Innovation in Conservation Agriculture

ESCAP-SCO Side Event: Enabling Food Systems Transformation through Climate Smart Agri-Innovation
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Why CA?

- All agricultural soils show signs of degradation
- ¼ of the total arable land is degraded
- Climate change – droughts, water scarcity, crop yield decline
- Storms and desertification
- Raising input price
- Governments’ commitments to international agreements
- More focus on sustainable production
Why it is happening?

Conventional agriculture based on ploughing and residue burning causes:

- Soil erosion
- Loss of CO₂ and organic matter
- Air and water pollution
- Soil compaction
- GHG emission and climate change
- Destruction of biological life & processes
What is CA?

1. **Minimum mechanical soil disturbance** (i.e. no tillage) through direct seed and/or fertilizer placement.

2. **Permanent soil organic cover** (at least 30 percent) with crop residues and/or cover crops.

3. **Species diversification** through varied crop sequences and associations involving at least three different crops.

**Innovation:** Precision in land preparation, prevents residue burning, prevents soil erosion, improves its health and fertility followed by increased crop yield and farmers’ income.

How does CA work?

Conventional Agriculture

Low Soil Organic Matter

Action of Soil Biota
Structure/Porosity
Soil Health

Soil Organic Matter = Drought Tolerance

High Soil Organic Matter

Conservation Agriculture

Biological Tillage

Mechanical Tillage
What are the benefits of CA?

CA is a Climate Smart Approach that provides ecosystem services and sustainably increases yield, production and profit.

• Reduces soil erosion
• Improves soils health, structure and water infiltration
• Reduces CO2 emissions and contributes to climate change mitigation
• Improves water, nitrogen and carbon cycling for healthy environment
• Less fertilizer, pesticides, energy, labour and water
China, Kazakhstan, India, Pakistan and Iran are actively expanding CA.

CA Alliance for Asia-Pacific (CAAAP) hosted at the Conservation Tillage Research Centre (CTRC) at the China Agriculture University, Beijing.

Globally 205 M ha in 2018/19 (15% cropland)
What is the proper machinery for CA?

Most of the available drills/seeders are for the large scale production, heavy and not always respond to the requirements.
What innovation is being done for machinery?

No-till drills for small farms, planting cover crops, equipment for chopping, moving and rolling the green biomass
How to further promote CA?

- Document, demonstrate and upscale successful experiences
- Provide policy support (legislation, strategies, incentives)
- Capacity development for leaving no one behind (gender, youth, etc.)
FAO Global Conference on Sustainable Agricultural Mechanization (GAMC)

Theme: Efficiency, Inclusiveness, and Resilience

Rome, Italy
27-29 September 2023

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