Virtual Workshop and Demonstration on Integrated Management of Straw Residue

STRAW MANAGEMENT PRACTICES IN INDONESIA

Indonesian Center for Agricultural Engineering Research and Development ,
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RICE AREA AND PRODUCTION IN INDONESIA

Indonesia total rice area (2019) : 15,955 mil ha/year
Average yield : 5,192 ton/ha
National rice production : 83,037 mil ton (unhusked rice)
Straw production : 90 mil ton
# RICE HARVESTING PRACTICES IN INDONESIA

<table>
<thead>
<tr>
<th>Manual</th>
<th>Semi mechanical</th>
<th>Mechanical</th>
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<tbody>
<tr>
<td>Sickles (cut straw 10-15 cm above the ground)</td>
<td>Sickles (cut straw 25-30 cm above the ground)</td>
<td>Paddy tripper (uncut straw left in the field)</td>
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<tr>
<td>Hand Beating</td>
<td>Trough in thresher machine</td>
<td>Combine harvester with trough in type thresher</td>
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<tr>
<td>Pedal thresher</td>
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<td>(cut straw 25-30 cm above the ground)</td>
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<tr>
<td>Whole/ Long straw Stubble 10-15 cm</td>
<td>Straw 30 cm Stubble 25-30</td>
<td>Combine harvester with hold type thresher</td>
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<td>(cut 5-7 cm above the ground, straw are chopped 5 cm and spread to rice field)</td>
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TRADITIONAL RICE HARVESTING PRACTICES IN INDONESIA

- Manual harvesting
- Pedal threshing
- Hand beating
- Stacked straw in rice field
RICE HARVESTING USING PADDY STRIPPER

Only rice grain are picked up by stripper, uncutted straw left in the field.
RICE HARVESTING USING COMBINE HARVESTER

Combine harvester with through in type thresher. The machine cut straw 25-30 cm above the ground

Combine harvester with hold on type thresher. The machine cut straw 5-7 cm above the ground
UTILIZATION OF STRAW RESIDUE IN INDONESIA

1. Burning
2. Decomposed and returned back to the field
3. Animal feed / fodder
4. Industrial material (Paper)
5. Energy (burning brick)
1. STRAW BURNING PRACTICES IN INDONESIA

- Before 2009, 85-90% farmers burn rice straw
- Purpose:
  - Eliminate straw from the field
  - Land preparation can be carried out soon after harvesting
- Impact:
  - Emission of GHG: CO2, CO, CH4, PM, NOx and SO2
  - Loss of organic material and soil fertility
- In 2009, Indonesia Act No 41/2009 on “Protection of Sustainable Food Crops Land” was issued → Farmers are not allow to burn straw
- The number of straw burning practices has decreased, however up to now, some farmers still practice straw burning.
STRAW BURNING PRACTICES IN INDONESIA

Pile straw in rice field
2. RETURNED STRAW BACK TO RICE FIELD

Purpose:
1. Increase organic material
2. Increase soil fertility
   1 ha of straw approx. equivalent to: 41.3 kg urea, 5.8 kg SP36 and 89.17 kg KCL atau total 136.3 kg NPK
3. Improve soil phisic
4. Reduce emmission of GHG
5. Sustainable agriculture
2. RETURNED STRAW BACK TO RICE FIELD

Land preparation using tractor and its equipment
Crimpler/ finned roller → speed up straw to decompose in the soil
Plowing → inverse and buried stubble and straw in the soil
Rotary plow → mixed decomposed straw and soil
Pushing Straw into the Soil

Crimpler/ finned roller → best in very soft soil
Push straw in the soil, speed up straw to decompose
Land Preparation by Machine

Plowing: Inversing soil, burying stubble and straw

Rotavating: chopping soil, and mixing decomposed straw and stubble
Direct rotavating on soft/wet soil

Two Wheel tractor rotary tiller

4 wheel tractor with rotary tiller
Composting Straw for Fertilizer
In Situ Straw Composting Practices
3. STRAW FOR ANIMAL FEED/ FODDER

- Transporting straw from field
- Direct feeding fresh straw
- Feeding of dried straw
- Chopped fresh straw
Using Straw for Silage

Silage processing

Silage feeding
CHALLENGE OF STRAW UTILIZATION

Lack of labor
High labor cost
Farmer awareness
Lack of appropriate machine for straw management
  Collecting straw in the field
  Transporting straw from the field
  Processing straw into: compost, fodder, silage
Poor farm road
THANK YOU