

Rice Straw Management and Climate Change

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Review and planning meeting Workshop

28-29 March 2017



Project: Scalable straw management options for improved livelihoods, sustainability, and low environmental footprint in rice-based production systems

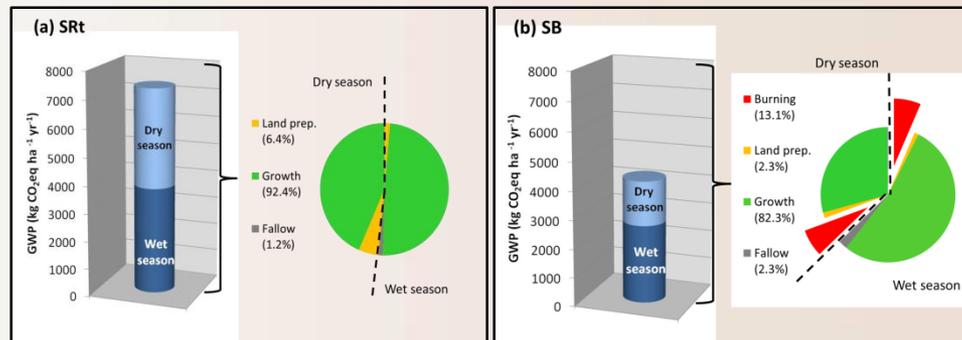
RICE STRAW MANAGEMENT AFFECTING THE ENVIRONMENT

- Various approaches in collection and utilization of rice straw residues were being implemented.
- Each practice has its own advantages and drawbacks on several factors including greenhouse gas emissions.
- An assessment of these management practices can be instrumental by providing data for emission inventories, life cycle analysis and carbon footprint analysis of rice.

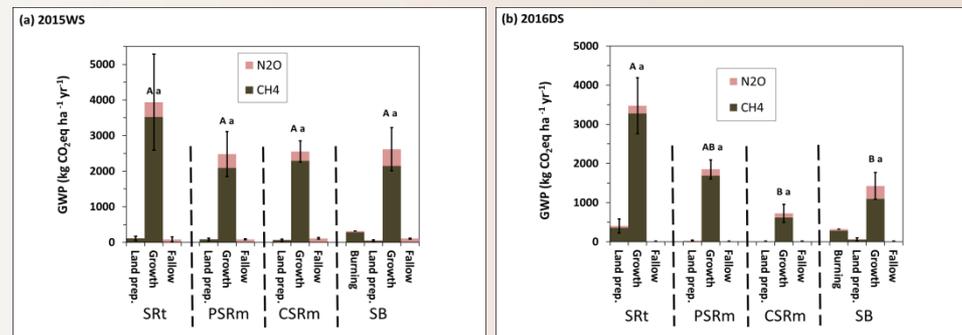


A. Rice Straw Burning and On-field Straw Management (Plot UC, IRRI | 2015WS & 2106DS)

- The total global warming potential (GWP) from straw burning (SB) was about 39% lower than with straw incorporation (SRT).
- Burning accounted for 13.1% of the annual GWP over the entire cropping cycle.



- Net GWP Rankings (2 seasons):
Straw Retained (SRT) > Straw Burning (SB) > Partial Straw Removal (PSRm) > Complete Straw Removal (CSRm)

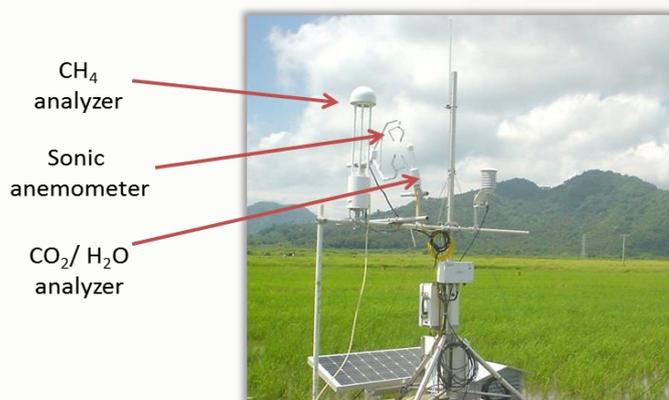


Romasanta, R.R., Sander, B.O., Gaihre, Y.K., Alberto, M.C.R., Gummert, M., Quilty, J., Nguyen, V.H., Castalone, A.G., Balingbing, C., Sandro, J., Correa, Jr., T., Wassmann, R., 2017. **How does burning of rice straw affect CH₄ and N₂O emissions? A comparative experiment of different on-field straw management practices.** Agriculture, Ecosystems and Environment. 239, 143-153.

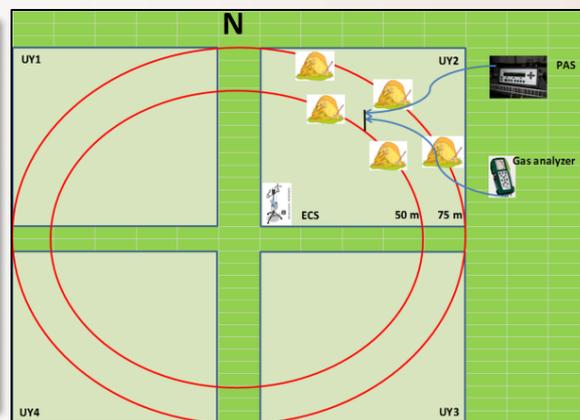


B. Pile Straw Burning Using EC Technique (Plot UY, IRRI | 2016 Dry Season Fallow Period)

- GHG emissions was measured using Eddy Covariance (EC) technique.
- The objective of this experiment was to assess the effects of burning straw in the field during fallow period on CH_4 fluxes (or the net exchanges of CH_4 across the land-atmosphere interface).



Eddy Covariance System (EC)



Field Layout (UY-IRRI)



Straw Pile



C. GHG Measurements on Late and Early Incorporation (500 Series, Lowland Farm, IRRI | 2016 WS -)

- Should we burn straw and incorporate right away after harvesting or leave the straw in the field and do the burning and incorporation just before land preparation?
- Which option has the lower GHG emission, higher energy efficiency and is more economical?
- This study wants to determine and assess the environmental and agronomic impacts of contrasting rice straw management practices.



Base of chamber



Top Chamber



Gas Sampling

