

Seed Treatment Application Quality

Determinants and their Impact

The Syngenta logo is displayed in white text on a dark green background. A large, stylized, light gray graphic of a seedling root and leaf is positioned on the right side of the slide, partially overlapping the Syngenta logo and the title area.

syngenta

Dr. Franz Brandl

Global Head Seedcare Institute

THE
SEEDCARE
INSTITUTE

Agenda

- Seed treatment targets and benefits
- Determinants of application quality
 - Seed production and processing
 - Seed Treatment Process
- Application and treated seed quality parameters
- Summary

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Targets of seed treatment

Abiotic Stress



drought



salinity



flooding

Early leaf feeding and sucking insects



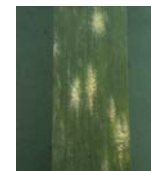
Soil insects



Nematodes



Air borne diseases



Seedling diseases



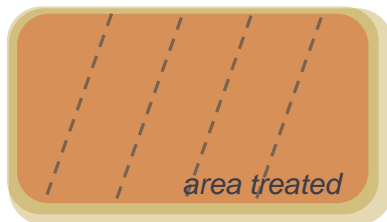
Seed and soil borne diseases



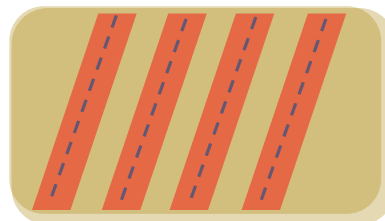
Advantages of seed treatment technology

- ❑ **“In-the-bag” -delivered protection**
 - Protection of seed investment
 - Grower convenience
- ❑ **More efficient farming operation**
 - Labor saving from the start
 - Reducing CO2 footprint
- ❑ **Targeted application**
 - Efficacy and safety at low use rates
 - Limited environmental exposure
- ❑ **Yield improvement**
 - one seed one plant
 - only option to control specific diseases and pests

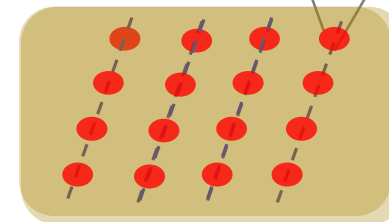
Sprays



In-furrow



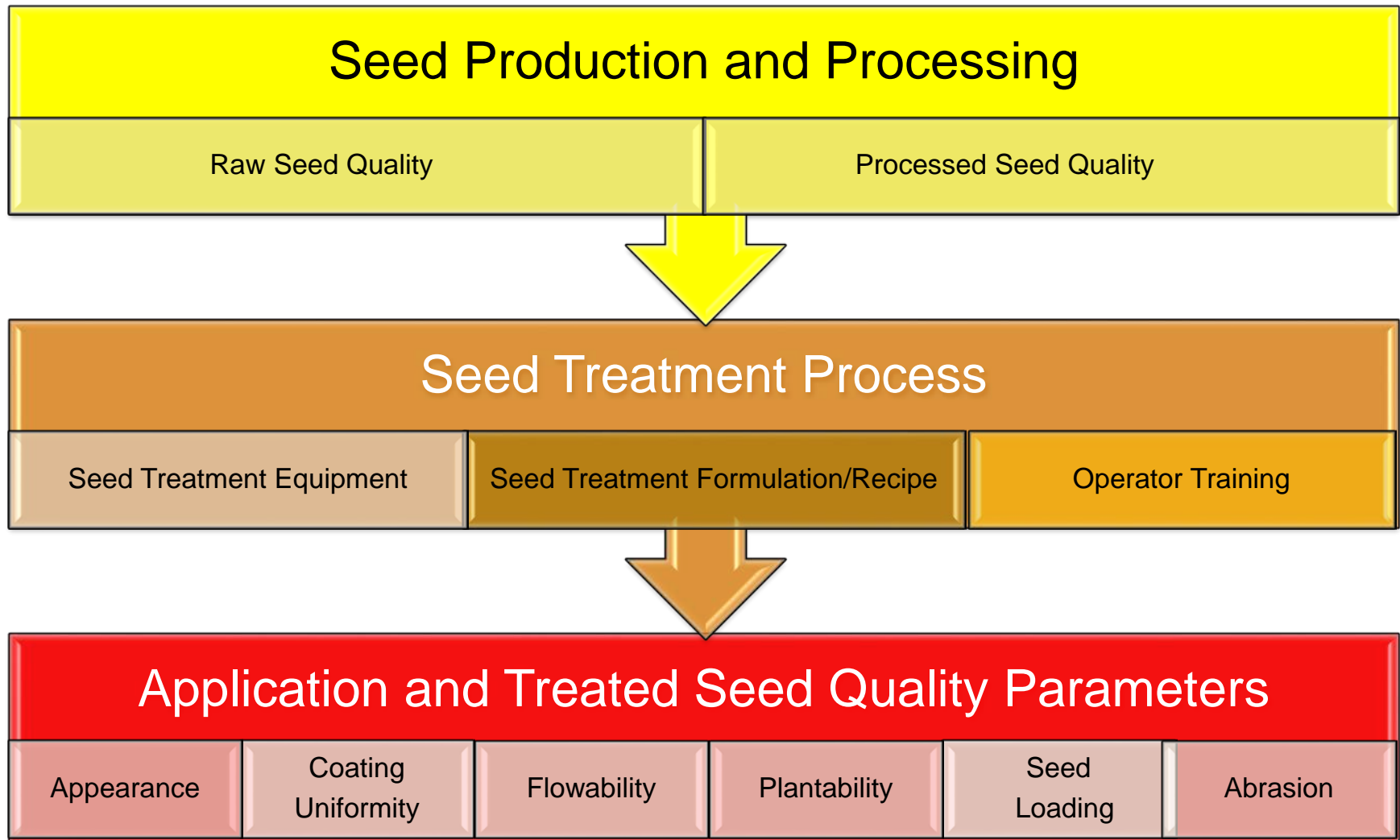
Seed-treatment



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Determinants of application quality



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Seed production and processing

Raw Seed Quality

- Disease and pest management
- Weed control
- Fertilization
- Weather conditions
- Seed moisture at harvest
- Setting of combine harvester

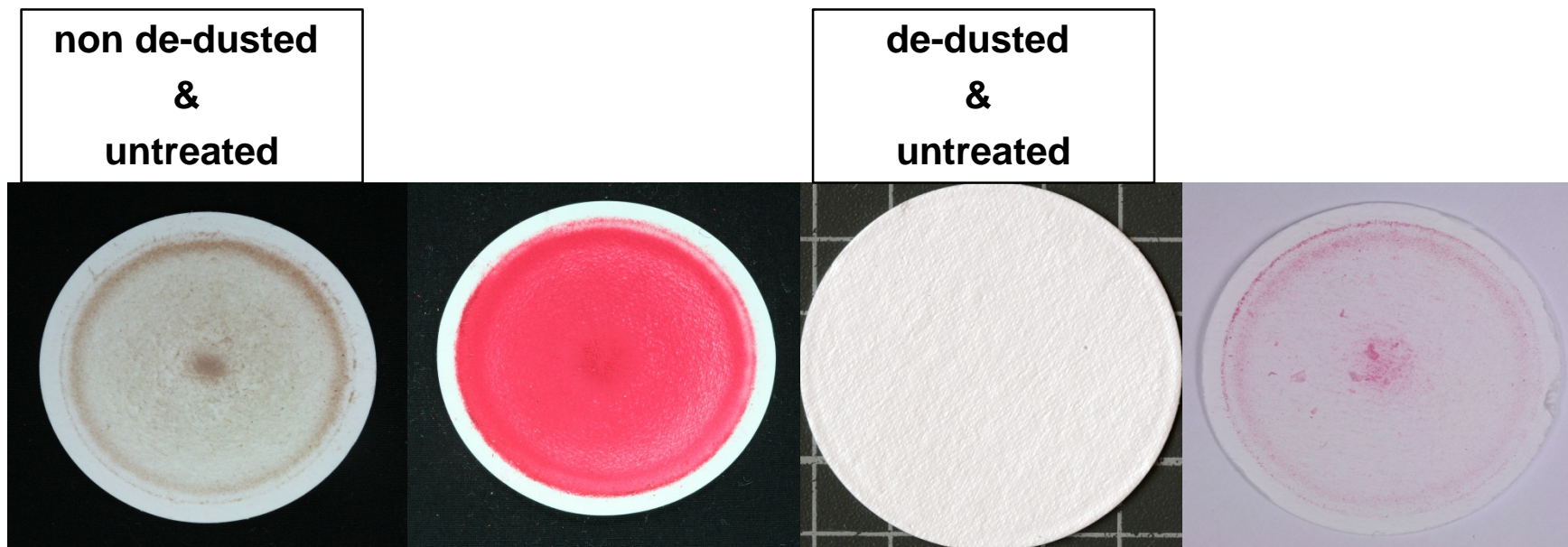
Processed Seed Quality

- Drying
- Cleaning/de-dusting
- Sorting (purity)
- Sizing
- Pelleting



Effects of seed cleaning on application quality (1)

Dust-off and loading



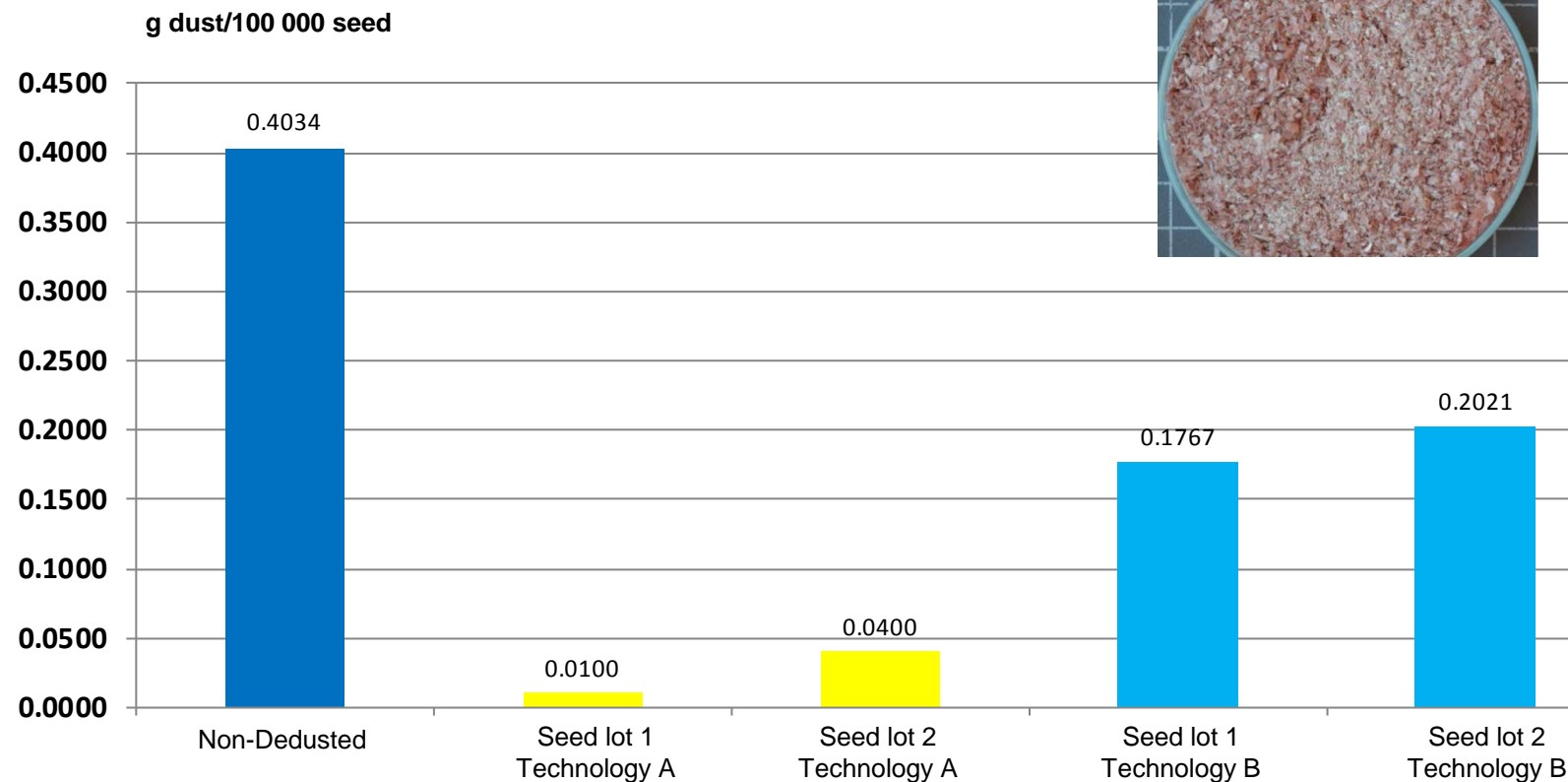
Reduced dust-off

...improved seed loading due to less dust off*)

*) effect is a combination of low-dust seed and sticker (polymer) quality

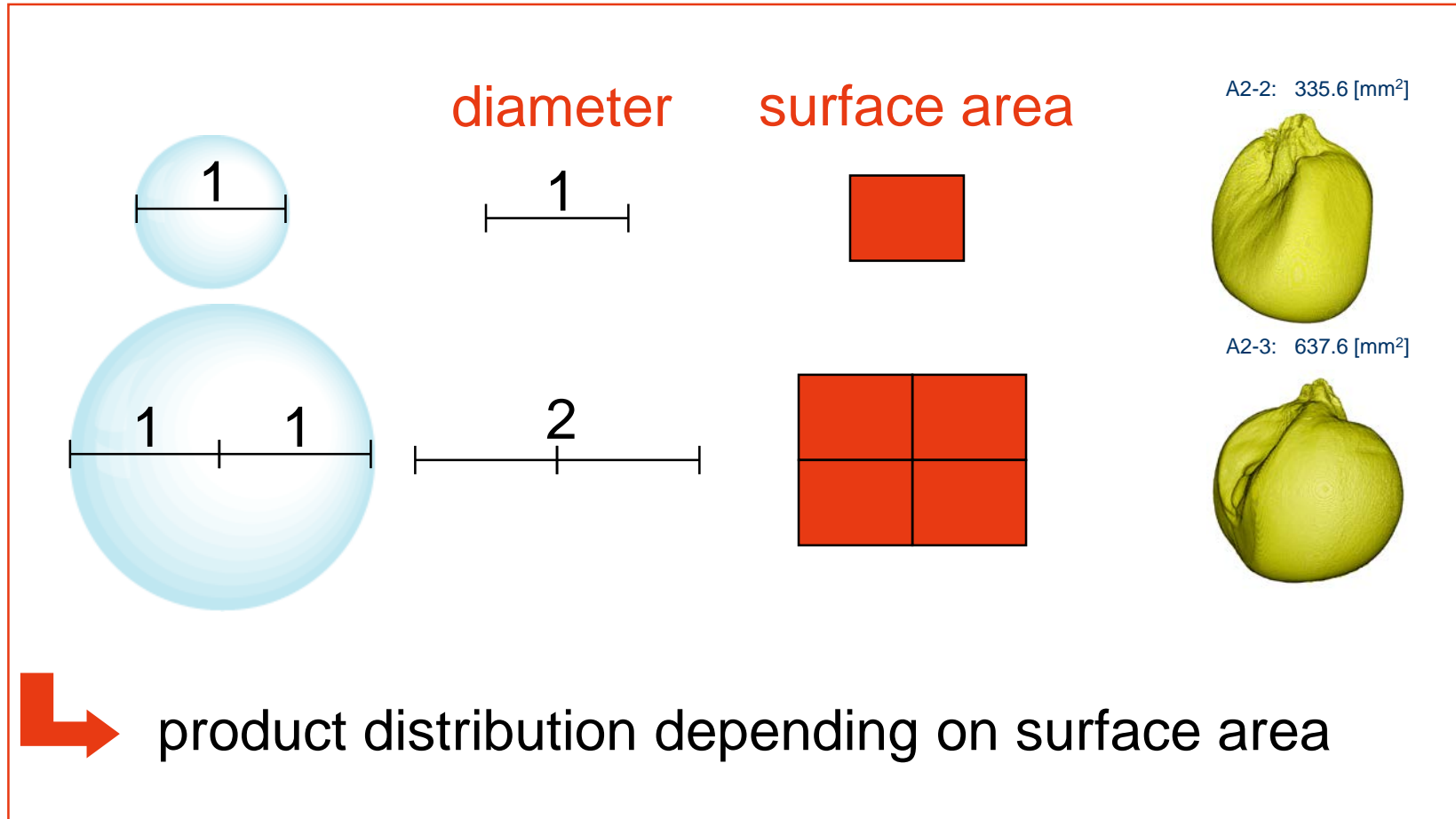
Effects of seed cleaning on application quality (2)

Dust-off and loading



Effects of seed sizing on application quality (1)

Individual seed factor



Effects of seed sizing on application quality (2)

Seed lot factor

A2-1

A2-2

A2-3

A2-4

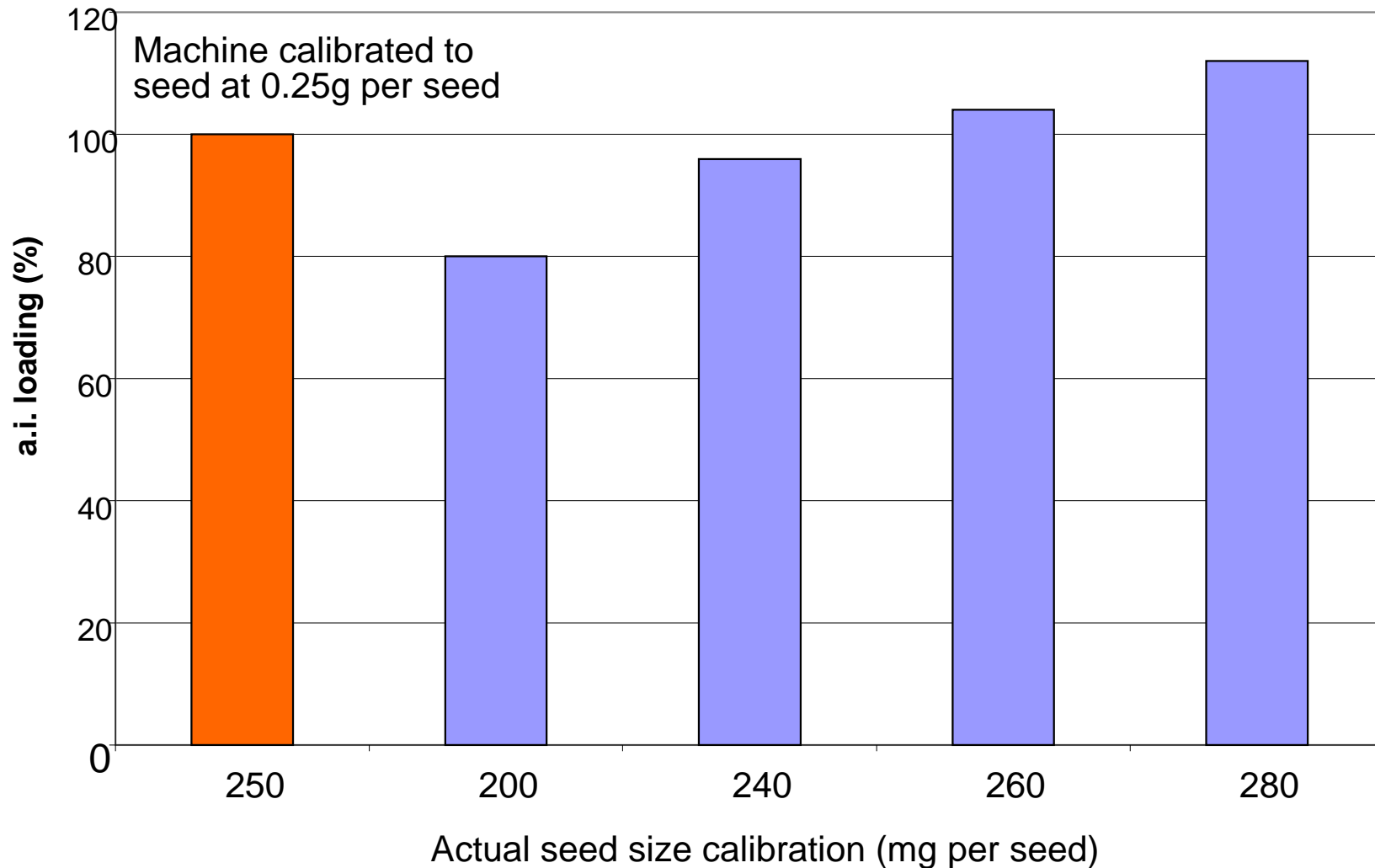
A2-5



Same Lot	weight [gr]	surface [mm ²]	volume [mm ³]
Seed (A2-1)	0.30923	460.4	223.9
Seed (A2-2)	0.30945	335.6	225.7
Seed (A2-3)	0.30900	637.6	236.3
Seed (A2-4)	0.30878	664.7	236.5
Seed (A2-5)	0.30926	550.0	230.1

Effects of seed sizing on application quality (3)

Seed lot factor



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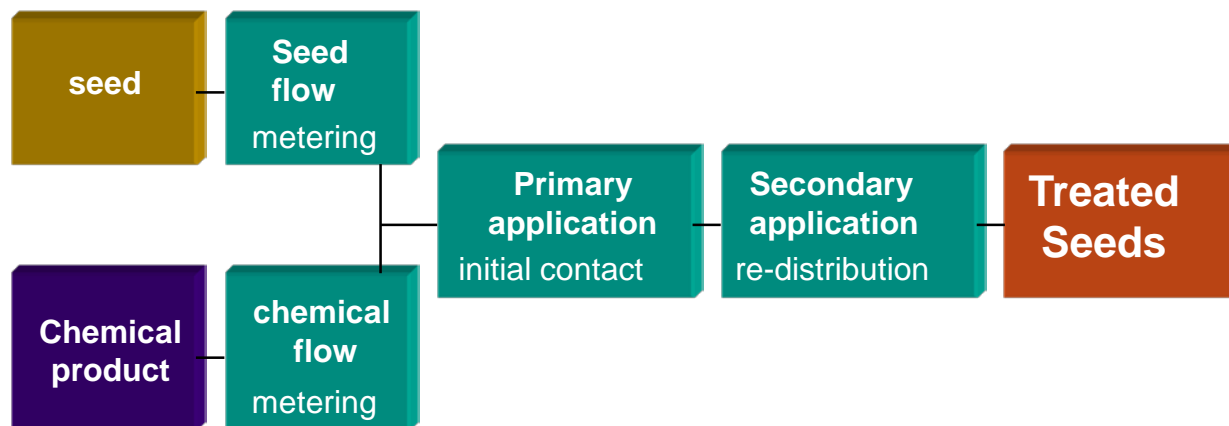
Seed treatment process

Application

- Slurry preparation
- Calibration
- Monitoring

Engineering

- Equipment configuration
- Equipment placement



Influence of recipe on application quality (1)

Recipe Components

Recipe Components	Influence on application quality
Formulation of active ingredients	Higher rates & increased # of AIs increasing load – biologicals & nutrients adding complexity
Seed coating additives (polymer formulations)	Can be large part of recipe weight, holds AI to seed, higher AI load makes polymer choice critical
Colorants	Differentiates companies and seed, improves appearance
Flowability agent	Right choice critical in high loading situations to avoid seed stickiness and increase throughput
Plantability agent	Right choice critical to avoid skips and twins on seeding plats to ensure planting accuracy
Water	Correct slurry volume critical for coating homogeneity
Finishing powder	Used to speed up drying of seeds and helps to avoid bridging



Recipes must be tailored to highly variable treater and seed types, environmental conditions and customer/operator preferences

Effects of seed type on application quality

Corn

40 - 60 m² / 100 kg



Wheat

80 m² / 100 kg

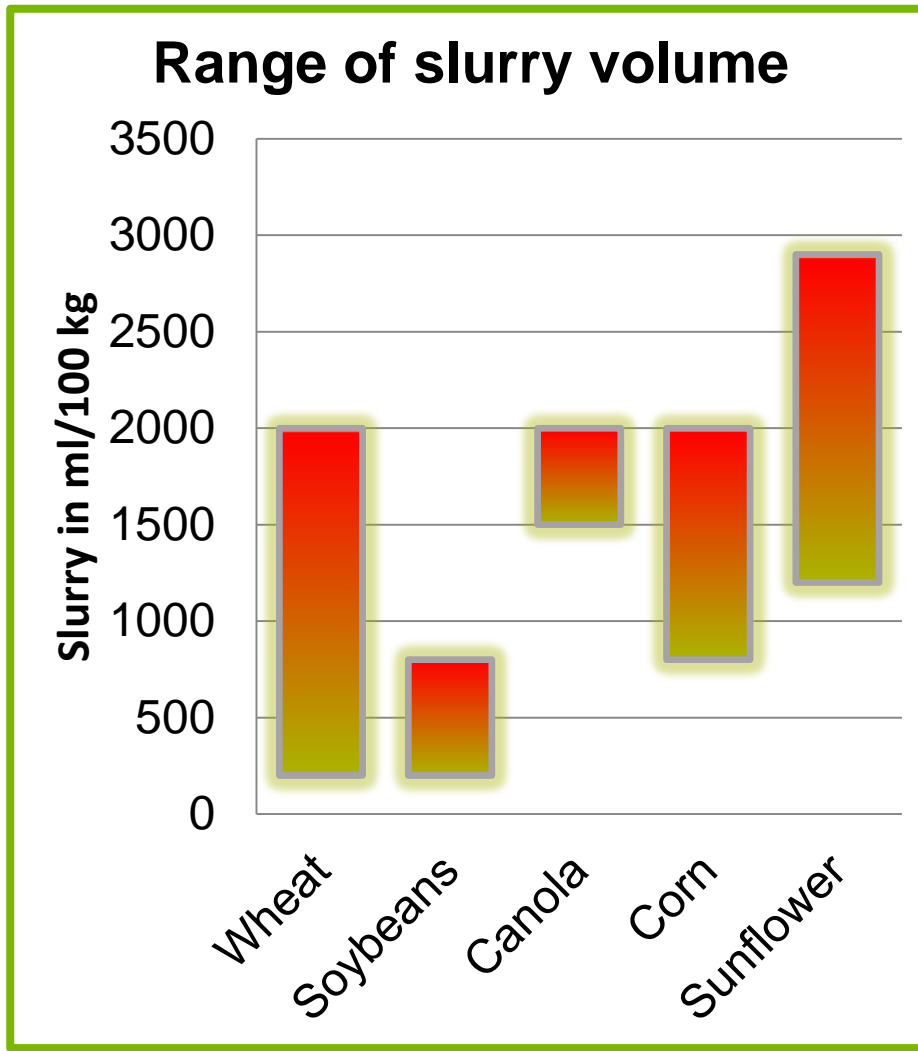


Oilseed rape

300 -350 m² / 100 kg

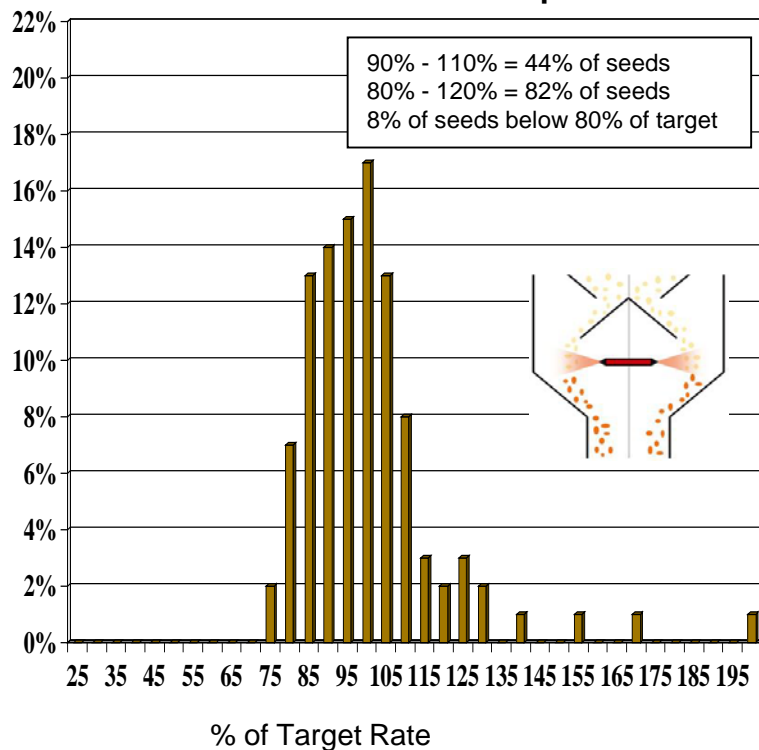


Influence of slurry volumes on application quality



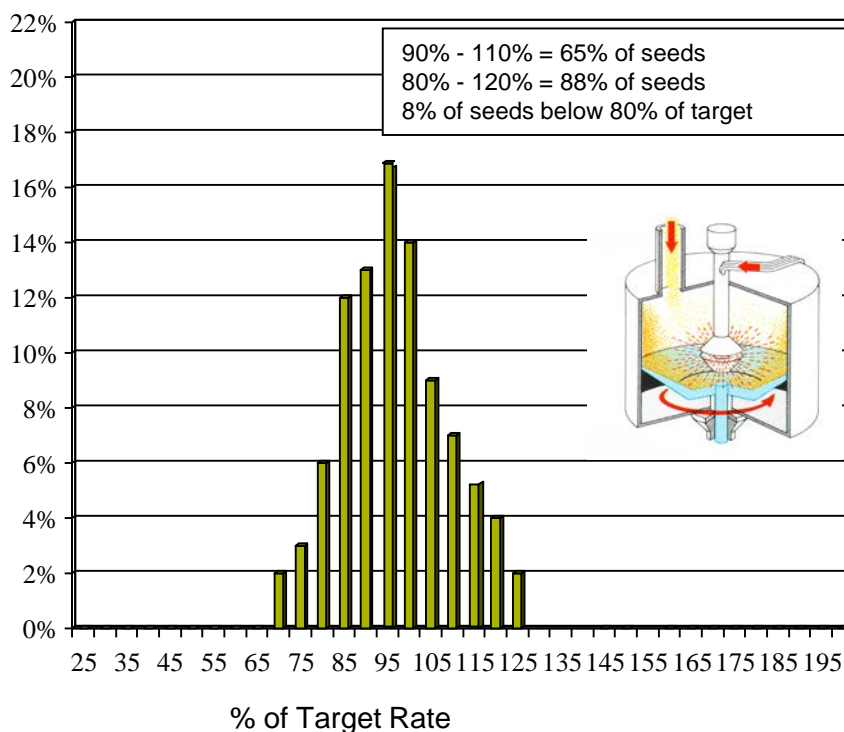
Influence of equipment on application quality

Continuous Flow Principle



- Fine mist application
- Treat most of the seeds at initial contact
- Easier re-distribution
- Lower volumes may be applied
- More gentle secondary treatment possible

Batch Principle



- Trend in technology
- Precise treatment possible
- Complex treatments possible
- Initial set-up time consuming
- Programmable
- Investment high

Training to ensure application quality

Different modules adapted to customer needs

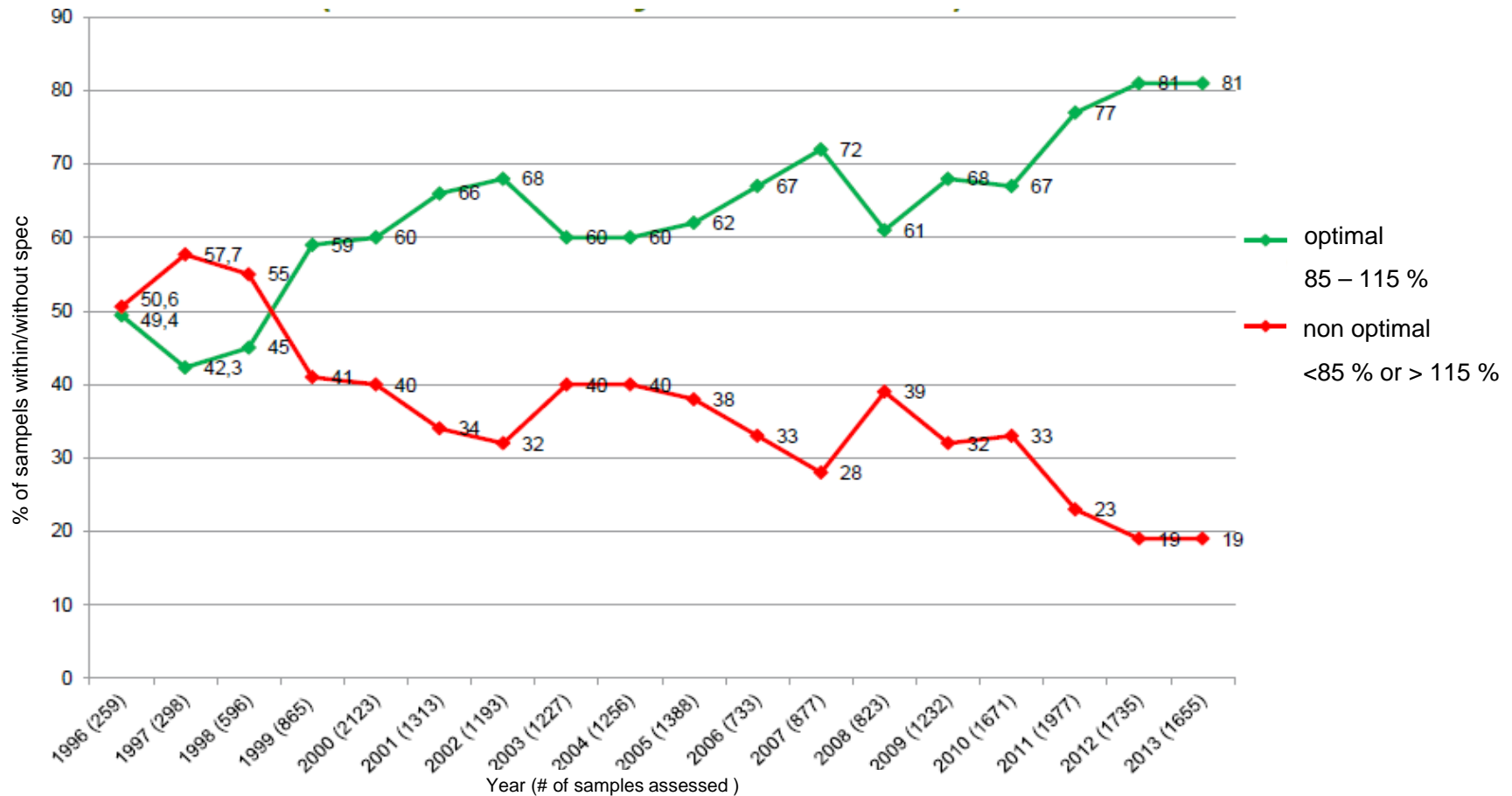
Modules

- Equipment technologies & features
- Setting of application parameters
- Calibration procedures
- Seed characteristics for application
- Recipe design and slurry preparation
- Quality assessment and measurement



Impact of training to ensure application quality

Results of a multi-year quality improvement program



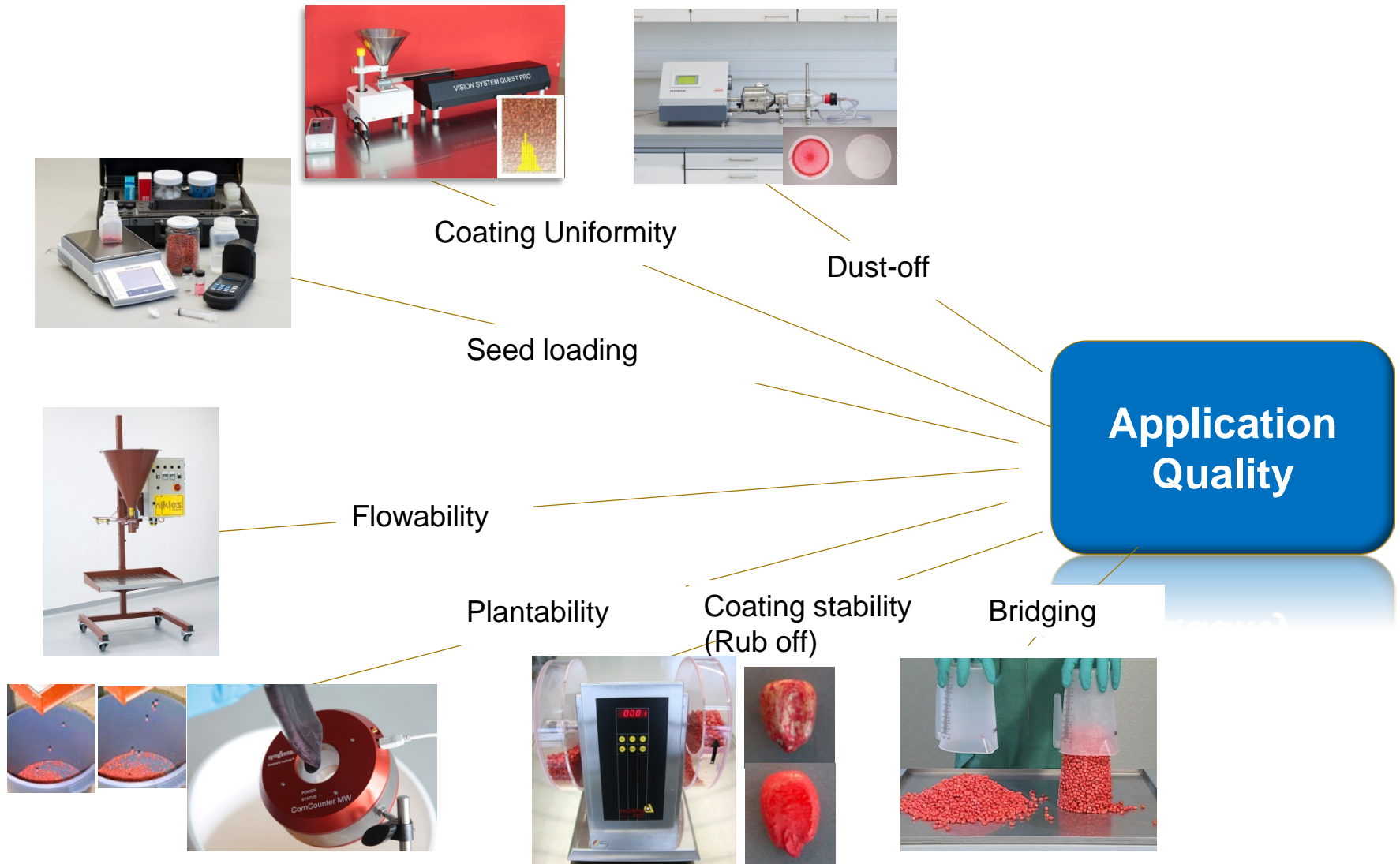
Treated Seed Quality = f (processed seed x recipe x equipment x training)

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Application and treated seed quality

Parameters and assessment



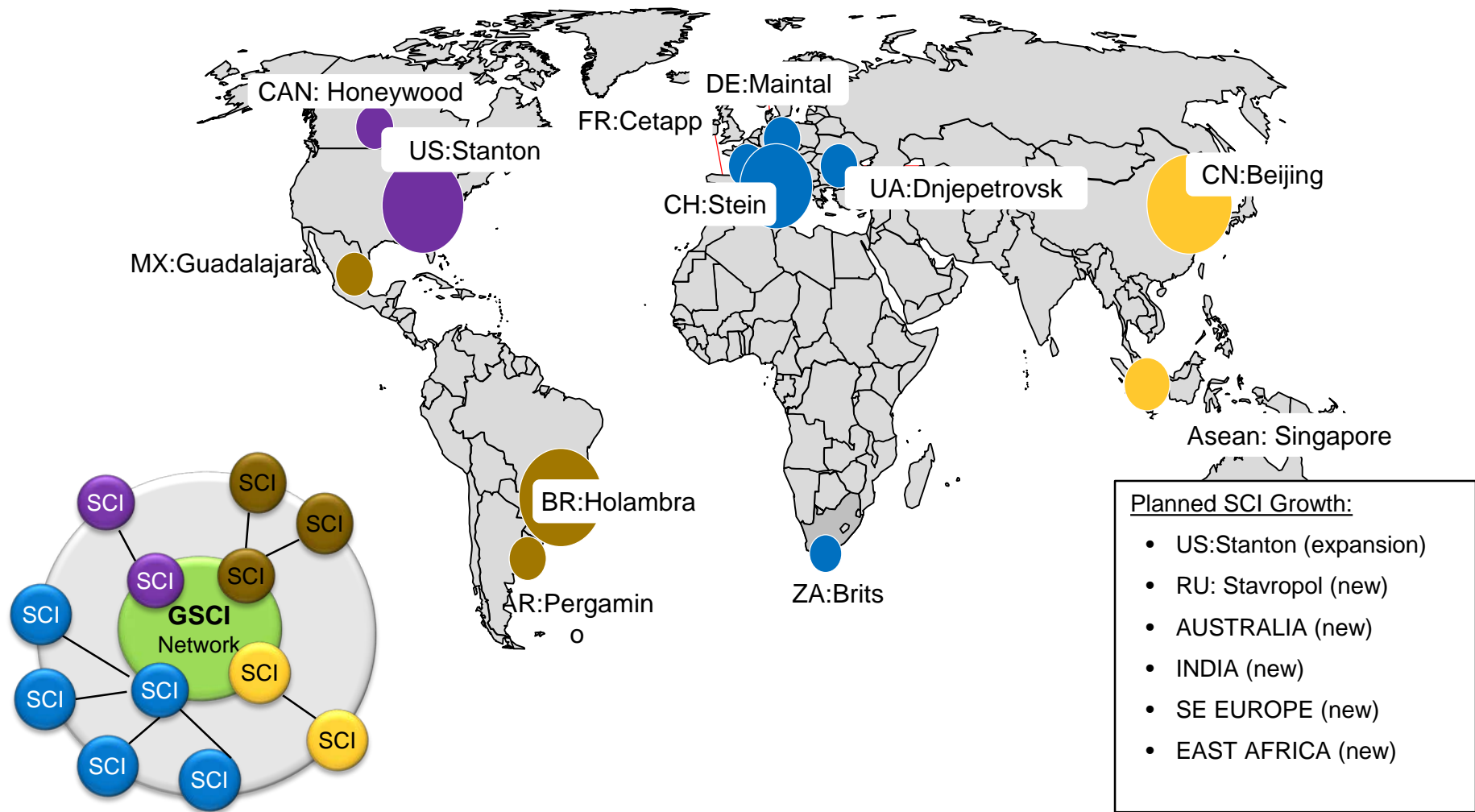
Impact of application quality on seed performance

Performance Criteria	Quality Criteria							
	Dust-off	Seed Loading	Coating Uniformity	Coating Stability	Flowability	Bridging	Plantability	Training
Biological Activity								
Disease/Pest Resistance								
Seed Safety								
Label compliance								
Seed factory efficiency								
Farmer Economics								



Very important

THE SEEDCARE - a global network of experts and facilities INSTITUTE



Global expertise – Local Delivery

Technical Service Pillars

Recipe
development

Application, QA
& Engineering

Seed Treatment
Stewardship,
Training &
Education

Seed Biology
and
Safety

Product
Marketing
Support

Global Expertise

THE
SEEDCARE
INSTITUTE

Coordination of

- Recipe Development
- Application Standards
- Quality Standards
- Engineering Consultancy
- Stewardship Programs
- Training Modules
- Seed Safety Protocols
- Product Marketing Support Projects

Local Adaptation

Local Delivery

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Execution of

- Recipe customization
- Application upscaling
- Troubleshooting
- Quality programs
- Stewardship programs
- Seed Safety tests

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Summary

- Seed treatment is a highly targeted and convenient crop protection technology
- Seed treatment delivers attractive benefits to seed companies and farmers
- Application and treated seed quality are critical to deliver these benefits
- Seed production and processing are key steps impacting application quality
- Seed treatment processes (application and recipe design) are highly sophisticated
- Seed treatment training is a critical step to achieve the best application quality
- Syngenta offers with THE SEEDCARE INSTITUTE a global network of experts and facilities to support seed companies in achieving best seed treatment application results