



We create chemistry

Breakout Session Seeds & Traits

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Canola Seeds & Traits

Dr. Andreas Sewing

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Vegetable Seeds

BASF Capital Markets Day

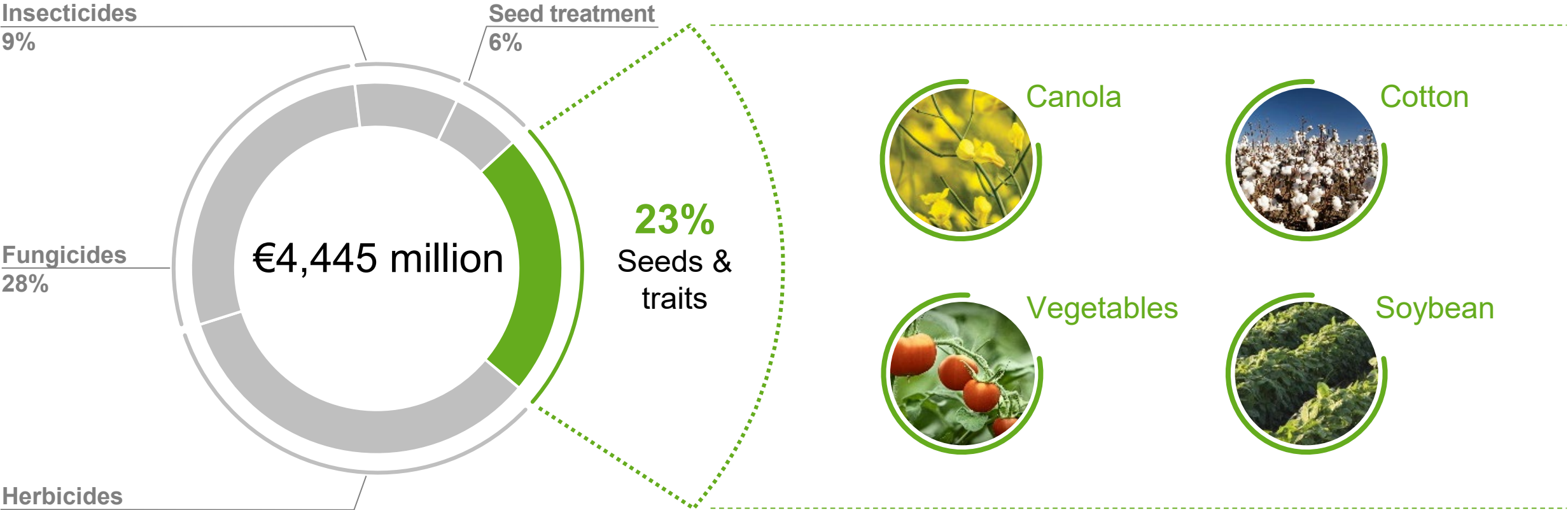
Ghent, Belgium, September 27, 2019

Cautionary note regarding forward-looking statements

This presentation contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 123 to 130 of the BASF Report 2018. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.

In H1 2019, seeds & traits accounted for around one quarter of the sales of BASF Agricultural Solutions

H1 2019 sales by indication and sector





 **BASF**

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InVigor[®] canola seeds business

Garth Hodges
Vice President
Global Business Management
Canola Seeds & Traits

Canola – heart-healthy oil crop low in saturated fatty acids



Meal

Oil

Seed

Pods

Flowers

Developed in the early 1970's

~24 million acres in North America, primarily for food used in frying and cooking

~17 million acres in Europe primarily used for biodiesel

The meal is a high-protein feed for animals

Canada exports over 90% of its canola production to the U.S., China, Japan and Mexico

The canola industry generates ~€17 billion¹ in value for the Canadian economy each year



InVigor[®] is a brand promise of new (revolution) and improved (evolution) products with exceptional performance

Revolution: Technologies and advanced breeding capabilities

Herbicide tolerance

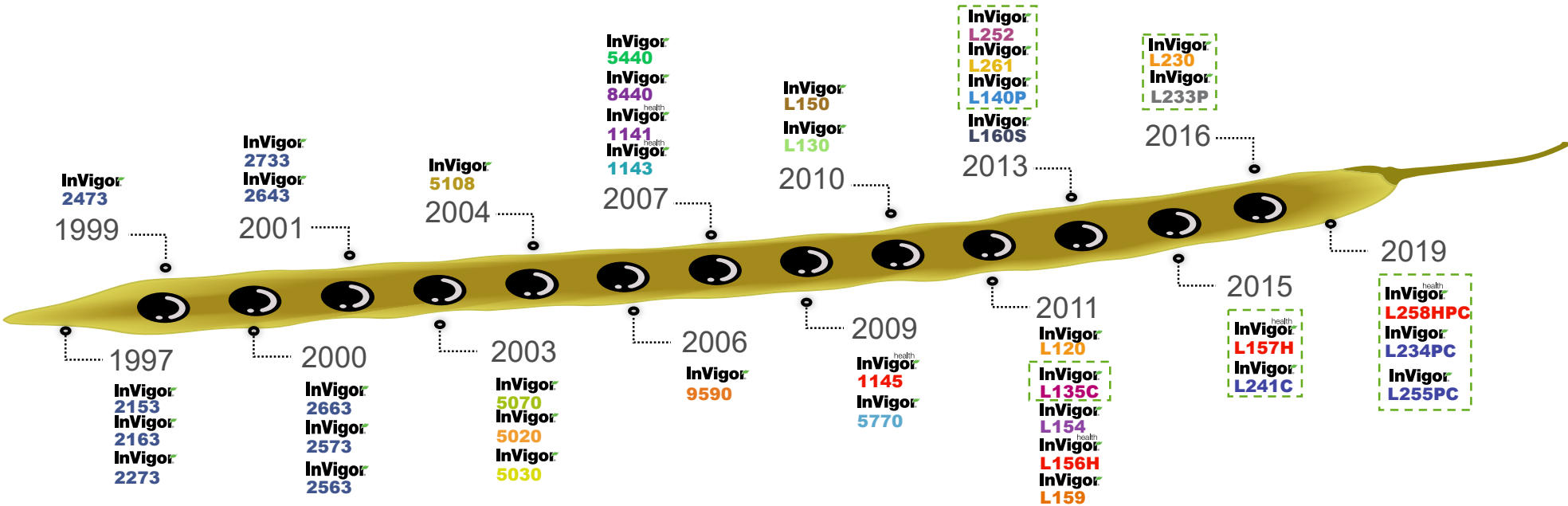
Hybridization

Pod shatter

InVigor[®] Health

InVigor[®] RATE

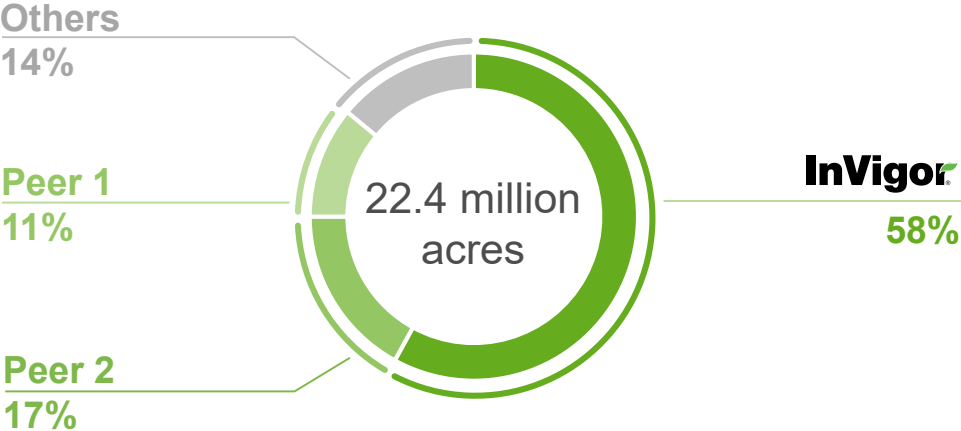
Evolution: Strong track record of product commercialization with exceptional performance



2019 Offerings

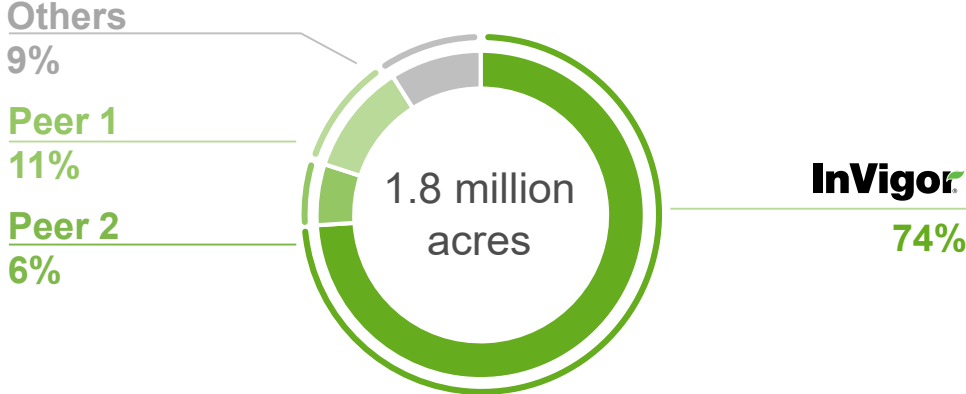
InVigor[®] segment-leading canola seed business

2018 Canadian canola seed, segment share



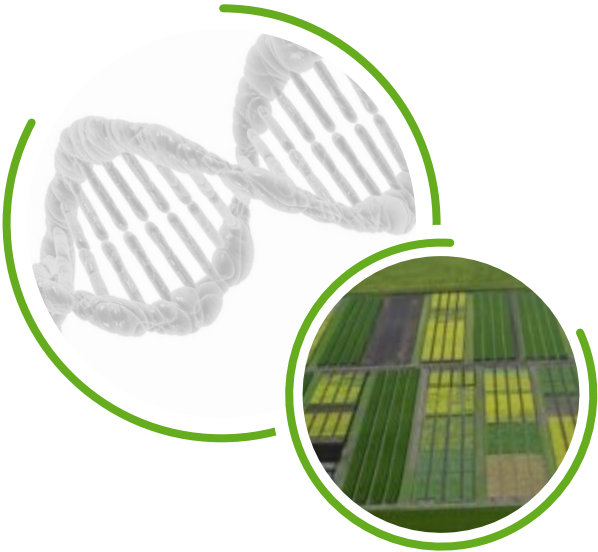
Source: AGDATA Inc.

2018 U.S. canola seed, segment share



Source: AGDATA Inc.

The continuum of the seeds business



Breeding and research



Innovative technology



Effective operations

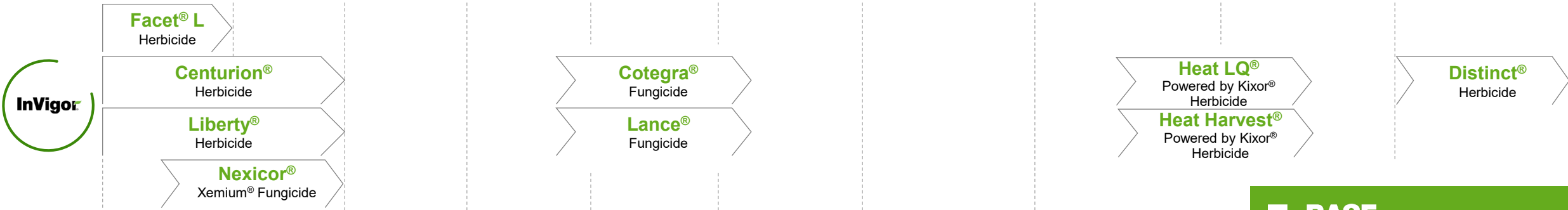


Sales and marketing

Continued investment in breeding and research plus the operational and strategic interconnection and interdependency is the most important principle for a successful seed business

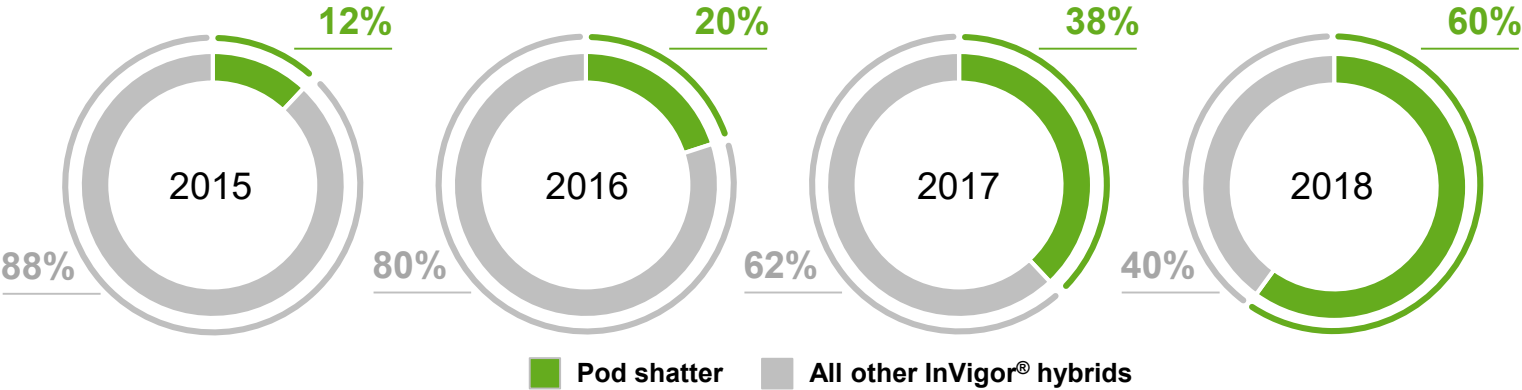
Canola production: High-performance seeds benefitting from BASF's leading crop protection products

BASF solutions for canola in Canada



Canola market drivers – impact of pod shatter reduction

InVigor® hybrids with pod shatter reduction technology



- Canola pods naturally shatter upon ripening, thus causing seed losses and reduction of yield
- Growers need to cut the canola (swath) prior to full maturity to limit losses, but seeds are not fully mature and some losses still occur
- Shatter tolerance is a revolutionary feature bread into InVigor® hybrids which prevents premature shatter and yield loss
- Growers can leave the plants until full maturity and directly harvest without the intermediate swathing step
- Benefits: Saves time, eliminates cutting costs, greater yields, more oil content, harvest flexibility

Pod shatter customers' Twitter testimonials



Straight cut over half the canola this year and couldn't be happier
#SellTheSwather

First time straight cutting. Might have to
#SellTheSwather

4-5 bu better on straight cut vs. swath. Time to
#SellTheSwather

Straight cutting some canola drown outs. I'm hooked
#SellTheSwather ;)



Revolution: Technologies and advanced breeding capabilities

InVigor® RATE

Optimizing yield, agronomic consistency and performance selling by seed count



Address growers' desire for ease-of-use and precision seeding concepts

Increase accuracy in forecasting sales when growers are seeding by targeted plant population

Further improve InVigor® brand image through a higher-performing product
 Demonstrate innovation leadership

Improved agronomy strategy

InVigor® Health

Canola oil with no trans-fatty acids and low saturates



- Utilize existing infrastructure to increase customer reach and segment penetration
- Leverage existing infrastructure to supply inventory needs
- Capitalize on top-quality germplasm base
- Access to high omega-9 canola trait
- Cross-license agreement with Cargill

Specialty-oil canola strategy

InVigor® – key takeaways

Seed is one of the first decisions a grower makes

Proximity to our customers means **direct accountability** – Keep promises and commitments

Yield is a priority

Quality is everything – Protect the brand promise

Seed is a unique emotional and scientific decision

Growers trust InVigor® on more acres than any other canola hybrid in North America



nunhems[®]

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Vegetable seeds

Dr. Andreas Sewing
Vice President
Research & Development
Vegetable Seeds

Vegetables as healthy choice for people and planet



Benefits to society

Scientific evidence supporting health benefits of fruit and vegetables



Convenience and eating as experience

Fostering healthy eating with flavorful vegetables and convenient formats



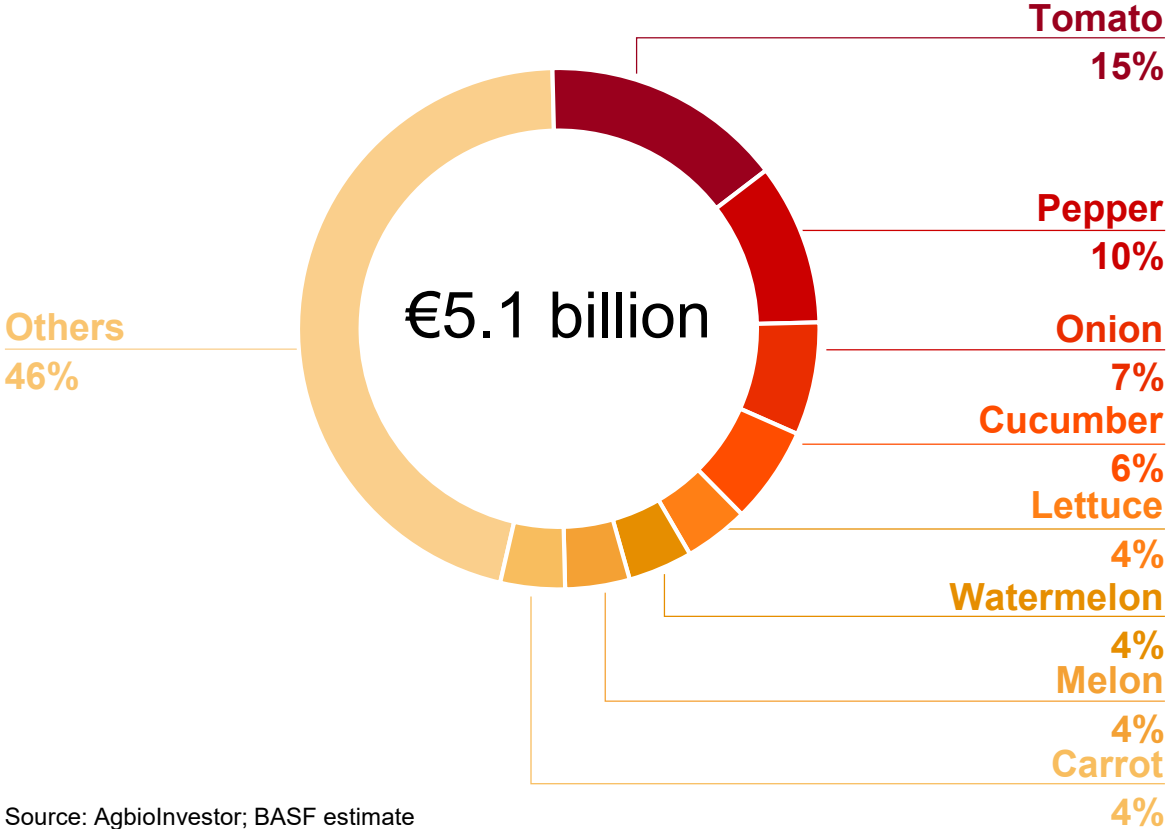
Sustainable solutions

Closed growing systems optimizing resource use and enabling production close to consumer

Global vegetable seeds market

Vegetable seeds market by product 2018

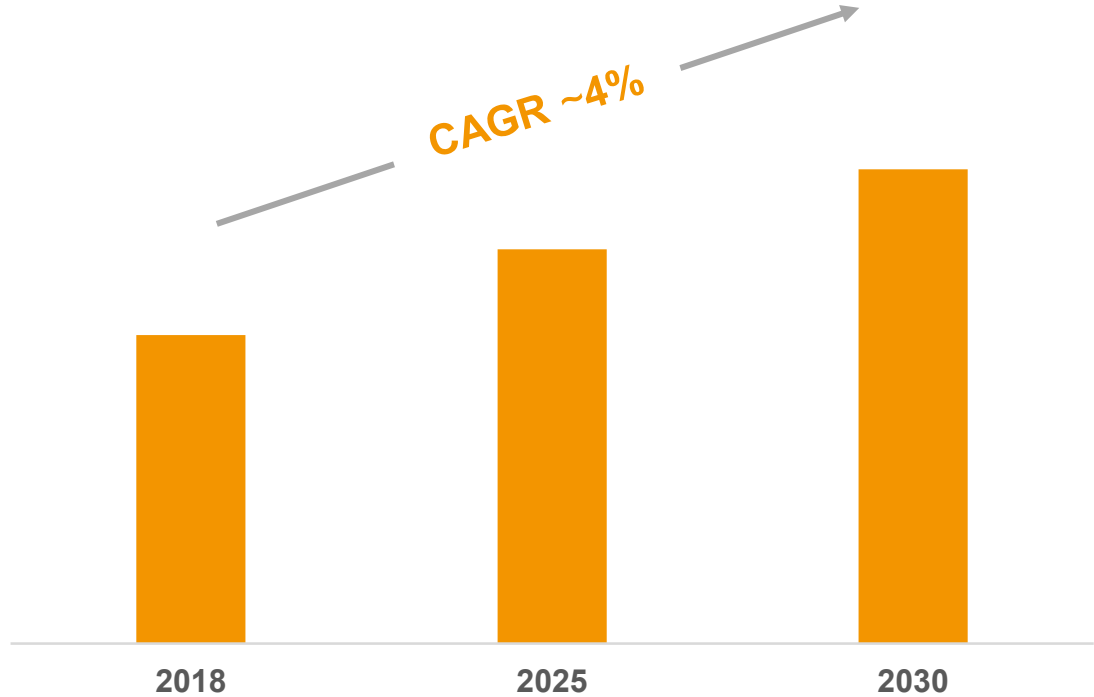
%



Source: AgbioInvestor; BASF estimate

Vegetable seeds market

million €



Vegetable market specifics



Row crops

↑	Acreage	↓
↓	Varieties	↑
↓	Output value	↑
↑	Price volatility	↓
↓	Consumer/retail power	↑



Vegetables

- Exclusively non-GM products
- Focus on genetic solutions (for disease and pest control)
- Highly fragmented market
- Non-processed consumption
- Complex value chain
- Consumer exposure

Delivering solutions across the whole value chain



Establishing yield

- Reducing input
- Heat set and tolerance
- Drought tolerance
- Earliness
- Harvest windows
- Advanced growing solutions

Yield protection

- Viral disease
- Bacterial disease
- Fungal disease
- Sucking pests

Processing qualities

- Shelf life
- Transportability
- Oxidation

Consumer value

- Taste
- Convenience
- Nutritional value

Development of native traits and genetic solutions
New growing concepts

Our contribution: Offering convenience with Kisy® – easy to eat and staying relevant to the consumer



Changing our traditional understanding of yield

Kisy®

Our contribution: Delivering value to growers by combining genetics and growing technologies



**Compact trait –
More output with less resources for
high-tech cucumber growers**

Trait results in open plant architecture, reduced leaves and compact growing habit requiring less space

- 20% more stems/plants per m² greenhouse
- Reduced labor for plant pruning
- Easier and automation amenable harvest

Our contribution: Adding value with new growing technologies



Indoor farming

- Reduction of product development timelines
- Seed production: more seed per m² and faster delivery times to customer



Hydroponics – soilless growing

- Closed systems maximizing yield
- Automated harvesting
- Working with growers to match genetics with growing technologies

Our contribution in the U.S. market: Sunions® – consumer solutions making the headlines

Integrated product development

Combining high throughput
technologies and
consumer taste
panels



*“VERY APEELING
Farmers have created a
new kind of onion that
won’t make you cry when
you chop them up.”*

The SUN, January 9, 2018



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