



The 59th anniversary of Faculty Agriculture, University of Brawijaya
**Reshaping Agriculture Development for Anticipating Environmental
Disruption and Uncertainty on Market Competitiveness**



IMPLEMENTATION LIFE SCIENCE FOR IMPROVING AGRICULTURE PRODUCTION

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November 8, 2019



Current Global Issues Relating to Agricultures

- ◆ Climate Change
 - ◆ Pollution
 - ◆ Food shortage
 - ◆ Population Expansion
- 
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Challenges to Agricultures

◆ Challenges in Quality improvements –



◆ Challenges in Quantity improvements –



Challenges to Agricultures

◆ Challenges in Quality improvements –



- Higher temperature
- Drought
- Flooding
- Salinity increasing
- Pollutants
- Acid rain
- .
- .
- .



Challenges to Agricultures

◆ Challenges in Quantity improvements –

- Unit yield
- Efficiency of Production
- Pest resistance
- .
- .



Life science implements to Challenges

◆ Molecular level –

- **Enhance functions of heat-shock proteins**
- **Genes response to drought stress: SnRK2s and MAPKs (stomatal closure)**
- **Manipulating florigen: Gigantea (GI), Constans (CO), and Flowering locus T (FT)**
- **Enhance functions of metabolism of pollutants**
- .
- .

Trichloroethylene (TCE) Remove

Rabbit
cytochrome
gene into
Poplar tree

100 times
faster



Life science implements to Challenges

◆ Ecosystem level –

- Organic Agriculture
- Biodynamic Agriculture
- Xiu Ming Natural Agriculture
- Ancient Agricultures
- .
- .
- .

Apple Miracle



木村秋則

Thanks for listening!



Please don't ask hard questions!