High-Level CSD Inter-sessional Meeting:

African Agriculture in the 21st Century:

Meeting the Challenges, Making a Sustainable Green Revolution

Windhoek, Namibia

February 9-10, 2009

Introduction to Session 1:
How to Operationalize a Green Revolution in Africa?

Session 1.1: Incorporating Sustainable Land Management and Agricultural Practices into More Successful African Agriculture

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In agronomic sciences, there has been frequent division between:

** Soil sciences*

** Crop sciences*

and sometimes

**Climate sciences*

This is a 'luxury' we can no longer afford, esp. with climate change

Parallel panels will need to achieve *convergence* and also need more *economics and other disciplines*

Is Green Revolution seen as an ends or as means?

Does 'operationalizing' the Green Revolution in Africa mean

* what we want to achieve or
* how we can best get there?

Implication has been that we need to re-make the Green Revolution as it was made in Asia

Should Green Revolution for Africa be more of the same?

More improved seeds?
More chemical fertilizer?
More application of water?

This strategy was not very successful in Africa in 'the first Green Revolution'
Why? Conditions in Africa are generally quite different from those in Asia

More crucial, the 21st Century will be different from the 20th Century

* Land and water per capita
* Cost of energy and inputs
* Climatic stresses growing
* Need to protect environment
* Must ensure access for poor

'More of the same' is not likely to help us achieve our objectives

Alternative view: We can achieve Green Revolution goals for Africa:

* without emphasis on new varieties, by tapping existing genetic potential;
* without much increase in fertilizer, by utilizing organic matter better;
* with less dependence on irrigation or rainfall -- by 'growing roots'

Critical role assigned to soil system and land management

Learning from SRI in Madagascar

Small farmers (ave. <1 ha) on some of 'poorest' soils that had yielded previously 2 tons/ha were able to average 8 tons/ha around Ranomafana Natl. Park

Same results from larger French-funded project for irrigation improvement on the high plateau; also seen in a study sponsored by French aid in 1996 (N=108)

Rice Yields on High Plateau in Madagascar, Antsirabe & Ambositra Regions,1994/95-1998/99

	Peasant Practice	SRA*	SRI
Area			
1994/95	1875.5	4361.9	34.5
1995/96	1501.5	5224.5	88.7
1996/97	1419.0	3296.7	226.7
1997/98	3122.0	2893.8	229.7
1998/99	2768.1	2628.0	542.8
Yield			
1994/95	2.02	3.96	8.62
1995/96	1.96	3.41	7.89
1996/97	2.08	3.30	10.68
1997/98	2.84	3.78	8.59
1998/99	2.97	4.61	8.07
Average	2.36	3.77	8.55

Robert Hirsch, *La Riziculture Malgache Revisitée: Diagnostic et Perspectives (1993-99)* Agence Française de Développement, Antananarivo (Janvier 2000), Annexes 13-14

Two Paradigms for Agriculture:

- GREEN REVOLUTION strategy was to:
  (a) Change the genetic potential of plants, and
  (b) Increase the use of external inputs -- more water, more fertilizer and insecticides

- SRI (AGROECOLOGY) changes instead the management of plants, soil, water & nutrients:
  (a) Promote the growth of root systems, and
  (b) Increase the abundance and diversity of soil organisms to better enlist their benefits

The goal is to produce better PHENOTYPES

MADAGASCAR: Rice field grown with SRI methods

CUBA: two plants of same variety (VN 2084) and same age (53 DAP)

Farmer in the Timbuku region, Mali, showing difference between regular and SRI rice plants, 2007

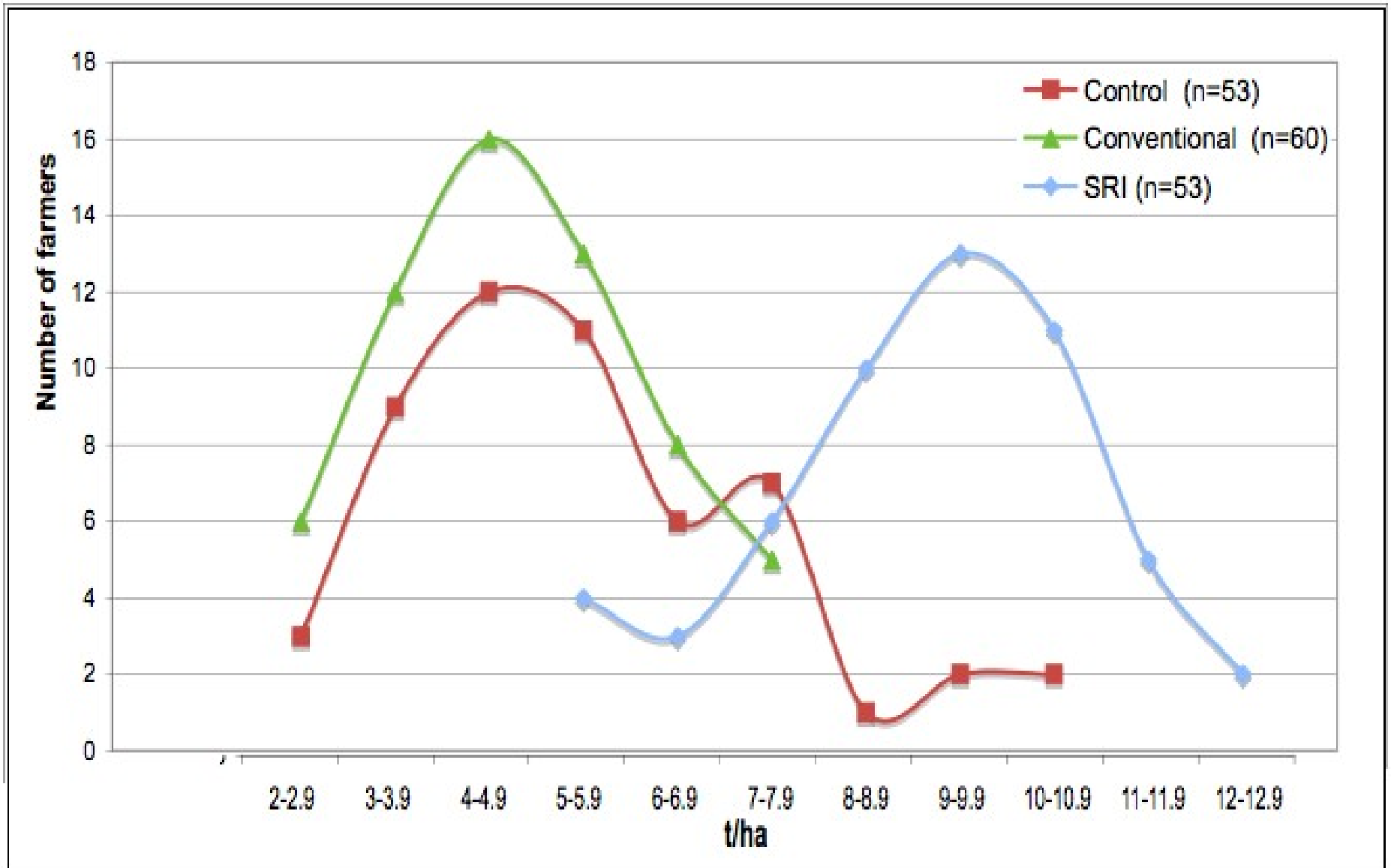
SRI yield 8.98 t/ha
Control yield 6.7 t/ha

Rice grain yield for SRI plots, control plots and farmer-practice plots, Goundam circle, Timbuktu region, Mali, 2008

	SRI	Control	Farmer Practice
Yield t/ha*	**9.1**	**5.49**	**4.86**
Standard Error (SE)	0.24	0.27	0.18
% Change compared to **Control**	+ 66	100	- 11
% Change compared to **Farmer Practice**	+ 87	+ 13	100
Number of Farmers	53	53	60

* adjusted to 14% grain moisture content

Yield distribution curves for SRI, control, and farmer-practice plots



Agroecological Strategy differs from Input-Dependent 'Green Revolution'

Management-oriented approach capitalizes upon (a) existing genetic potentials – also in other crops like wheat, finger millet, sugar cane… and (b) endogenous processes and potentials in soil systems – need to restore the 'life in the soil'

E-mail from Dr. Erika Styger, Africare/Mali (2/6/09):

- By the way, I just got a call this afternoon from one of our technicians, Haruna, in Goundam. He just trained a large number of farmers about composting in three villages. About 30 of them just showed up spontaneously when they heard he was installing some compost pits with some of the SRI farmers. Haruna was really excited telling me how much of a success it was, and how much farmers were interested in learning about how to compost.....
- He also mentioned that the wheat is performing very well. Direct seeded wheat performs best so far (better than transplanted), He already counted some 15-18 tillers. This is about 5 weeks after seeding. Farmers come by all the time and check out the plots. So people are excited... hope to get soon some photos.
- Haruna always says on the phone, 'I am really hopeful for the wheat SRI. It looks all really good, but for now I keep my silence... ‘

SRI concepts and methods being extended to **wheat** production in India

Pictures sent by Madhya Pradesh Rural Livelihoods Program operating in tribal communities in Mandla and Shahdol districts of Madhya Pradesh State, Central India

Finger Millet Intensification

(left); regular management of improved variety (center) and of traditional variety (right), India

Sugar cane grown with SRI methods (left) in Andhra Pradesh

Reported yields of **125-235 t/ha** compared with usual 65 t/ha

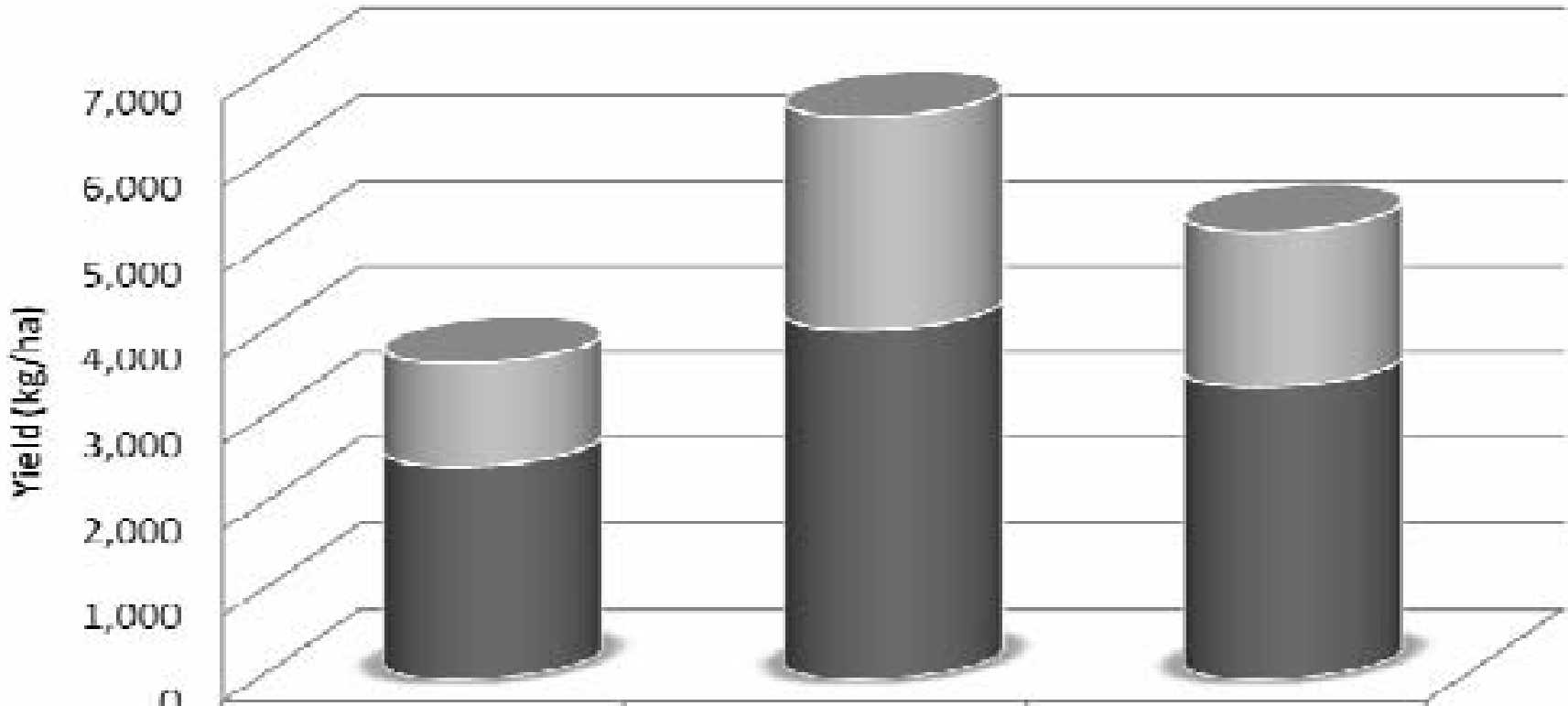
IMPACT OF COMPOST USE ON CROP YIELDS IN TIGRAY, ETHIOPIA

Sue Edwards, Arefayne Asmelash, Hailu Araya and Tewolde Berhan Gebre Egziabher

Food and Agriculture Organization of the United Nations

Rome, Italy, December 2007

Average grain and straw yields (kg/ha) for 7 cereal crops, based on the averages for each crop, Tigray, 2000-2006
(s=observations for straw yield; g=observations for grain yield)



	No input (s=393/g=327)	Compost (s=263/g=290)	Chemical fertilizer (s=202/g=222)
Grain	1,200	2,473	1,812
Straw	2,477	4,073	3,404

Changes in Management Practices can contribute to:

- Higher yields
- Higher factor productivity
- Lower costs of production
- Higher household income
- Environmental quality, and
- Better prospect for agricultural sustainability

Agroecological Strategies

- Not a solution to all of Africa's agricultural development needs
- Still 'a work in progress' (CA) – based on science and experience
- Offer many opportunities to meet food security and income needs in a sustainable manner

Proposition: We can increase agricultural productivity

By incorporating sustainable land management and agricultural practices into farming systems

Not an either/or proposition but a matter of combining optimizing management of our plants, soil, water and nutrients (agroecology)