



# *Horticulture Megatrends: Challenges and Opportunities for Vegetable Growers*

CROP Innovation & Business  
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**SVP, Head of Vegetable Seeds**  
**R&D, Bayer Crop Science**











# Vegetable Seeds: Our Purpose



**We will provide**

**integrated, innovative** and  
**tailored solutions** to sustainably  
supply the world with nutritious  
and delicious fruits and vegetables.



**2,600+**  
Employees  
Worldwide



**46**  
Research  
facilities



22-crop portfolio  
of more than  
**2,000+** Varieties



# Vegetable Seeds: Our Brands



De Ruiter™



Protected culture  
products grown in  
glass houses and  
other structures

  
Seminis®



Open-field Products  
grown outdoors





# Trends Influencing the Food Value Chain

Competitive	Consumers	Retailers	Grower Economics	Technology
<ul style="list-style-type: none"> <li>// Major ag investments</li> <li>// Partnerships across sectors</li> <li>// Non-traditional competition</li> <li>// Consolidation</li> </ul>	<ul style="list-style-type: none"> <li>// Want “natural,” organic, local</li> <li>// Transparency</li> <li>// High-quality sensory experience, year-round</li> </ul>	<ul style="list-style-type: none"> <li>// Looking for opportunities to differentiate produce segment</li> </ul>	<ul style="list-style-type: none"> <li>// High labor costs &amp; low availability</li> <li>// Tight margins = looking for operational efficiency</li> <li>// Rising input costs</li> </ul>	<ul style="list-style-type: none"> <li>// Advances in biology = faster genetic gains</li> <li>// Confluence of biology, robotics &amp; IT</li> <li>// Venture capital</li> </ul>

# *Population Changes Challenge Current Food Chain System and Create Polarization*

## *Changes*



**Urbanization**



**Convenience**



**Transparency**

## *Solutions*



**Advanced  
Horticulture**



**Digital  
Tools**



**Data  
Analytics**

# Genetics is a Key Enabler for Innovation

## HISTORICAL

### Processing Tomato



## CURRENT

### High-Tech Glasshouse



## TRENDING

### On-Farm Efficiencies





# R&D Pipeline: Developing Vegetable Seeds for Marketable Yield

## Pfeiffer Pepper



- Sun-scald protection for fruit
- High-yield potential
- Unique disease resistance<sup>1</sup> package (Tomato spotted wilt, powdery mildew, and Phytophthora blight)

## Torelino Tomato



- Excellent taste
- High-yield potential
- Unique disease resistance<sup>1</sup> package (Powdery mildew & leaf mold)

## Whitex Cauliflower



- Bright white curd, supporting marketability
- Uniform curds/ easier harvest
- Excellent shelf life



# New Collaborations Needed to Meet Changing Production Needs

## “High Rise™ broccoli series: Hancock Broccoli



### Strategic Collaboration



### Traits + Technology = Solution

- // Clean stems for processing
- // High level of uniformity
- // Can potentially help growers achieve a more efficient harvest through fewer harvest passes and lower labor costs.



# *Traits of Interest for Vertical Farming Production*



Early & Uniform  
Fruiting



Rapid Biomass &  
Multi-Harvest Capable



Photo-Induced  
Quality Traits



Auto-Harvest  
Architecture



Dwarf Plants &  
Yield Efficiency





# Horticulture Digital Modernization



## Commercialization

- // E-Commerce Capabilities
- // Predictive Analytics



## Production

- // Vertical Horticulture, LED Lighting, Smart Glasshouses
- // AI & Digital Crop Optimization
- // Plant Factory Automation & Mechanization
- // Blockchain Traceability



## R&D

- // Advanced Breeding
- // Digital Phenotyping
- // Clean Seed





De Ruiter®





# Bayer Life Hubs: Connecting to the Innovation Ecosystem



Life  
Hub  
Boston

## Science & Technologies

// **Co-creating with the local tech ecosystem**

// **Positioning Bayer** as the partner of choice in AgTech



Life  
Hub  
California

## Biologics & Vegetable Seeds

// **Gaining insights from local ag ecosystem**

// **Hosting startups in CoLaborator spaces**  
to bring them close to our R&D & serve as  
a business development engine



Life  
Hub  
Lyon

## Societal Acceptance & Data Science

// **Engage with society** to listen, learn and share  
knowledge on the future of Ag


// **Incubating startups** to accelerate our research with  
new data science solutions








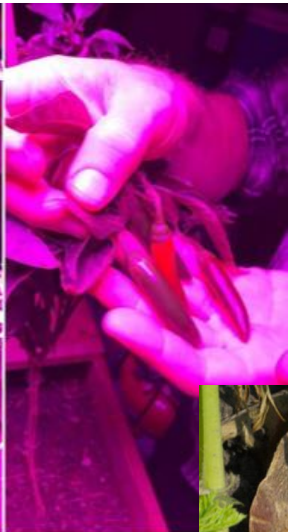

# We Must Find Better Ways to Connect with Consumers




jppbayveggies

Liked by vance.crowe and 59 others

jppbayveggies Back in October I moved my plants indoors under LED lights and it is working a charm extending my season by a few months! #indooragriculture #indoorplants #pepper #pe #chilepeppers #seminis #employee #ledlights #eatyourfruitsandveggies #growyourown #growyourownfood






Bitmoji John!

**Seminis Vegetable Seeds - United States/Canada**  
November 1, 2018 · 🌐

#NationalPepperMonth begins today! Dr. John Purcell, Head of R&D for Vegetables, gets us kicked off with this tasty Chorizo Stuffed Poblano Peppers cooking demonstration.

Let us know: what's your favorite recipe with peppers?



Video with your friends

Start Watch Party

5 Comments 10 Shares 9.9K Views

**We Can't Afford Simplistic, Binary Thinking When It Comes to Food Production**

Published on April 24, 2018

John Purcell | ✓ Following  
Head of Vegetables R&D, Crop Science at Bayer  
4 articles

135 5 29

As head of R&D for a major vegetable seed company, I get to travel around the world to meet with farmers and many other veggie-loving stakeholders from across the food chain.





# *Thank you!*



@jppbayveggies



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