Emerging Technologies and Careers in Agricultural Research
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GLOBAL TRENDS IN AGRICULTURE

Agriculture is at the center of many of the global challenges facing humanity.

GLOBAL FOOD PRODUCTION

By 2050, need for a sustainable productivity increase.

+60% increase in food production required by 2050.

WEATHER FLUCTUATIONS

-322 kg rice per hectare yields under pressure.

+1°C increase in temperature.

POPULATION GROWTH

7.3 billion people on the planet today.

9.6 billion people in 2050.

HECTARES OF FARMLAND PER CAPITA

1950: 0.52
2010: 0.20
2050: 0.15

CHANGING CONSUMPTION PATTERNS

Increasing demand for protein.

INSUFFICIENT STORAGE

Up to 40% of fruit and vegetables lost in India.

Equivalent to the annual consumption in UK.

HUNGER

1 in 9 goes hungry today.

9.6 billion people on the planet today.
Over the last approximately 70 years, crop yield and farm productivity increases have been significant. 

Due to Ag Research!

Sustainable Agriculture will be required to overcome the global challenges in agriculture.

INNOVATION

Increased Crop Efficiency

RESPONSIBILITY

Strengthen support for smallholders

SUSTAINABILITY

Preservation of environment & biodiversity
Agricultural Research is an exciting and challenging arena to be a scientist.

- Genome editing
- Computational LifeSciences
- Robotics
- New players in ag
- Hydroponic farming
- Urban farming
- New product concepts
- Digital farming
Improvements in agricultural production and sustainability requires innovation in many scientific fields

Goal: Healthy, high yielding and high-quality plants
Crop Cultivation Innovations have to be integrated for maximum efficiency

**Plant breeding** creates “better” varieties by combining **natural characteristics** into a new variety.

**Plant biotech R&D** creates new characteristics (Traits) which are transferred to existing varieties by crossing.

**Chemicals and Biologicals** are applied to the seed and on the plants.

- **On-the-seed**
- **On-the-plant**

**License to 3rd party** (optional)

Feedstocks for food, feed, fiber, fuel

Breeded variety

Improved variety with new trait

Breeding variety

Crossing selection

Trait

Charsesed seed

Improved variety

License to 3rd party (optional)

Feedstocks for food, feed, fiber, fuel

Designed by Bart Lambert, October 2015
Precision agriculture and robotics are emerging as advances in sustainability.
Innovation is also needed in fighting hunger by enabling smallholders to increase food production where it is needed most.

Leveraging partnerships to bring smallholders access to:

- Agro know-how & training
- Price information & markets
- Credit & technologies

Pilot in India
Green Chili

Pilot in Kenya
Potatoes

“Bridging the Seed Gap” Project in Ethiopia
Vegetables

Farm to Market Alliance
Agricultural Research is One of the Most Exciting and Important Areas of Science Today

INNOVATION
Cutting Edge Multi-disciplinary Research

RESPONSIBILITY
Fighting Hunger and Improving Ag Practices

SUSTAINABILITY
Protecting and Improving the Environment

Questions?