Why the need for modern agricultural technologies?

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Agriculture in motion!

- Basic food requirement
- Green revolution
- Self-sufficiency
- Cutting-edge technologies
- The new agriculture
“Disneyfication” effect

- Business-driven
- Exciting
- Creative
Creativity can be subjective!

The New Toyota Cowrolla!
Outline

- Challenges facing agriculture
- Emerging issues in agriculture
- Cutting-edge technologies for today’s agriculture
- 21st century agriculture
Challenges facing agriculture

1) Resource scarcity

⇒ agricultural land
  • declining acreage
  • soil fertility problems

⇒ human capital
  • lack of skilled workers
  • age gap
Challenges facing agriculture ...(2)

2) Growing population

⇒ Malaysia  30 million

⇒ World  7 billion
Challenges facing agriculture ...(3)

3) Climate change

⇒ reducing the amount of land available for crop cultivation
⇒ decreasing crop yields
⇒ threatening food security
Challenges facing agriculture ...(4)

4) Technological pressure

- conventional agricultural practices cannot meet the current production demand
  - high quantity & quality of agricultural produce/products with minimum labor!
- K-factor
- high start-up cost
Challenges facing agriculture ...(5)

5) Oil politics

⇒ > USD100/barrel
  • snowball effect!
Emerging issues in agriculture

1. Biofuel production
   - feedstocks: palm oil, jatropha oil, …
   - food vs fuel

2. Product differentiation
   - one crop, many products (e.g. corn, oil palm)

3. Production efficiency
   - inputs (e.g. fertilizers, pesticides)
Emerging issues in agriculture ...(2)

4. Product traceability
   - food safety
   - Good Agricultural Practices (GAP)

5. Environmental protection
   - off-site nutrient loading
   - soil quality

6. Crop quantity vs quality
   - consumer preference
   - shifts in dietary requirement
Cutting-edge technologies for today’s agriculture

- Biotechnology (genetic engineering, tissue culture)
  - pest/disease resistant
  - high-yielding
  - shorter growing cycle
  - weather adaptation
Cutting-edge technologies for today’s agriculture ...(2)

- Forensic agriculture (RFID, gene fingerprinting)
  - traceability: from farm to folk
  - compliance to international trade requirements
Cutting-edge technologies for today’s agriculture ...(2)

• Precision agriculture

  ⇒ 21\textsuperscript{st} century agriculture!
  ⇒ enabler of ICT in agriculture