How something this small can change the world

Hein Kruyt – CEO Solynta

Solynta
hybrid potato breeding

New crops for sustainable & healthy products

CROP Innovation & Business, March 28, 2022

Global Agricultural Challenges

Population growth: Solynta's HTPS will help meet the needs of a growing population, with food demand expected to increase 60% by 2050

Reduction of per capita cultivation area: Thanks to their small size, HTPS can be easily stored, transported, and sown

Climate change: HTPS can be bred to adapt to new climates, allowing growers to access the crop in previously limited geographies

Harvest losses: HTPS are bred to be resistant to common harvest threats such as insects, weeds, fungal diseases, and storage damage

Limited resources: The potato does not require significant water consumption for successful cultivation, and clean starting material will reduce reliance on chemical pesticides and other pollutants

Global Agricultural Challenges

We have to feed more people
on less land, with less inputs, less water, less waste
and robust to changing climate

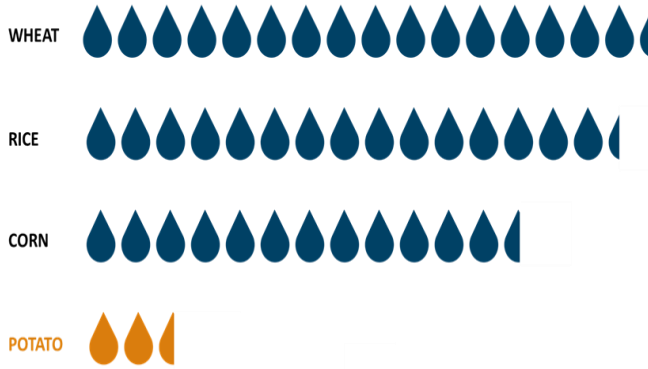
What if we could…

Significantly reduce
world hunger?

Dramatically reduce
pesticide and chemical usage?

Reduce **agriculture's impact on the climate?**

Reduce agriculture's
fresh **water usage?**



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What if ..
These solutions come from this **tiny seed?**

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22159

858,574,892 Undernourished people in the world

22,072 People who died of hunger today

Solynta's breakthrough unlocks potato's uncontested potential

Food mega trends

Potato, next to being already a €80 billion market, benefits from global food mega trends that are favorable for future growth:

- The world needs more food…
- …more nutritious food…
- …with less agro-chemicals and less water…
- …and resilience to climate change

Potato is excellently positioned to contribute:

"The potato produces more nutritious food, more quickly, with less water
in harsher climates than any other major crop"
FAO, 2008

Potato has two major drawbacks

1. **Lack of healthy starting material**
   Instead of sexual multiplication of starting material like in many other crops, potato relies on clonal multiplication making it extremely slow, bulky, contaminated with diseases, difficult to ship and store.

2. **Breeding is hodgepodge, chaotic**
   Leading varieties are over 100 years old, so no genetic gains realized over the last century
   demonstrated by Russet Burbank (1875) and Bintje (1903) still being leading varieties

Solynta solved these constraints, unlocking the potential of one of worlds most important food crops

The disruptive innovation

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Potato has two major drawback

Lack of healthy
Starting Material

Hodgepodge
Breeding

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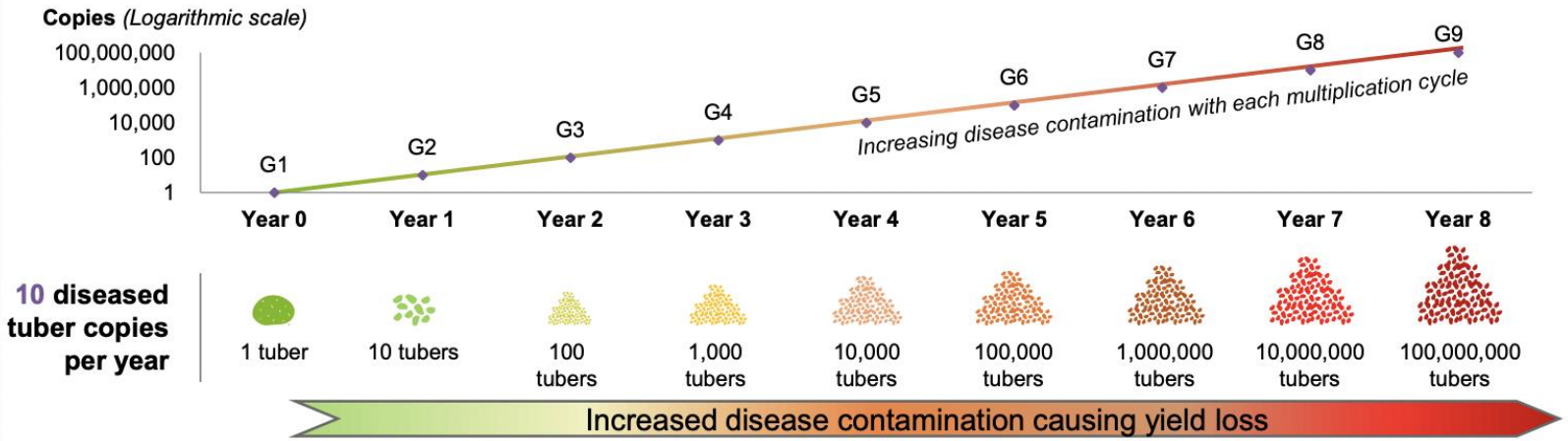
Comparison: Traditional Seed Tubers vs. Solynta True Potato Seeds

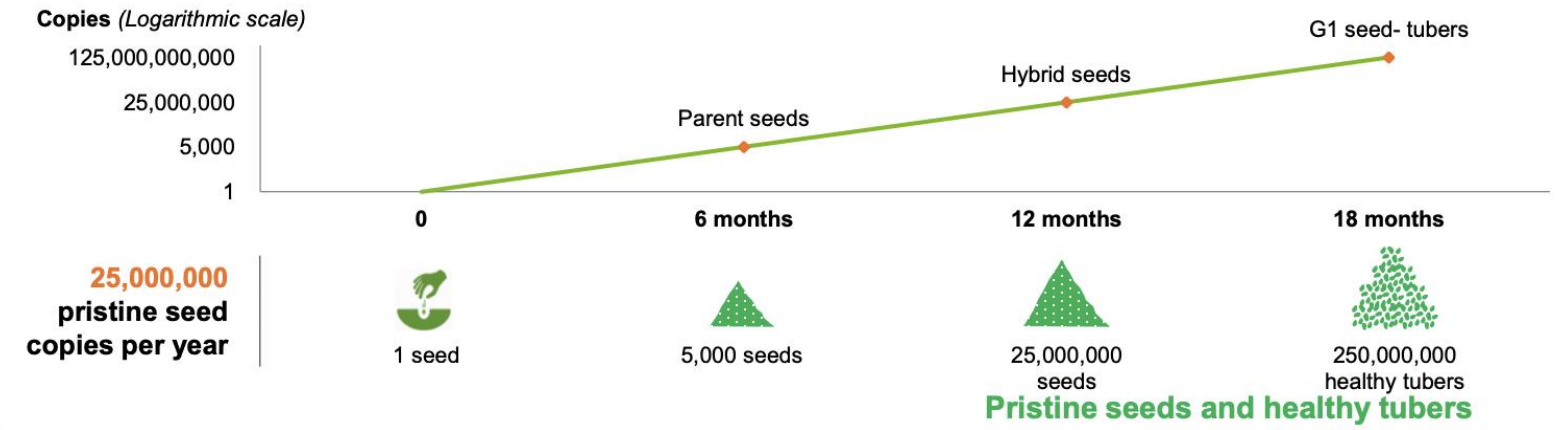
Traditional **seed-tubers**

10 diseased copies a year



Solynta's **True seeds**

25 million pristine copies a year



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Traditional Potato Breeding...

- Relies on seed tubers: **transportation issues**
- Seed tubers **prone to disease** and pests.
- Lacks **genetic diversity**
- Is **slow to scale** : most popular varieties were developed 150 years ago
- Requires **large volumes to plant** one hectare.
- Massive amount of storage space and transportation**: impact on planet**

Hybrid Potato Breeding...

- Produces true potato **seeds**
- Are **easy to ship and store.**
- Creates **disease-free starting material** for local farmers to grow their production.
- Is **fast to scale,** with 25 million copies produced per year.
- Allows researchers to **adapt potato to local circumstances and pest resistance**.

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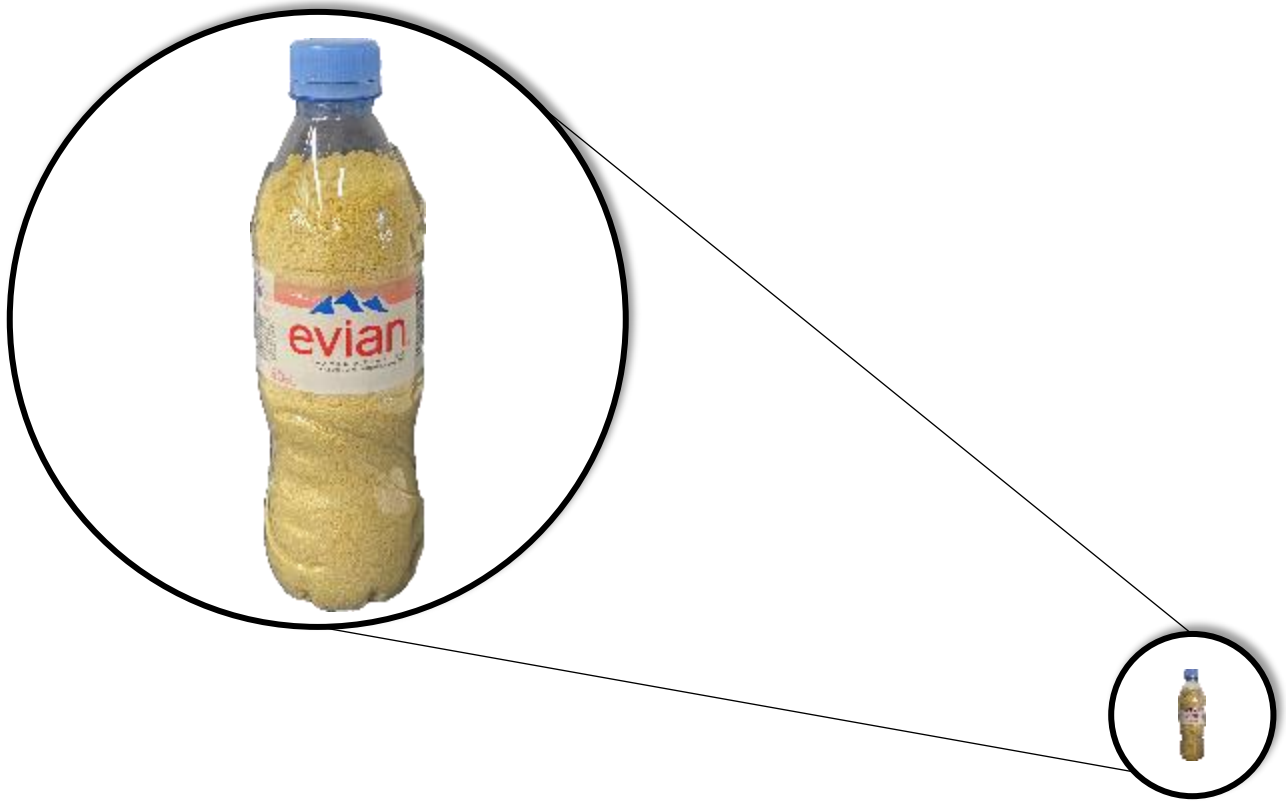
Problem 1 solved: true potato seeds are manifold smaller than seed-tubers and much easier to ship

A single 50cl water bottle holds ~1.5 million seeds, this is sufficient to plant ~30 hectares…



…which would require 60 pallets of regular seed- tubers

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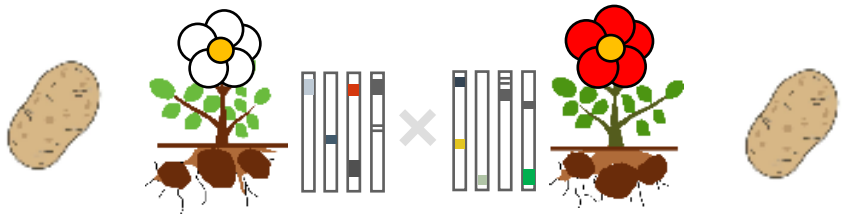
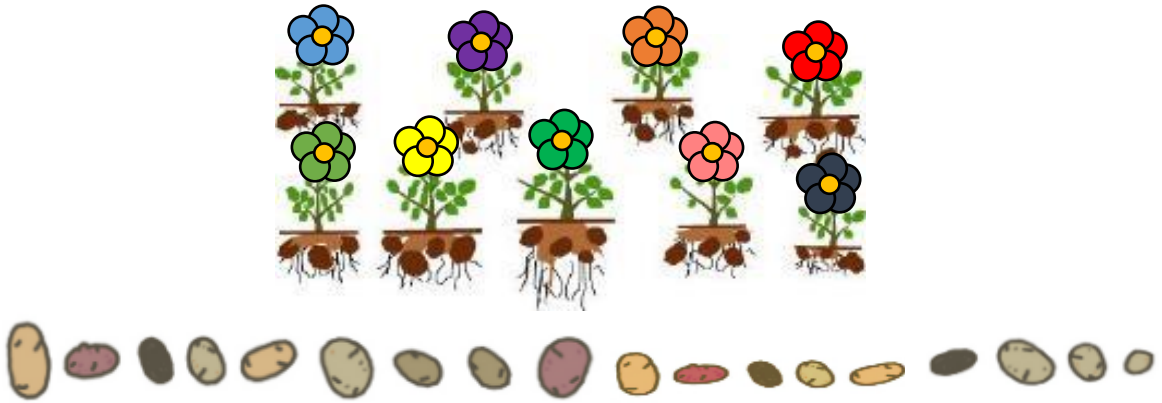
Traditional Potato Breeding

Traditional breeding is complex and unpredictable…



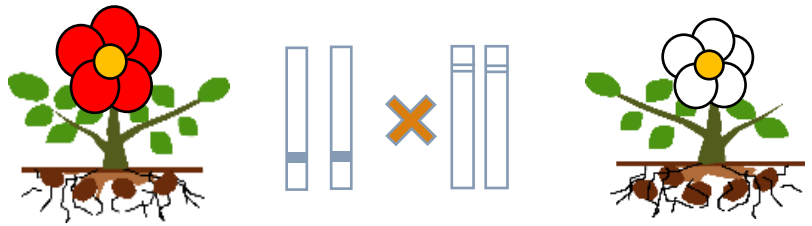
Genetically complex



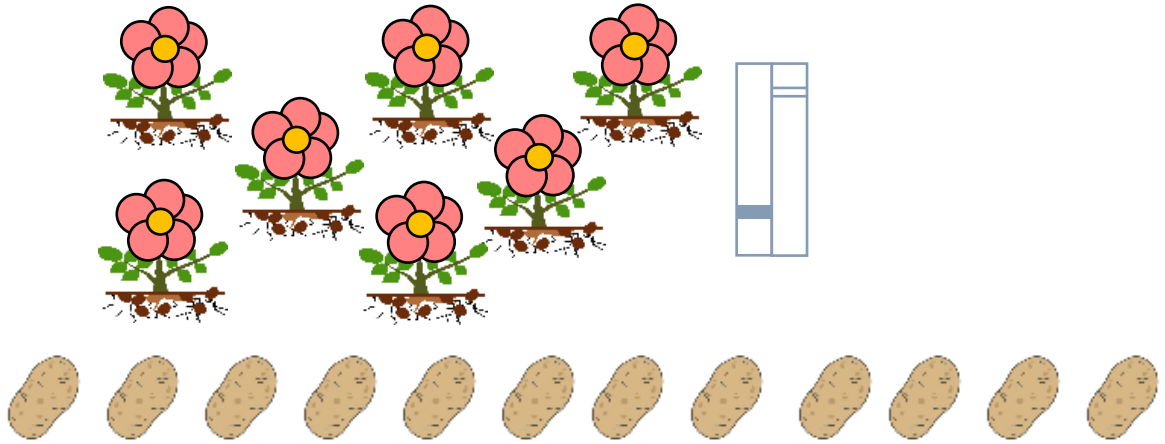
Breeding outcomes are random and unpredictable, selecting the best traits, crossing again, and repeating this takes 15-50 years

Hybrid Potato Breeding

Hybrid breeding is fast and predictable …



Less complex



Offspring is predictable and identical, selecting the best traits, crossing again, and repeating this takes 2-4 years

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We will double yields and half pesticide use within 7 years

1 kilo of true potato seeds

Is more valuable than 1 kilo gold

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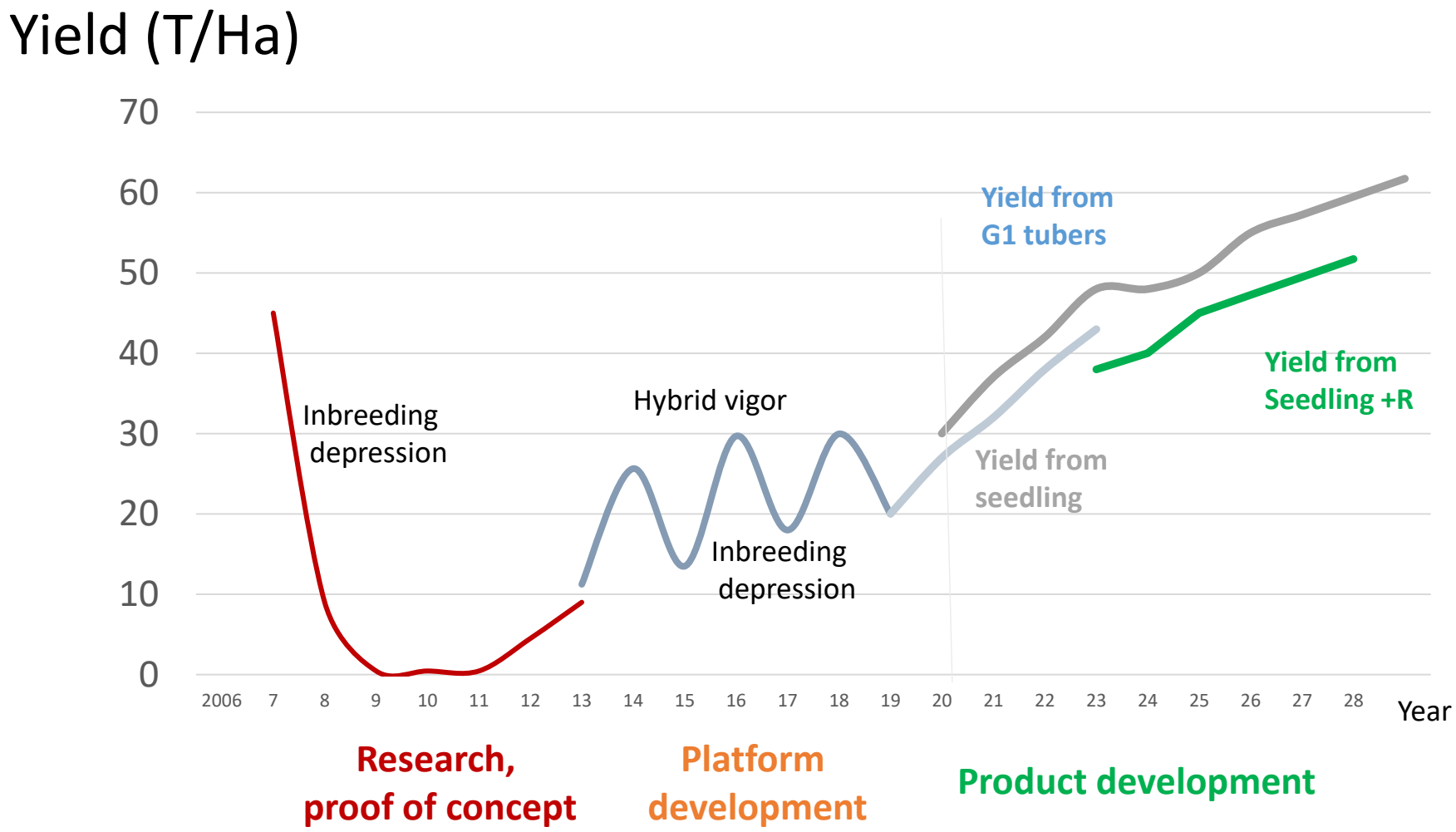
Pipeline development



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New crops for sustainable & healthy products

a scale-up perspective

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We make a lot of wrong assumptions, but if you wait till is sounds logical you are too late (bezos)

Edison

‘*Restlessness and discontent are the first necessities of progress’*

‘I have not failed. I’ve just found 10,000 ways that won’t work’

Lindbergh

‘I don't believe in taking foolish chances. But nothing can be accomplished without taking any chances at all.’

Mendel/ de Vries

„The striking-regularity with which the same hybrid forms always reappeared whenever fertilization took place between the same species induced further experiments to be undertaken“

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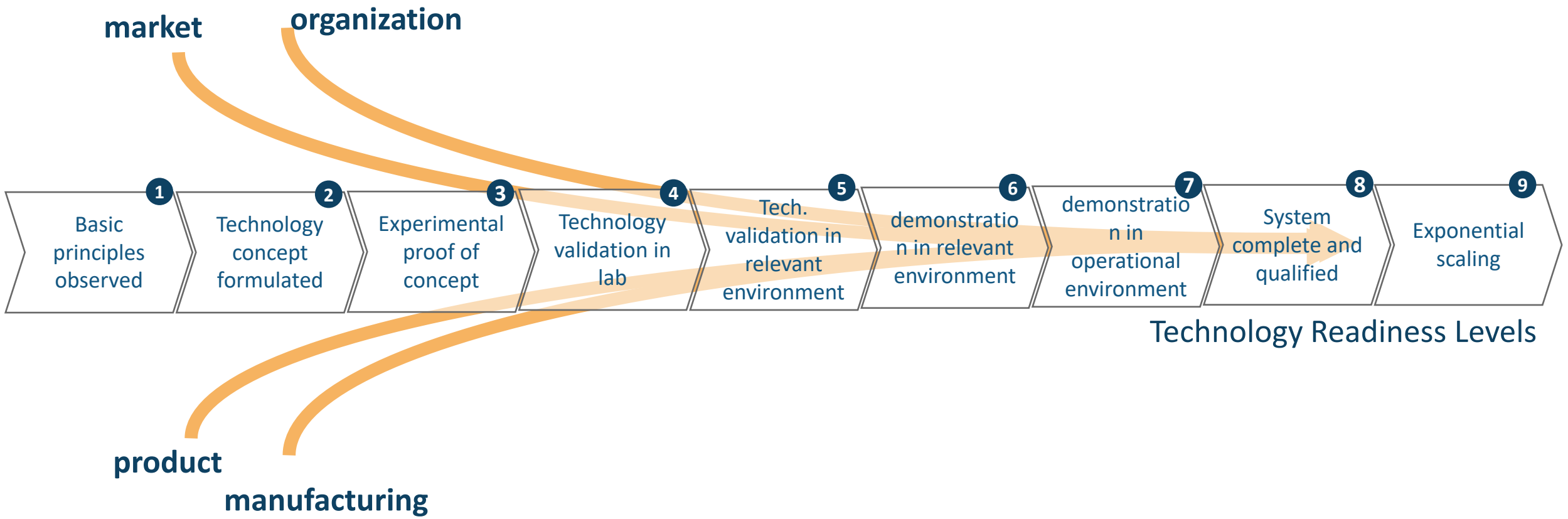
Commercialization Enabling Technology:



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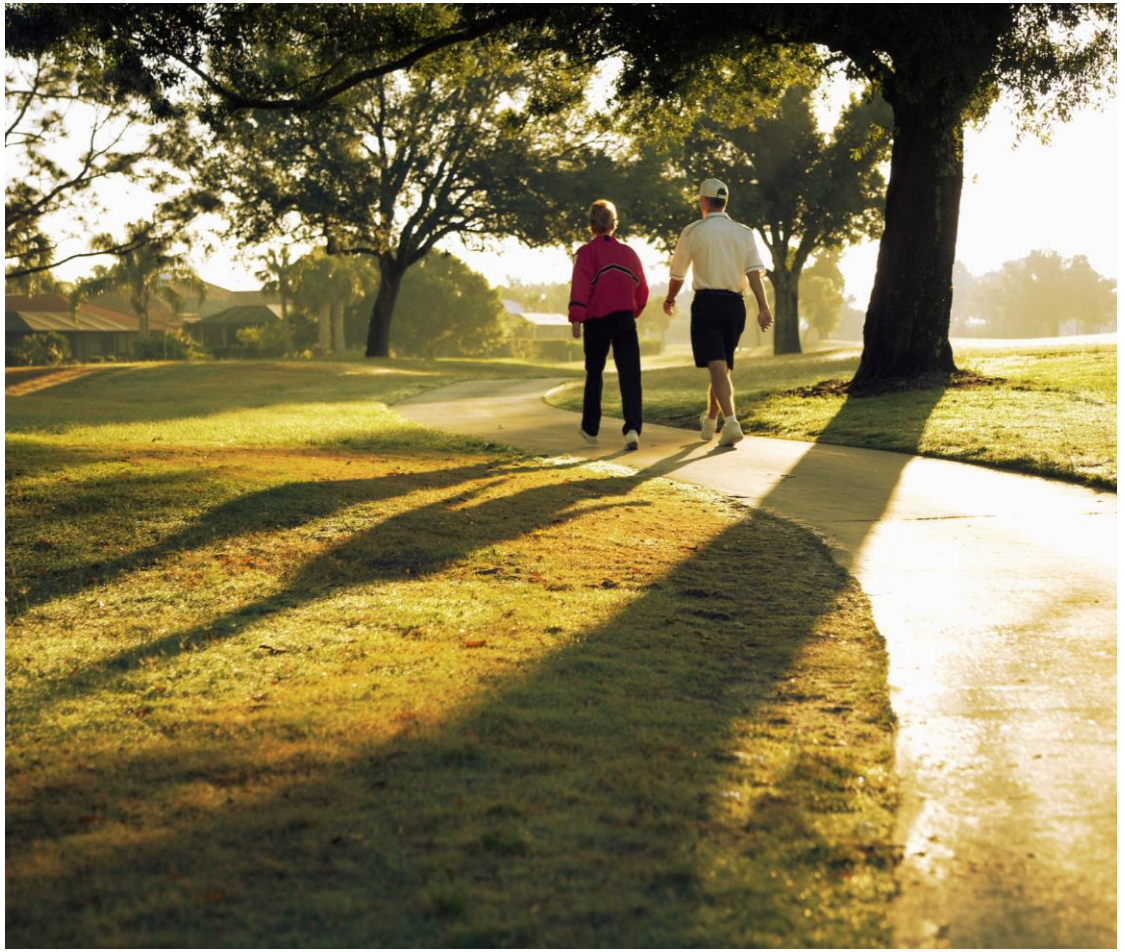
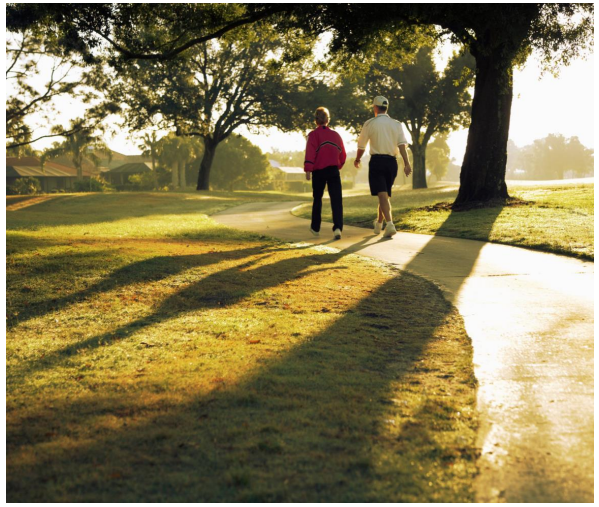
Only 0.5% of start-ups scale



But the secret of getting ahead is getting started (christie)

Only 0.5% of start-ups scale



Patent EU took more than 12 years
Variety registration protocol still not clear
Phyto legislation although disease free
Import impossible because it doesn't exist
Marketing directive EU
Gene editing still not allowed
And than, potato exist, it isn't even in novel food
Authorities mostly very willing to help, but God forbid if they wouldn't

Vested interest,
Innovator dilemma (christensen)

Royal Avebe: Strategic Imperative

Potato Starch
Potato Protein

Strategic imperative

Potato Yield

Lack of healthy starting material

Saturated high input markets

Lack of resistant varieties

Growing middle income

yield

62,327

0,383

Farm to Fork

- 65% of all pesticides is used on potatoes
- Potato covers 25% of agriculture land

50% less pesticides by 2030

- 1% is organic
- No durable resistant varieties (in NL)

25% organic in EU by 2030

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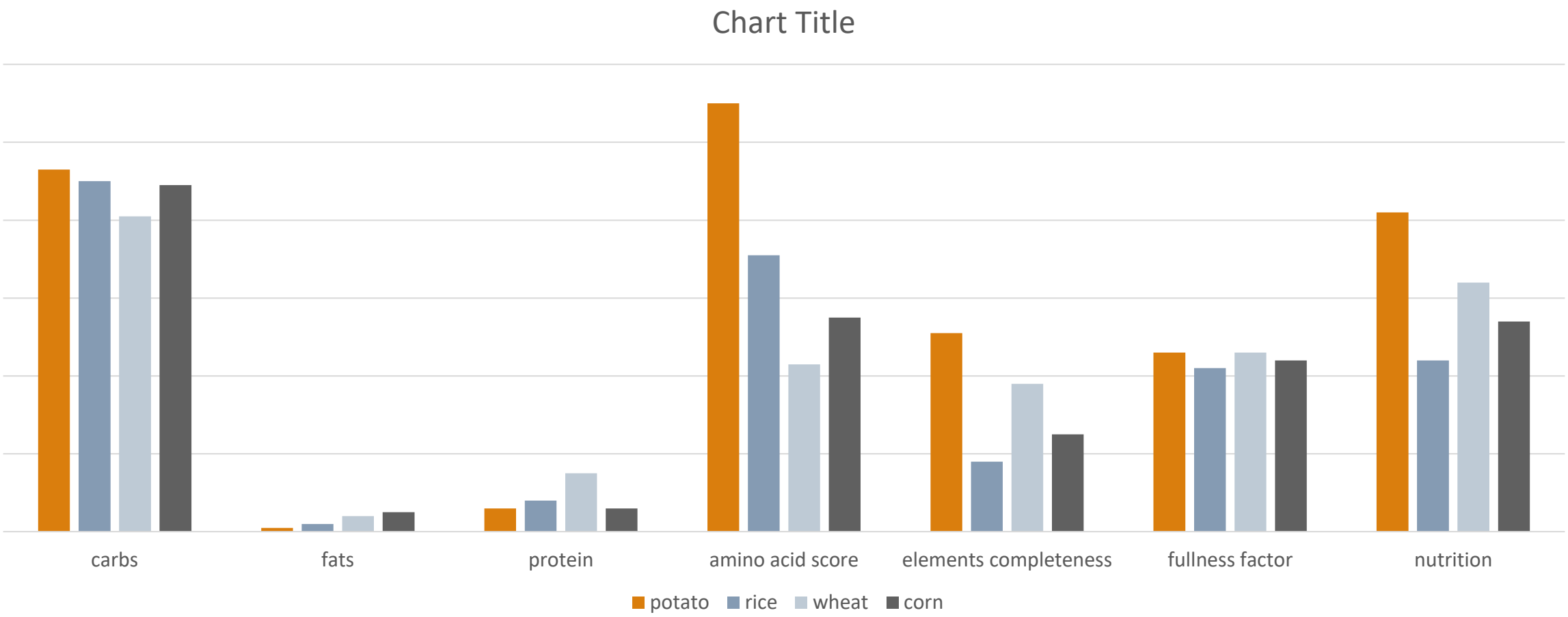
Potato is the vegetable from the large food crops



The Solynta journey continues – sneak preview
Experimental hybrids in the Netherlands @ harvest 120 field days
> 50 T/ha from seedling grown crop

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Solynta's mission

- To unlock the true potential of potatoes
- To provide hybrid potato innovations to enhance the livelihood of producers around the globe which will drive sustainable improvements in world food security.
- Using hybrid breeding technology, we will:
  - **Double potato yields**
  - **Dramatically reduce the use of pesticides**
  - **Improve food security and reduce hunger**

The Solynta journey continues
Experimental hybrids in the Netherlands
harvest @ 120 field days> 50 T/ha from seedling grown crop

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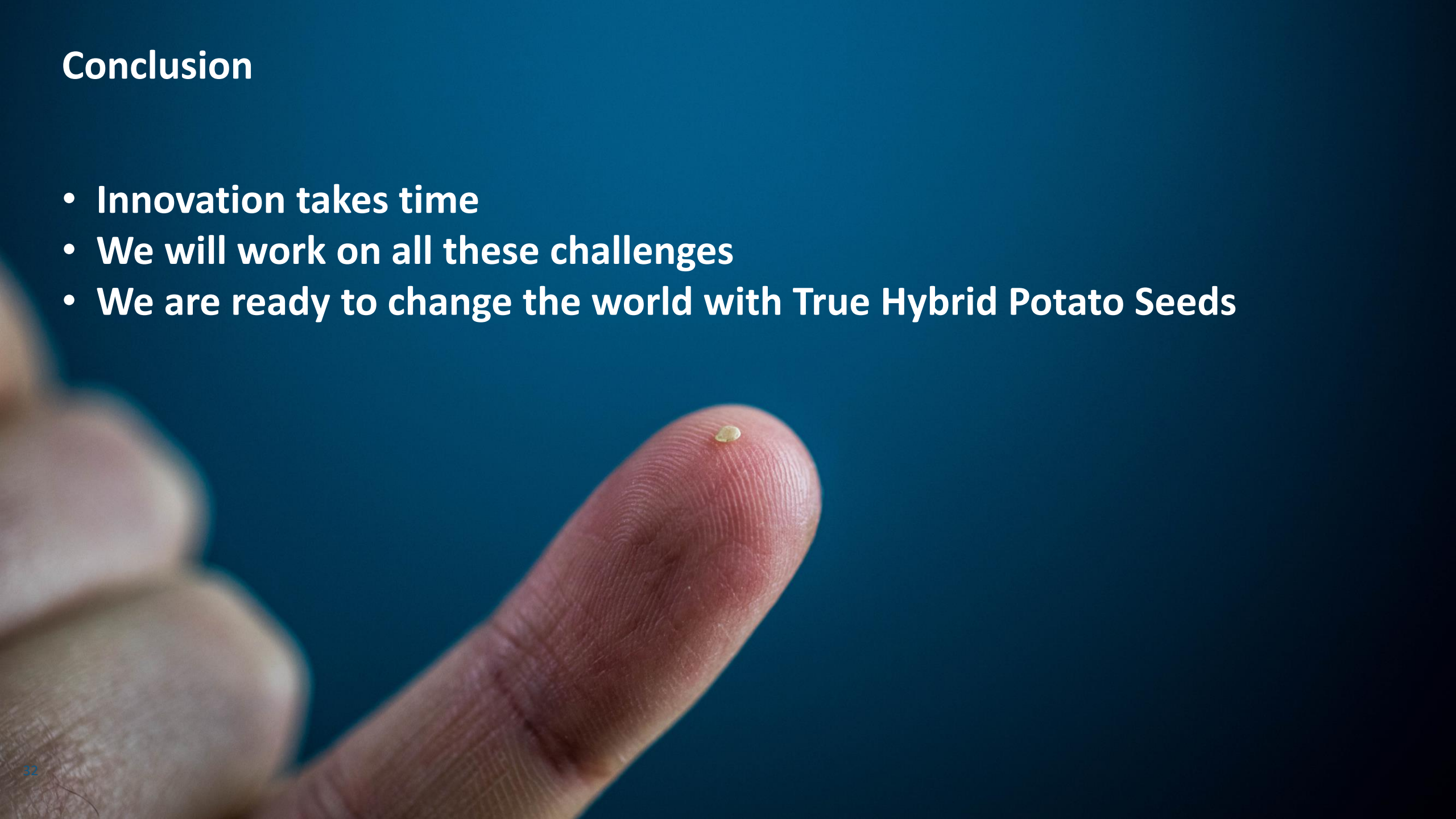
Tomorrow starts today

- Innovation takes time and perserverance
- All technical risk gone, but we are not their yet
- Exiting pipeline of valuable traits
- We are ready to change the world with True Hybrid Potato Seeds

Conclusion

- Innovation takes time
- We will work on all these challenges
- We are ready to change the world with True Hybrid Potato Seeds



Thank you

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