

# System of Rice Intensification performance in Iraq during 2008

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In this season, we concentrated on three SRI activities: (A) the application of SRI in Al-Muthanna province; (B) improvement of mechanical rice transplanting; and (C) using clover crop as a green manure in Najaf and Muthanna provinces.

## **A. SRI in Al-Muthanna Province**

One Japanese donor has supported our SRI work in Al-Muthanna province via the International Organization of Migration (IOM) and the Iraq Community Action Program (ICAP) of the Cooperative Housing Foundation (CHF). The donor saw our SRI activities via the SRI web site and decided to support SRI system in Iraq, focusing on the application of SRI in Al-Muthanna province.



Raising of Iraq and Japan flags in the lecture hall

Our plan is to spread SRI concepts among of rice farmers in two ways: first, by SRI lectures, and second, by SRI applications. 1,600 rice farmers (men) and 400 rice farmers (women) were trained into four locations (Rumatha, Warkaa, Majd and Najmi districts) for more widespread benefit. Together, Khidhir and Flayeh delivered all the lectures on SRI, spending 16 days in this program.





Khidhir and Flayeh delivering lectures on SRI in Al-Muttanah province

Lectures alone are not enough for SRI understanding, so we elaborated on the lectures by establishing SRI field demonstrations at different 16 sites, with 1/4 ha per site. We also organized 12 field visitations to SRI fields at different crop growth phases. More than 1,200 rice farmers attended those visitations.



Rice-growing farmers visiting SRI fields

Farmers were trained on how to produce organic manure from their farm materials three month before date of sowing.



Producing organic manure on-farm by farmers

The fields were prepared and nurseries were established, with boxes for seedlings sown and transferred to the nursery. Transplanting in the field was done with proper

spacing, using ropes to ensure regular distances between rows (25 cm) and plants within rows (15 cm). Young seedlings 17 days old were used, one seedling per hill; using half the usual amount of chemical fertilizer (160 kg/ha); with manual weed control between rows; and intermittent irrigation in the vegetative phase. At maturity, samples were taken, and the results are shown in the tables below.



Transplanting operations with regular spacing

Table 1: Results of SRI farmer's fields and non-SRI in Rumatha district

Farmer name	Culture method	Plant height (cm)	Panicle length (cm)	Spikelets per panicle	Sterility (%)	Panicle number/m <sup>2</sup>	Yield (t/ha)
Abdul Ameer A. Mhawis	SRI	100	24.5	204.8	5	357	8,800
	Non-SRI	80	23	141.4	11.5	264	3,800
Nadhun M. Hamdan	SRI	90	23	148	10.5	363	8,120
	Non-SRI	75	20	102.2	14	266	3,090
Kadum M. Shahaib	SRI	85	22	148.2	7	334	6,600
	Non-SRI	70	18	72.4	20	270	4,540
Ali H. Sultan	SRI	75	20	106	20	302	5,000
	Non-SRI	75	18	80.4	20	251	3,100
Average	SRI	88	22.5	157	10.6	339	7,130
	Non-SRI	75	20	99	16.6	263	3,632

Table 2: Results of SRI farmer's fields and non-SRI in Warkaa district

Farmer name	Culture method	Plant height (cm)	Panicle length (cm)	Spikelets per panicle	Sterility (%)	Panicle number/m <sup>2</sup>	Yield (t/ha)
Ghmos K. Kumani	SRI	90	23	132.3	13	355	8,615
	Non-SRI	80	20	110.2	15	314	5,140
Mizher Ch. Kaddosh	SRI	95	22	149.8	8	320	7,765
	Non-SRI	80	19	101.1	17	300	4,770
Murad Ch. Kaddosh	SRI	95	23	148.9	10	285	6,030
	Non-SRI	85	20	88.4	17	235	4,970
Anwar F. Kassar	SRI	95	23	136.5	12	300	6,620
	Non-SRI	80	18	95	15.5	299	5,030
Average	SRI	94	23	142	11	315	7,257
	Non-SRI	81	19	96	16	287	4,977

Table 3: Results of SRI farmer's fields and non-SRI in Majd district

Farmer name	Culture method	Plant height (cm)	Panicle length (cm)	Spikelets per panicle	Sterility (%)	Panicle number/m <sup>2</sup>	Yield (t/ha)
Habbeb Sh. Shaalan	SRI	85	21	150	3.7	330	6,590
	Non-SRI	80	18	123	9.7	244	5,020
Alwan D. Shayal	SRI	85	20	130	5.7	324	8,220
	Non-SRI	75	19	110	11.2	290	5,900
Jaber M. Noor	SRI	90	21	140.7	6.2	318	7,420
	Non-SRI	80	20	121	6.1	310	4,770
Haitham N. Kamil	SRI	85	20	102.5	5	275	6,080
	Non-SRI	80	17	85.5	11.5	297	4,800
Average	SRI	86	20.5	130	5.2	312	7,077
	Non-SRI	79	18.5	110	9.6	285	5,122

Table 4: Results of SRI farmer's fields and non-SRI in Najmi district

Farmer name	Culture method	Plant height (cm)	Panicle length (cm)	Spikelets per panicle	Sterility (%)	Panicle number/m <sup>2</sup>	Yield (t/ha)
Raheem A. Sheltagh	SRI	85	21	122.4	7	355	7,050
	Non-SRI	75	19	100.2	15	308	4,050
Azawi N. Abed	SRI	90	24	140.4	13.9	303	6,450
	Non-SRI	85	21	111.2	18	275	4,300
Najeh F. Karim	SRI	95	24	143.1	7.3	267	7,000
	Non-SRI	90	20	102.4	3.7	404	6,090
Hussein S. Hmadi	SRI	95	23	162.5	13.6	404	6,270
	Non-SRI	85	23	160.7	12.3	284	5,290
Average	SRI	91	23	142.1	10.5	332	6,692
	Non-SRI	84	21	118.6	12	318	4,932

The results in the tables above indicated that the SRI grains yield increased for all SRI fields, but with different rates, from 17% to 130% compared with traditional practices for the same variety used. The overall average was 7,034 t/ha with SRI methods vs. 4,666 t/ha with farmers' usual methods, a difference of 72.2%.

Panicle length was increased by 2 cm on average between SRI panicles compared with non-SRI panicles. Spikelets were increased by 35% in SRI panicles, while the sterility rate was reduced by about one-third, from 13.6% to 9.3%. Plant height was raised 10 cm on average compared with non-SRI plants because of the use of organic matter and intermittent irrigation with SRI fields.

The farmer Abdul Ameer A. Mhawis in Rumatha district had the highest yield among the SRI demonstration fields in that area, reaching a production of 8,800 kg/ha (2,200 kg/donum), an increase of 130% compared with his non-SRI yield using the same Jasmine variety. His field had the highest fertility because of sowing clover crop instead of wheat beforehand (Table 1).



The farmer Ghmos K. Kumani in Warkaa district had the highest yield there, achieving 8,165 kg/ha (2,153kg/donum), an increase of 70% compared with his non-SRI yield with the same Jasmine variety (Table 2).

The farmer Alwan D. Shayal in Majd district had the highest yield among the other SRI demonstration fields in that district, reaching 8,220 kg/ha (2,055 kg/donum) with an increase of 41% compared with non-SRI production of the same Jasmine variety (Table 3).

The farmer Raheem A. Sheltagh in Najmi district had the highest yield among SRI demonstration fields in that district, reaching 7,050 kg/ha (1,762 kg/donum) with an increase rate of 36% compared with non-SRI practice using the same Jasmine variety (Table 4).



Seedling box nursery



Intermittent irrigation used in vegetative phase ▲



High yield with SRI plant



## **B. Mechanical transplanting with wide spacing**

The State Board of Agricultural Extension and Cooperation undertook to spread the use of transplanting rice by machine adapting SRI practices to such cultivation in cooperation with the State Board of Agricultural Research. Because of water shortage in rice season 2008, only 5 sites in two provinces (Najaf and Diwaniya) were managed, with each site comprising of 1/2 ha. The Agricultural Extension and Training Center in Najaf province was established field day in Al-Abbasiya sub-district. Yield was increased from 13% at lowest to 27% at highest (see table below).

Province	Farmer name	Area	Productivity (kg/ha)		Increase (%)
			Mech. TP	Conv.	
Diwaniya	Abbas Abed Al-Zahraa	1/2 ha	6,400	5,600	13
	Dhurgham R. Swadi	1/2 ha	7,200	5,600	23
Najaf	Jabbar H. Almhanna	1/2 ha	7,100	5,200	27
	Adnan A. Zebil	1/2 ha	7,000	5,200	26
	Abed Kareem Alzahairi	1/2 ha	6,900	5,200	25
Total	5	2.5 ha	6,920	5,360	28.5



◀ One mechanically-transplanted field

### **C. Clover crop as a green manure**

The Iraqi soil is in need of restored fertility, whether by applying organic matter or by planting legumes as a green manure. For farmers, planting clover as a crop is common practice for feeding their animals. They then sow their rice crop, but don't seem to know how to produce organic matter from this crop for the soil. In this SRI project we taught them to produce organic matter from their farm residues or from their clover crop as a green manure. 40 sites in Najaf and Al-Muthanna provinces were chosen for demonstrations and evaluations (see table below).

Province	Site	Farmer number	Area (ha)
Al-Muthanna	Rumatha	10	2.5
	Warkaa	10	2.5
	Majd	10	2.5
Al-Najaf	Mishkhab	5	1.25
	Abbasiya	5	1.25
Total		40	10

In April, the clover crop was ploughed into the soil before its flowering phase, then the field was supplied with water and 20 kg/ha of Urea to promote decomposition, and every 10 days, the field was supplied with water again. In June, the field was ploughed again to prepare the land for rice sowing, followed by intermittent irrigation during the crop's vegetative phase. The increase of rice productivity using clover as a green manure compared with traditional methods is shown in the table below.

Increase of productivity with clover crop green manure				Total
Less than 10%	10 – 19%	20 – 29%	30 – 39%	
2	25	11	2	40 farmers

Planting clover crop before rice ►  
 crop as a green manure for restoring  
 soil fertility



**D. Development of SRI system over four years**

I joined the SRI community of practice in 2005 after learning about SRI in 2004 and trying out the methods. In 2005, 2006 and 2007 we undertook SRI evaluations without any outside support, just with research station resources. In 2008, we started getting support from CHF and IOM to apply SRI methods in Al-Muthanna province.

The SRI work was done in difficult conditions, not like in other countries. Many times we faced dangerous days due to violent actions at that time. Oftentimes due to the ongoing conflict, the main roads for travel were closed. But we resolved to continue. The table and figures below show the SRI development in Iraq during past four years.

Year	Area (ha)	Farmers (number)	SRI demonstration fields	SRI trials	SRI comparison fields
2005	0.25	1	1	-	-
2006	2	8	8	1	-
2007	11	16	16	5	2
2008	16	60	60	2	-
Total	29.25	85	85	8	2

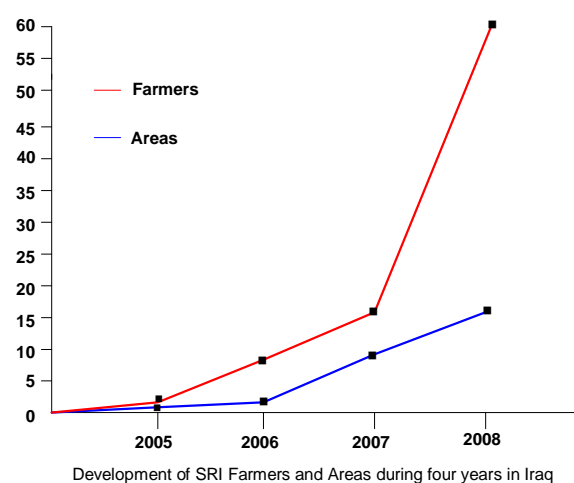
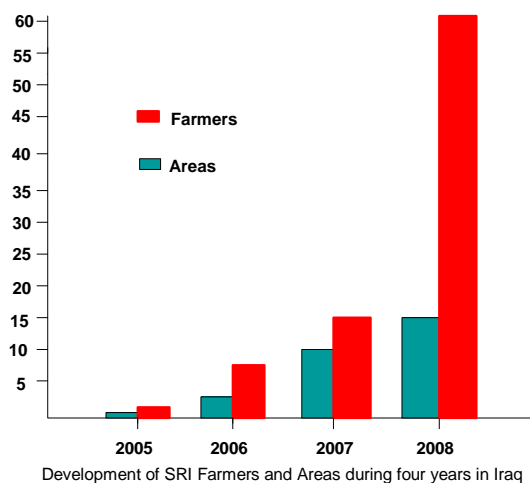


Figure 1: Development of SRI areas and farmers in Iraq, 2005-2008

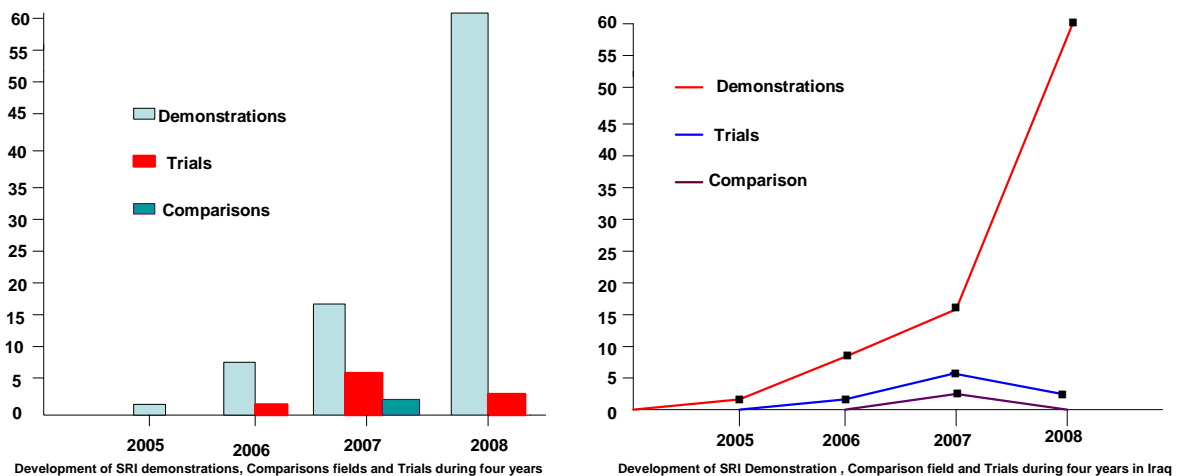


Figure 2: SRI demonstrations, comparison fields and trials in Iraq, 2005-2008

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