reduce risk of disease spreading through seed

SAA Seed Association of the Americas

Different modes of action offer a broader protection spectrum and reduce risk of resistance

- New seed applied technologies and active ingredients are being registered and added to existing ones, making a broader protection of high valued Seed
- A larger number of active ingredients mixed and applied to the seed, gives different modes of action to protect seed and seedlings from disease, insects, nematodes and other abiotic stresses during crop establishment
- Several modes of action are important in reducing the risk of pests developing resistance to these technologies

Different modes of action offer a broader protection spectrum and reduce risk of disease resistance

DISEASE ACTIVITY – SEED-BORNE PROTECTION

	Fusarium	*Diplodia (Stenocarpella)*	*Sporisorium (Sphacelotheca)*	*Mucor*	*Rhizopus*	*Aspergillus*	*Cladosporium*	*Helminthosporium*	*Penicillium*
Fenil-pirrole	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fenilamide									
Strobilurin		✓	✓				✓	✓	✓
Triazole	✓	✓	✓	✓	✓	✓	✓	✓	✓

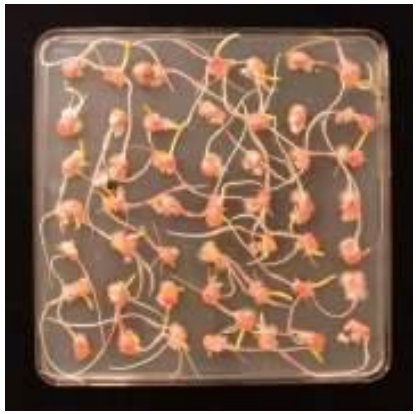
Systemic and contact modes of action used in combination to control Fusarium graminearum

The importance of combining modes of action to clean seed, inside and out:

- Allows for a far better control of seed borne diseases and prevent spreading to other fields
- In this case, we can see the effect of two modes of action in controlling Fusarium sp. infected seed
- An important tool to prevent resistance development by diseases and pests

Control of Seed-borne Fusarium graminearum with different modes of action

Untreated



Fenil-perrole (contact)

Triazole (systemic)

Combined

Source : Syngenta Seedcare

Seedling loss = poor crop establishment

Abiotic stress

- Bio-stimulants
- Biological products
- Micronutrients
- Water and nutrient use efficiency
- Root stimulants

Early season foliar insects

- Diamides
- Sulfoximines
- Neonicotinoides
- Carbamates

Soil insects

- Diamides
- Neonicotinoides
- Biologicals
- Pyrethroids
- Carbamates

Nematodes

- Biological products
- Chemical solutions

Diseases

- Long lasting protection
- Downy mildew
- New modes of action – SDHIs
- Sudden death syndrome
- Biological products

Seed treatment as phytosanitary measures

- Seed treatments are used as production practices & as phytosanitary measures that NPPO may require, to minimize pest risk.

- Seeds may be treated to eliminate an infestation by a pest also as general disinfection or to protect the seedlings growing from the seeds when exposed to pests in the environment.

- Seed treatments may include pesticides, disinfectants- physical or biological treatments.

- As phytosanitary measures may be required alone or in combination with other measures: for example in a system approach.

- As equivalent phytosanitary measures may provide NPPOs with options to achieve the required protection (example substitution of a requirement for field inspection, seed testing)

Seed treatment as a component of best practices & stewardship:

- Companies usually implement best practices in stewardship

- Adoption of product **stewardship programs and quality management systems** for the full life cycle of agricultural products, **enhances** the quality & health of the seeds produced

- Use of seed treatments as a measure to mitigate seed phytosanitary risks, are an important element of these programs

Seed Treatments -agenda

Why they are important

The most effective way to stop pests from spreading across fields, counties, states, countries, regions and continents around the world.

- Seed Treatments' role in reducing pest spreading and enhansing crop establishment
- Seed Treatments as a Phytosanitary tool
- SAA Seed Treatment Working Group efforts

SAA Seed treatment WG : a proactive approach within the industry

- Engagement and work closer with regulatory bodies, through National Seed Associations' seed Treatment working groups
- Seeking a clear understanding on both parties, on topics like quarantined pests on imported seed and how new seed treatments can be a great tool to mitigate risk of these pests from spreading into the importing country
- Product data base for all Seed Applied Technologies (Fungicides, Insecticides, Nematicides, Micronutirents, Biologicals, Polymers, Colorants, Flowability agents, Growth regulators, etc)
- Promoting use and safe use of seed treatments across the Americas

Thank you for your attention!

SAA Seed Association of the Americas