

Up-Scaling Sustainable Mechanization in India

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|| CIMMYT

Sustainable Mechanization & Intensification

- **Supporting/Enabling elements** – Declining Farmers income, Labour Shortages, Degradation of Natural Resources (Soil, Water & Environment), Climate Change & Sustainability of Agriculture
- **Challenges** – Land Holding, Economic Condition, seasonal use , size & shape of Fields, terrain, machine v/s Labour and mind set (CA Course)

Sustainable Mechanization & CA

Three Principles

- No/Minimum Tillage
- Soil Cover with residue
- Crop Rotation

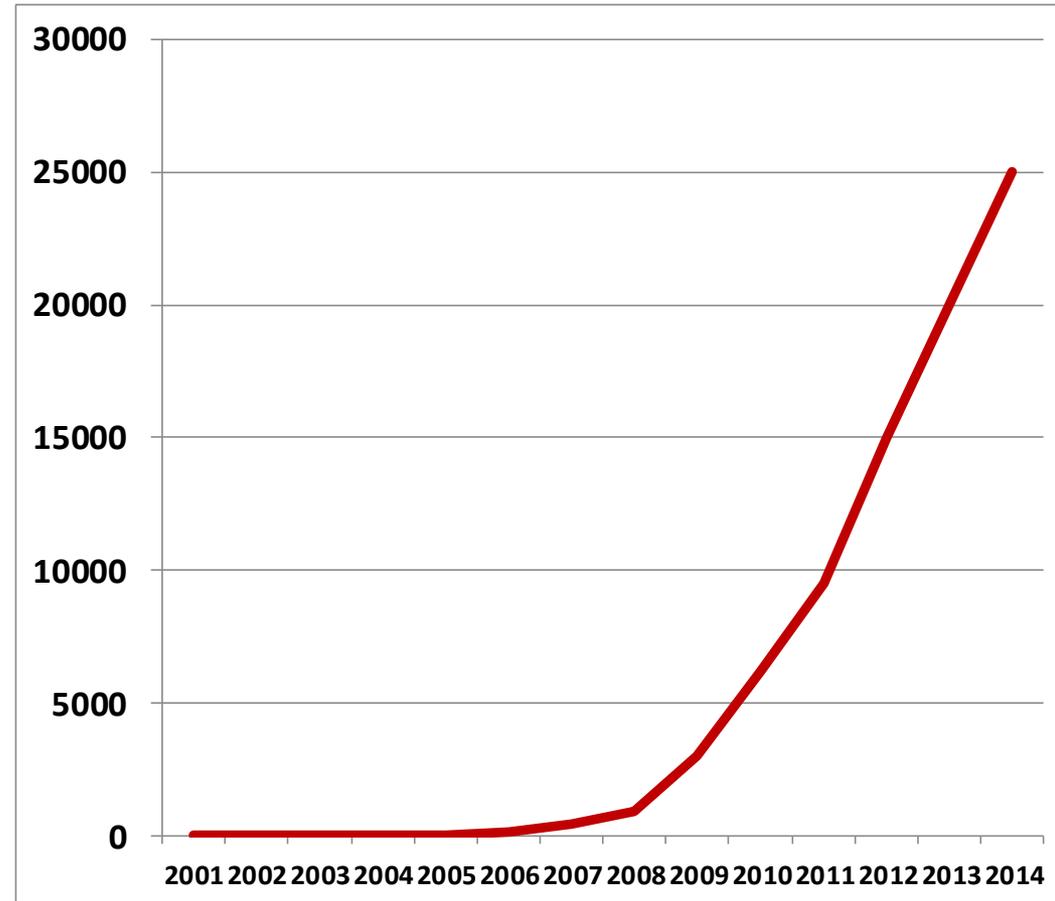
Three Benefits

- ✓ Enhanced Productivity
- ✓ Richer Resources
- ✓ Climate Adaptation

<<<<<<<<< Choosing Directions >>>>>>>>

- System Approach & Un-sustainability can not be the option
- It need to be biophysically and socio-economically sustainable.
- Sustainability also demands confronting climate change

New Auto survey Laser land leveling - CA Pre-requisite



Farm level benefits

- No Manual Surveying or Guess work setting
- Sniffer Bucket with Auto Survey
- 30 v/s 3000 observations
- Auto setting & min. chance of error
- 30 % saving in time & fuel/energy
- **5000 USD v/s 6000 USD (20%)**

Source: Sidhu et al (2008) , Jat et al, 2009a,b,2011

Burning Issue of Residue Burning & SI



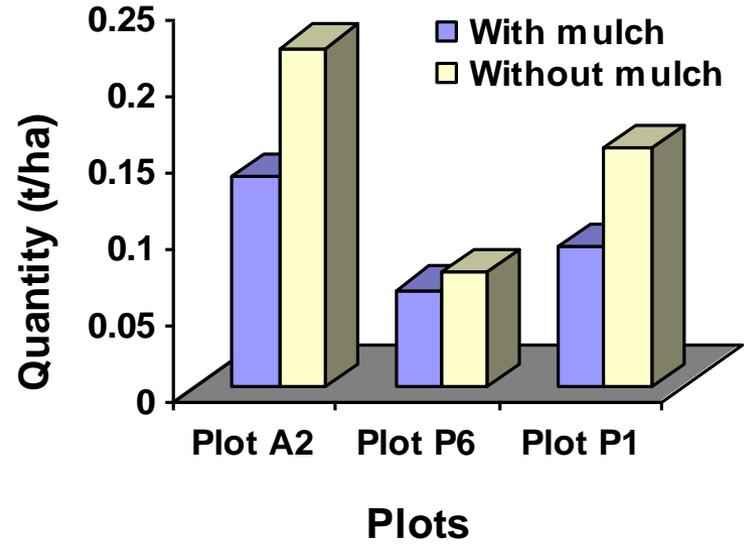
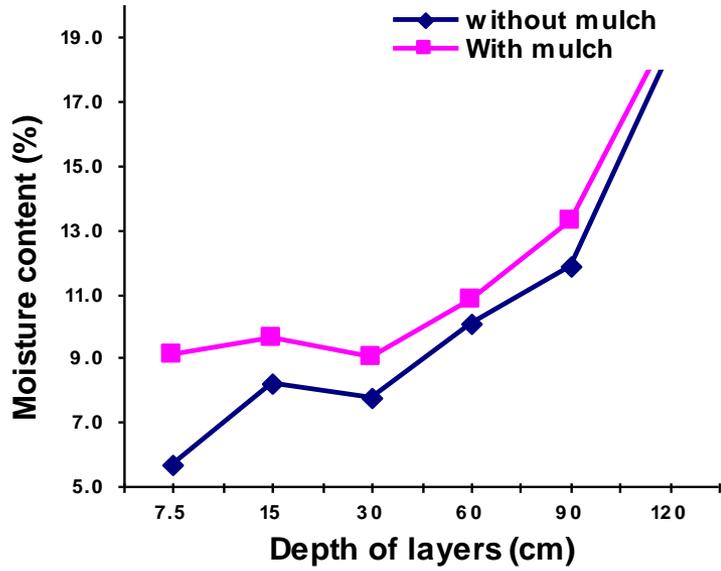
**NGT and Supreme & high
Courts**



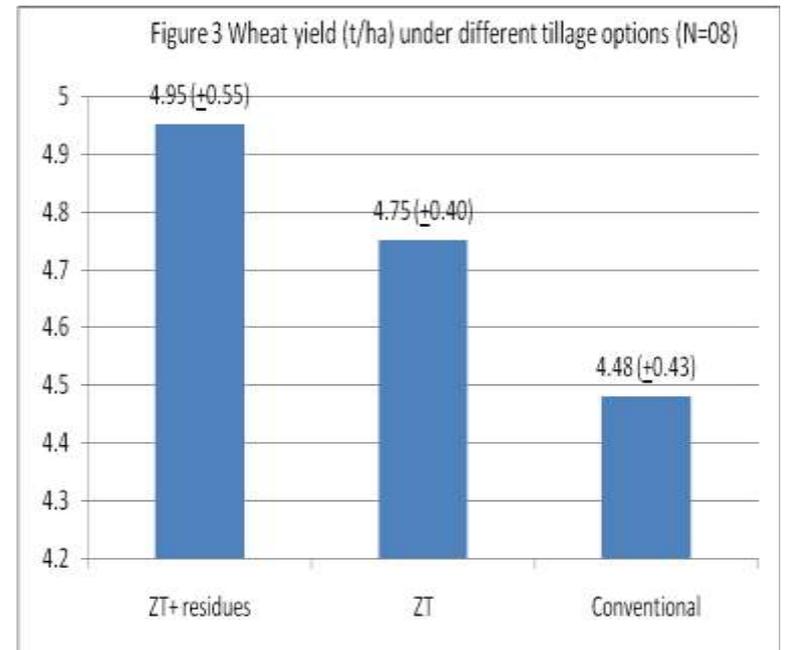
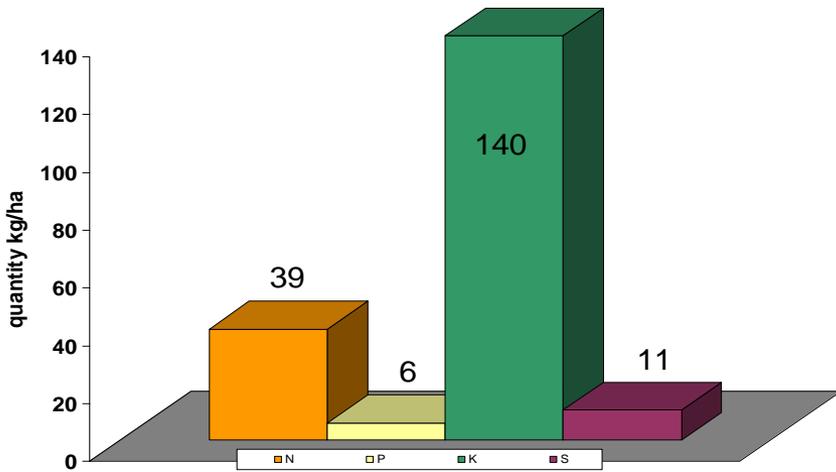


Super SMS





Weed matter after 90 days of sowing



Canopy temperature under various tillage option

Wheat Varieties	Canopy Temperature (°C)			
	Turbo Happy Seeder	Zero till	Conventional	Rotoseeder
DBW 17	30.1	30.6	31.8	32.8
PBW 550	29.5	30.7	31.7	33.9
HD 2894	31.5	32.5	32.9	33.2
Average	30.37	31.27	32.13	33.30
No. of observations	43	10	18	5

















Installing Tensio Meter in Water Management Spring Maize trial



Precision water management in Spring maize

Water mgt	Grain yield (kg/ha)		Irrigation water (m ³ /ha)		IWP (kg/m ³)	
	-R	+R	-R	+R	-R	+R
FP	10570	10640	6642	5806	1.59	1.83
F-45 kpa	10380	11210	5701	5127	1.82	2.19
F-60 kpa	10700	11630	5388	4448	1.99	2.61
AF-45 kpa	8770	11810	3985	3735	2.20	3.16
AF-60 kpa	8570	9950	3493	3027	2.45	3.29
D-45 kpa	9620	10520	2732	2410	3.52	4.37
D-60 kpa	9000	9290	2249	1981	4.00	4.69

Can we go Sub Surface ??

- Minimize Surface Evaporation & WUE
- Easy Mechanical operations
- Less Weeds, Effective fertigation
- Better NUE and Better Yield
- Possibility of Automation

But at What Depth ????









Way Forward

- Travelling Seminars
- Capacity building
- Local adaptation & local after sale & service
- Custom operators network
- Win Win for all and scale neutral Business Model
- Wide publicity
- A Sacred service to save environment, water, soil health and timely seeding with more net returns to save Farming

20000 USD to 10000 USD



Tractor Operated Combine Harvester

Conservation Agriculture

Agriculture of the Future

Future of the Agriculture

Thanks