



W04L01: Crop Residue Management

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Status of Crop Residues in India

- Approximately 700 million tonnes crop residues are produced in India on annual basis
- Cereal group (Rice, Wheat, Maize, Pearl millet, Barley, Small Millets, Sorghum) produce the highest amount of 368 million tonnes (54%) followed by sugarcane 111 million tonnes (16%)
- At individual crop level
 - Rice contributes highest (154 million tonnes)
 - Followed by wheat (131 million tonnes)

Status of Crop Residues in India

○ **State-wise: the generation of crop residues**

- Uttar Pradesh (approx. 60 MT) highest
- Punjab (approx. 51 MT)
- Maharashtra (approx. 46 MT)
- West Bengal (approx. 36 MT)
- Bihar (approx. 30 MT)

○ **Surplus crop residues (234 MT)**

- Rice (43.5 MT)
- Wheat (28.4)
- Sugarcane (55.7)
- Cotton (46.9)

(Source: Hiloidhari et al., 2014)

Burning and its consequences

- Emission of greenhouse gases (GHGs)
- Releases Particulate Matter (PM) and smog which pollutes air
- Killing of beneficial soil microbes
- Loss of soil nutrients

Crop Residue Burning in India (Approx. 100 MT) releases

- 8.57 Mt of CO
- 141.15 Mt of CO₂
- 0.037 Mt of SO_x
- 0.23 Mt of NO_x
- 1.21 Mt of PM

(Source: Bhuvaneshwari et al., 2019)

Machines for CRM

- ✓ **Combine harvester with SMS**
- ✓ **Happy Seeder** (used for sowing of crop in standing stubble)
- ✓ **Zero till seed drill** (used for land preparations directly sowing of seeds in the previous crop stubble)
- ✓ **Baler** (used for collection of straw and making bales of the paddy stubble)
- ✓ **Paddy Straw Chopper** (cutting of paddy stubble for easily mixing with the soil)
- ✓ **Reaper-cum-Binder** (used for harvesting paddy stubble and making into bundles)
- ✓ **Mulcher**

Value Added Products and other uses

- Animal feeds
- Electricity production
- Mushroom production
- Biochar
- Inert Material for Bio-fertilizer

- Mulching
- Preparation of souvenir
- Plates & Packaging material
- Ethanol Production

Challenges in Crop Residue Management

- Use of combine harvester without SMS
- Transportation cost
- High volume
- Scarcity of labour especially during the season
- Short window between two crops
- Lack of economic viable options