For Sustainable Future: “A Seed Matters”

Beom-seok Lee
General Manager, International Cooperation Office, NACF, Seoul, Korea
Member Farmers (2.3m) → Invest → Member Coops (1,134) → Invest → National Agricultural Cooperative Federation (NACF)

Dividends on Equity & Patronage Refunds → Member Farmers (2.3m)

Dividends on Equity & Patronage Refunds → Member Coops (1,134)

Extension & Support Business → Member Coops (1,134)

Member cooperatives: Agriculture, livestock, ginseng, grain
Operational Structure

National Agricultural Cooperative Federation (NACF)

Brand Fees & Dividends

Invest

NongHyup Agribusiness Group

Invest

Agribusiness Subsidiaries

Invest

NongHyup Financial Group

Invest

Financial Subsidiaries

Brand Fees & Dividends

Dividends

Dividends
OVERVIEW ABOUT NONGWOO BIO CO., LTD.

<table>
<thead>
<tr>
<th>Company</th>
<th>NONGWOO BIO CO., LTD.</th>
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<tbody>
<tr>
<td>Foundation</td>
<td>1967</td>
</tr>
<tr>
<td>President</td>
<td>Yong Dong Chung</td>
</tr>
<tr>
<td>Value</td>
<td>259 Million USD</td>
</tr>
<tr>
<td>Employee</td>
<td>643 Worldwide</td>
</tr>
<tr>
<td>Head Office</td>
<td>114-8 Central town-ro, Yeongtong-gu, Suwon city, Gyeonggi-do, South Korea</td>
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<tr>
<td>Overseas Branch</td>
<td>China, America, India, Indonesia, Myanmar</td>
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<tr>
<td>Turn Over</td>
<td>87.1 Million USD (2015)</td>
</tr>
<tr>
<td>Business</td>
<td>Mainly Vegetable Seeds</td>
</tr>
</tbody>
</table>
An affiliate of NH KOSDAQ (since 2002)

Agbiotech R&D Based

Employees: 440 (domestic)

1st ranked sale in Korea; 30% market share

Nongwoo Bio Co.

KOSDAQ (since 2002)

An affiliate of NH

NWB was merged with NH on Sept. 1, 2014
Breeding Institute
Objective: development of elite seeds (F\textsubscript{1} hybrid)
Since 1998, about 1000 varieties have been developed; 500 F\textsubscript{1} varieties are sold in the market every year.

Biotech Institute
Objective: provide breeding tools and new genetic sources

Stock Seed Center
Objective: multiply stock seed and purity test of F\textsubscript{1} & stock
Food Security in Korea

National Agricultural Cooperative Federation
More people means more food

In the year 2050...

- Production of food and feeds will double
- Greater food consumption in developing countries (China, India, etc.)
- Production will decrease due to environmental disasters, crop diseases, insects, and the loss of cultivation area

<table>
<thead>
<tr>
<th>Year</th>
<th>100M People</th>
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<tbody>
<tr>
<td>BC 3500</td>
<td>0.35</td>
</tr>
<tr>
<td>AD 0</td>
<td>2.5</td>
</tr>
<tr>
<td>1650</td>
<td>5.5</td>
</tr>
<tr>
<td>1850</td>
<td>11.7</td>
</tr>
<tr>
<td>1930</td>
<td>20.2</td>
</tr>
<tr>
<td>1975</td>
<td>40.3</td>
</tr>
<tr>
<td>2000</td>
<td>60.0</td>
</tr>
<tr>
<td>2011</td>
<td>70.0</td>
</tr>
<tr>
<td>2025</td>
<td>83.0</td>
</tr>
<tr>
<td>2050</td>
<td>97.0</td>
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</tbody>
</table>
The great seed war

- 60% of seeds are sold by 4 major companies
- Germplasm is difficult to import and export
- Global seed market and prices grow continuously
Global Food Security Index

GFSI is calculated by levels of food affordability, food availability, quality and safety, obesity, and food loss. Korea ranks 26th worldwide in Global Food Security Index.
Countermeasures for Food Security

- Increase agricultural production
- Strategize for developing food industry
- Advance technologies for production and quality of crops
Targets for Food Production Elevation

Develop crops for:

- Resistance to environmental stress and abnormal climate change
- Resistance to crop diseases and harmful insects
- Production rate by manipulating crop physiology such as photosynthesis
- Nutrition, health, medicine, functional aspects
- High quality with taste, color and storage
- Less breeding duration and easy cultivation
Bottom Line

- Korea has to work hard for a food secure future
- Seed breeding can contribute to more resilient and nutritious crops
- Nongwoo Bio is on the cutting edge of preparing to meet Korea’s food security needs
Thank you!

Submitted as a country report for the 26th East Asian Agriculture Organization Council (EAOC) Top Level Meeting on Sept. 28-30, 2016, Taipei, Taiwan