Benefits and Impacts of Emerging Precision Breeding
新興精準育種科技發展效益

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Emerging Precision Breeding is Supporting Development

- Precision Breeding
- Varieties
- Agriculture
- Food
- Feed
- Fiber
- Fuel

100B USD*
4,000B USD*

Source: TIER
*estimated from FAO Statistics (including Agriculture, Forestry, Aquaculture and Husbandry)
Benefits and Impacts

- **Improved Efficiency**
  - Increased value for research and development investments
  - Enables development of perennial crops
  - Reduced breeding costs from better animal health and welfare

- **Greater Productivity**
  - Reduces acreage used for agriculture
  - Controls genetic and vector-borne diseases
  - Adapts crops to suit changing environments (i.e. climate-adapted strains)

- **Met Preferences**
  - Breaking of unfavorable trait linkages
  - Can add traits to meet consumer preferences

- **Increased Diversity**
  - Increases crop diversity
  - Expands diversity beyond what is possible using meiotic recombination

Source: OECD
Improved Efficiency

From 7-25 years to as few as 2-3 years since its target-specificity effectively bypasses the need to go through a number of plant generations to achieve a particular genetic combination.

Gene editing could produce, in a single generation, one animal bearing both polled (without horns) and dairy merits, a result Hackett estimated, that would otherwise take 25 to 30 years of intense backcrossing of dairy and beef breeds.

Source: OECD
Greater Productivity

- High-yield Maize, Soybeans and Canola (improved photosynthetic efficiency)
- Hyper-growth Pig, Cattle, Goat, Sheep and Carp
- Easy-aquafarming Tuna Fish
- Starch Accumulation in Leaf and Stalk Tissue Maize
- Herbicide-resistant Canola
Greater Productivity

- Bacterial Blight Resistance Rice
- Powdery Mildew Resistant Wheat
- PRRS-resistant Pigs
- African Swine Fever Resistant Pigs
- Tolerance to Abiotic Stress (drought, cold, high salinity, nitrogen deficiency etc.): Soybean, Cotton, Corn, Rapeseed, Potato, Rice, Sugarcane, Tomato and Wheat
Met Preferences

- Hornlessness Cow
- Limit Heat Loss Pigs
- Low Phytate Maize
- Waxy Corn
- Anti-browning Mushroom, Potato and Apple
- High-GABA Tomato
- Healthier High-Oleic Low-Linolenic Soybean
- Low-gluten wheat
- Reducing sugars Potato
- Reducing acrylamide Potato
- Safer Xenotransplantation
Thank you for your attention!

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