How to reduce manufacturing and management costs of tractors and agricultural equipment

ECO-Diesel Engine

YANMAR FDS

HMT
Fig.1-1 Gross agricultural output (Total, Rice, Vegetables and Stockfarming)

Source: "Crop Statistics" Ministry of Agriculture, Forestry & Fisheries
Fig.1-2 Delivery of farm machinery
(Total, Tractor, Grain combine and Rice transplanter)

Source: "Survey of Status Machinery, Production" Ministry of Economy & "Survey of Shipment of Agricultural Machinery" Ministry of Agriculture, Forestry & Fisheries
Fig. 2 The number of agricultural machinery and Working hours per hectare

Source: "Census of Agriculture" Ministry of Agriculture, Forestry & Fisheries
Table.1  Comparison of working hours in rice farming (per hectare)

<table>
<thead>
<tr>
<th>Activity</th>
<th>1960</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1739</td>
<td>330</td>
</tr>
<tr>
<td>Seed preparation</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Raising of seedling</td>
<td>92</td>
<td>41</td>
</tr>
<tr>
<td>Tillage and soil preparation</td>
<td>170</td>
<td>42</td>
</tr>
<tr>
<td>Fertilization</td>
<td>85</td>
<td>18</td>
</tr>
<tr>
<td>Rice transplanting</td>
<td>266</td>
<td>47</td>
</tr>
<tr>
<td>Weeding/Herbicides</td>
<td>267</td>
<td>18</td>
</tr>
<tr>
<td>Control for irrigation</td>
<td>220</td>
<td>70</td>
</tr>
<tr>
<td>Control of insect/pests</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Mowing and threshing</td>
<td>574</td>
<td>56</td>
</tr>
<tr>
<td>Drying and preparation</td>
<td>58</td>
<td>17</td>
</tr>
<tr>
<td>Production management cost</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Source: "Survey on Farm Management & Economy”
Ministry of Agriculture, Forestry & Fisheries
Fig. 3 Agricultural machinery and implements cost in total rice production expense

Source: "Survey on Farm Management & Economy"  
Ministry of Agriculture, Forestry & Fisheries
Fig. 4 The price of rice purchased by Japanese Government (Brown rice)

Government purchasing price of rice (1,000 yen per ton)

Source: “Report concerned with the price of rice”
Ministry of Agriculture, Forestry & Fisheries
Fig. 5 Paddy field of planted acreage and reduced acreages

Source: "Statistics on cultivated land & planted area"
Ministry of Agriculture, Forestry & Fisheries
Fig. 6 The number of farm households classified by full-time and part-time

Source: “Report of survey on movement of agricultural structure”
Ministry of Agriculture, Forestry & Fisheries
Fig. 7 The rate of commissioned acreage for rice planting work

Source: "Report of survey on movement of agricultural structure" Ministry of Agriculture, Forestry & Fisheries
Fig. 8 The mean service life of agricultural machinery

Source: "Report of survey on movement of used agricultural machinery" Ministry of Agriculture, Forestry & Fisheries
From the initial stage of a development, suppliers are involved in design activity. As a result, cluster delivery is carried out.

**Fig.9 Promotion of clustered purchase**

Steering column (40 parts)

Pedal assembly (50 parts)
Fig. 10 Optimization of Production, Procurement and Distribution

: Industrial engines
: Marine engines
: Construction machinery
: Agricultural machinery
: Gears
: Parts
: Transmissions
In case of multipurpose combine harvester (120 – 145 PS)
- Period: 1993～1997
- Commercialization: 1994
- Supply of machines and components: See Figure 13
Fig.12 Structure of YANMAR combine harvester
Fig. 13 Supply of machine and components

Components of Sales Model: Large size (120-145 PS)

Development
- BRAIN

YANMAR
- Cutting Platform
- Threshing Device
- Travelling Device

B-Company
- Cutting Platform
- Threshing Device
- Travelling Device

NAME

Complete OEM

Investment for Molds and Stamping die

Sales

C-Company

D-Company