



Understanding the Value of Soybean Seed Treatment

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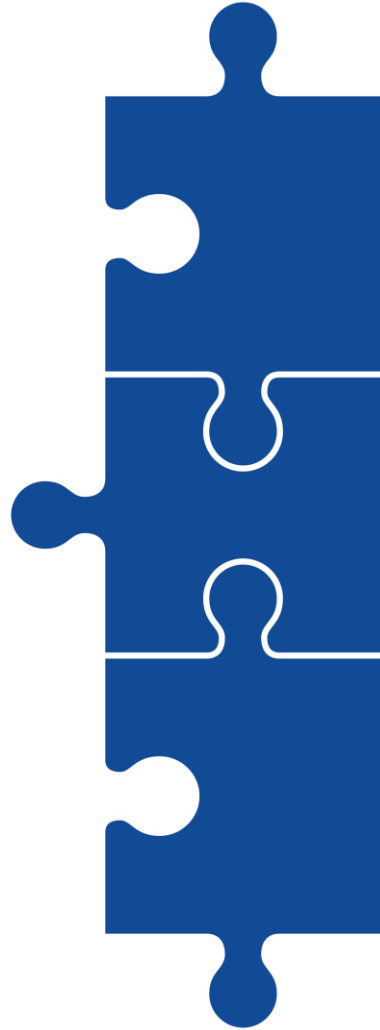
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Seed Technology - Interlocking Pieces

Seed Treatment Technology



Seed

- Quality Seed
- Seed Traits

Seed Treatments

- Chemicals
- Biologicals

Application

- Seed Coatings
- Application Equipment

What is Seed Treatment?

Seed treatment application, as defined, relates to the placement on or around the seed of those products (i.e., fungicides, insecticides, nematicides, minor elements, herbicide safeners, dyes, plant growth regulators, etc...) which are considered beneficial or necessary in maintaining or enhancing genetic yield potential of a crop.

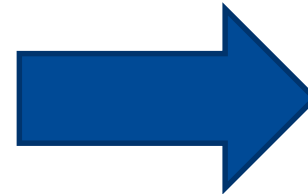
- Protection from pathogens or pests that may damage the seed in storage, during the initial planting of the seed or during the early growth of the seedling.
- Beyond crop protection, seed treatment chemicals also have been shown to increase germination rates, vigor and root development.

Why use seed treatments?



■ Seed Treatment Product Expectations

- Maintain quality of seed
- Coverage on seed
- Flowability and ease of planting
- Safe to applicators
- Appropriate for environment



■ Seed Treatment Targeted Outcomes

- ▶ Better emergence
- ▶ Higher seedling establishment
- ▶ Improved crop health
- ▶ Higher yields
- ▶ Improved crop quality
- ▶ Reduced application energy, time and costs

Types of Soybean Seed Treatments

Need new photo



Fungicides

- Protect against seed and seedling diseases, such as Pythium, Phytophthora, Sudden Death Syndrome

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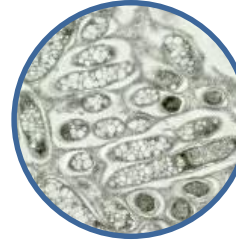
Insecticides

- Protect against above- or below-ground insects such as seed corn maggot, aphids, bean leaf beetle,



Nematicides

- Protect against damage from plant-parasitic nematodes such as Soybean Cyst Nematode



Biologicals

- Non-chemical treatments, such as bacteria
- Plant growth promotion and/or protection against pests



Inoculants

- Improve nitrogen fixation in legumes



Coatings

- Enable seed flow and active ingredient retention

How does a seed treatment investment reduce financial risk?

■ Efficacy – Increased yield potential

- ▶ Early insect pest protection
- ▶ Fungal disease reduction – this year's disease pressure is unknown at planting
- ▶ Nematode protection
- ▶ Plant vigor – often seeds treated with seed treatments demonstrate a more vigorous and earlier emergence, getting the crop off to an earlier more robust start

■ Mitigate Risk from Various Pests

- ▶ Different diseases thrive under different soil temperatures and moisture levels. Seed treatments can provide broad spectrum protection regardless of the early season conditions
- ▶ Reduced tillage practices and use of cover crops can create a green bridge keeping pests alive to attack the young seedlings

■ Alleviate Risk of Replant and Reduce Overseeding

- ▶ Saves time that would otherwise be needed for replant
- ▶ Increase yield potential (later planting dates lead to less solar energy capture)

How are soybeans treated?



Batch Treater

Upstream Treating

- Seed manufacturer processes and bags seed



Downstream Treating

- Seed is treated at regional facilities or retail locations



Continuous Flow Treater

Regulatory requirements for seed treatment registrations

Safety

- Before any pesticide is registered, it undergoes extensive testing. Registration is only granted if the products do not pose any unacceptable risks to the health and the environment

Efficacy

- Efficacy data is not a requirement for EPA registration. Some states require efficacy data for state registration.

What questions should you ask to make a seed treatment decision?

■ What are the top issues you are facing?

- ▶ Disease, insect, nematode pressure

■ What questions should you ask about your product options?

- ▶ What are the active ingredients and how much of each one is in the product?
- ▶ How much data is available on the product? Are the results realistic?
- ▶ How long has the product been tested? Are the data sources credible?
- ▶ Do you have any personal experience with the product?

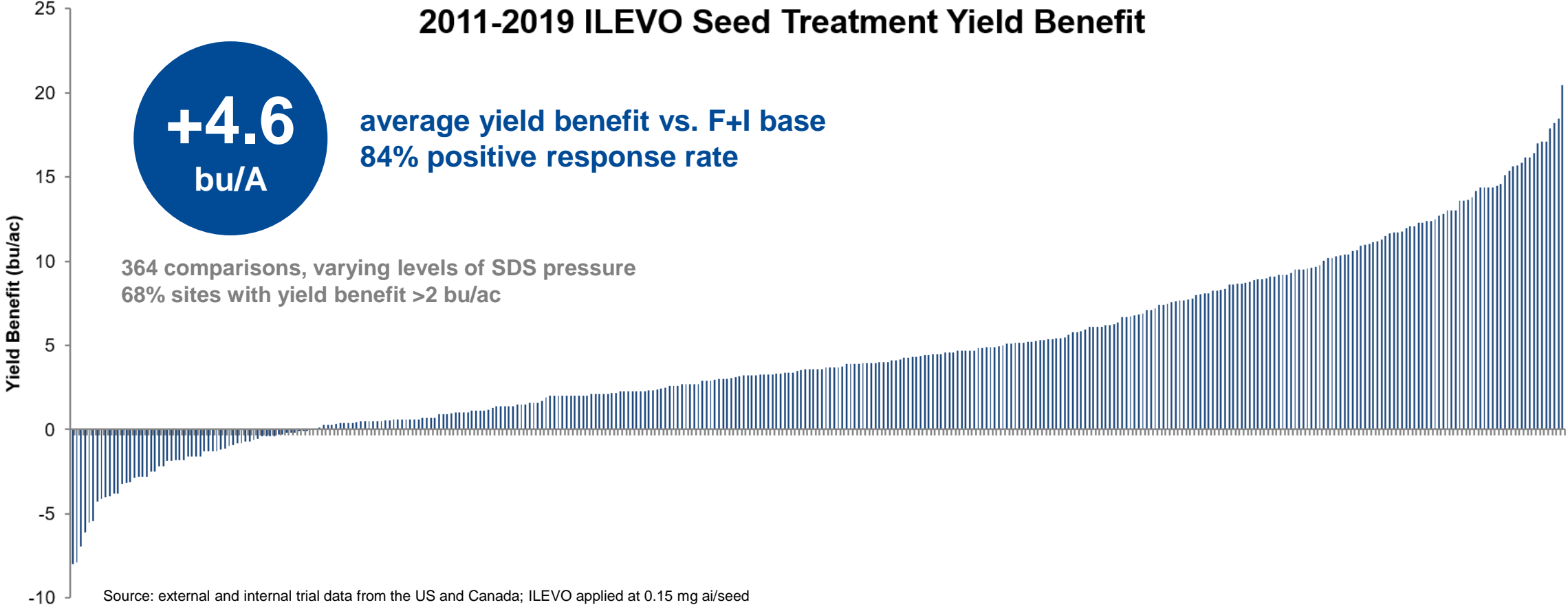
ILEVO Seed Treatment Yield Benefit

2011-2019 ILEVO Seed Treatment Yield Benefit

+4.6
bu/A

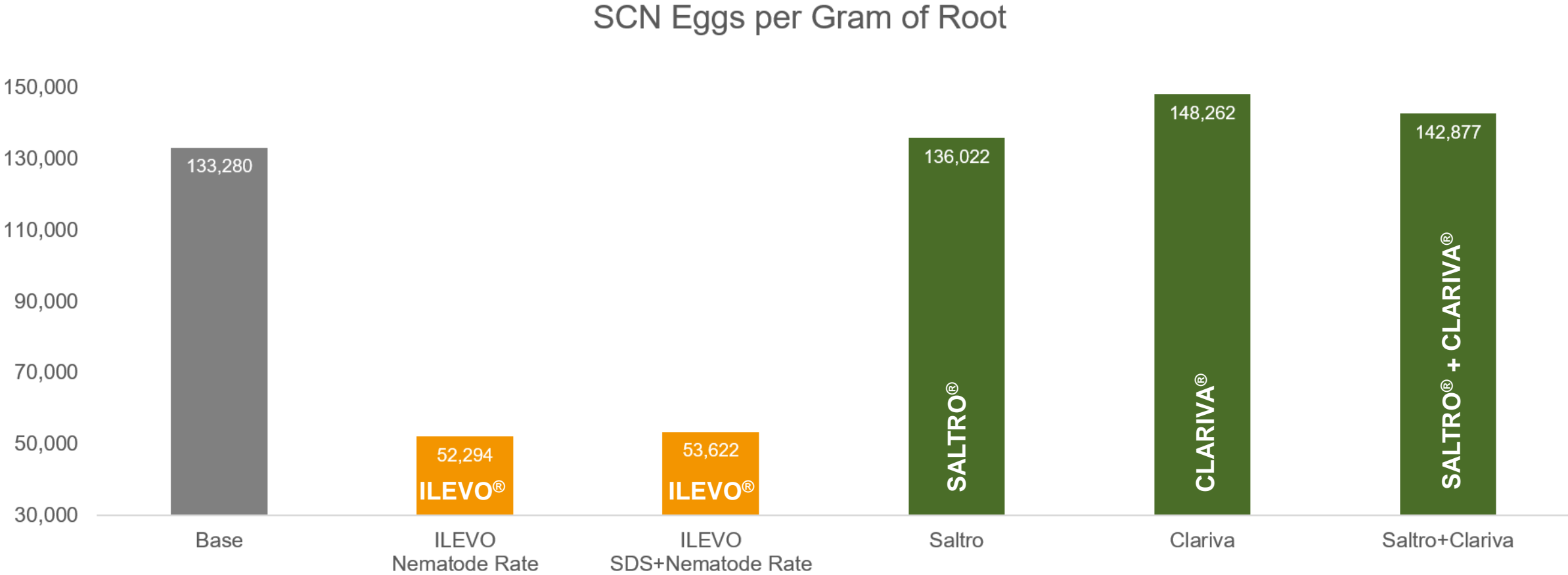
average yield benefit vs. F+I base
84% positive response rate

364 comparisons, varying levels of SDS pressure
68% sites with yield benefit >2 bu/ac



Source: external and internal trial data from the US and Canada; ILEVO applied at 0.15 mg ai/seed

Comparison of Product Performance Against Nematodes



BASF RTP Seed Treatment Technology Center. Plants harvested at 30 days after inoculation using SCN root extraction method, 2019.



Comparison of Active Ingredients Across Products

Obvius® Plus

Fungicide Seed Treatment



CruiserMaxx® Vibrance®

Warden® CX

Use rate: 1.53 fl oz/CWT

Use rate: 2.0 fl oz/CWT

Use rate: 3.22 fl oz/CWT

Use rate: 3.38 fl oz/CWT

Active Ingredient	g A.I / 100kg
Pyraclostrobin	4.0
Fluxapyroxad	5.0
Metalaxyl	16.5
Thiophanate-methyl	10.0

Active Ingredient	g A.I / 100kg
Pyraclostrobin	5.0
Fluxapyroxad	5.0
Metalaxyl	8.0

Active Ingredient	g A.I / 100kg
Fludioxinil	2.5
Sedaxane	2.5
Mefenoxam	7.5
Thiamethoxam	50.0

Active Ingredient	g A.I / 100kg
Fludioxinil	2.5
Sedaxane	2.5
Mefenoxam	15.0
Thiamethoxam	50.0



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