

Urea Deep Placement Technology and its Extension to Farmers in Myanmar

Htoo Htoo Aung and Extension Team

Grahame Hunter, Upendra Singh, Joaquin Sanabria

**Fertilizer Sector Improvement Project, Yangon, Myanmar
International Fertilizer Development Center (IFDC)**

Myanmar Soil Fertility and Fertilizer Management Conference

18-19 October 2017

DAR Auditorium, Yezin, Nay Pyi Taw



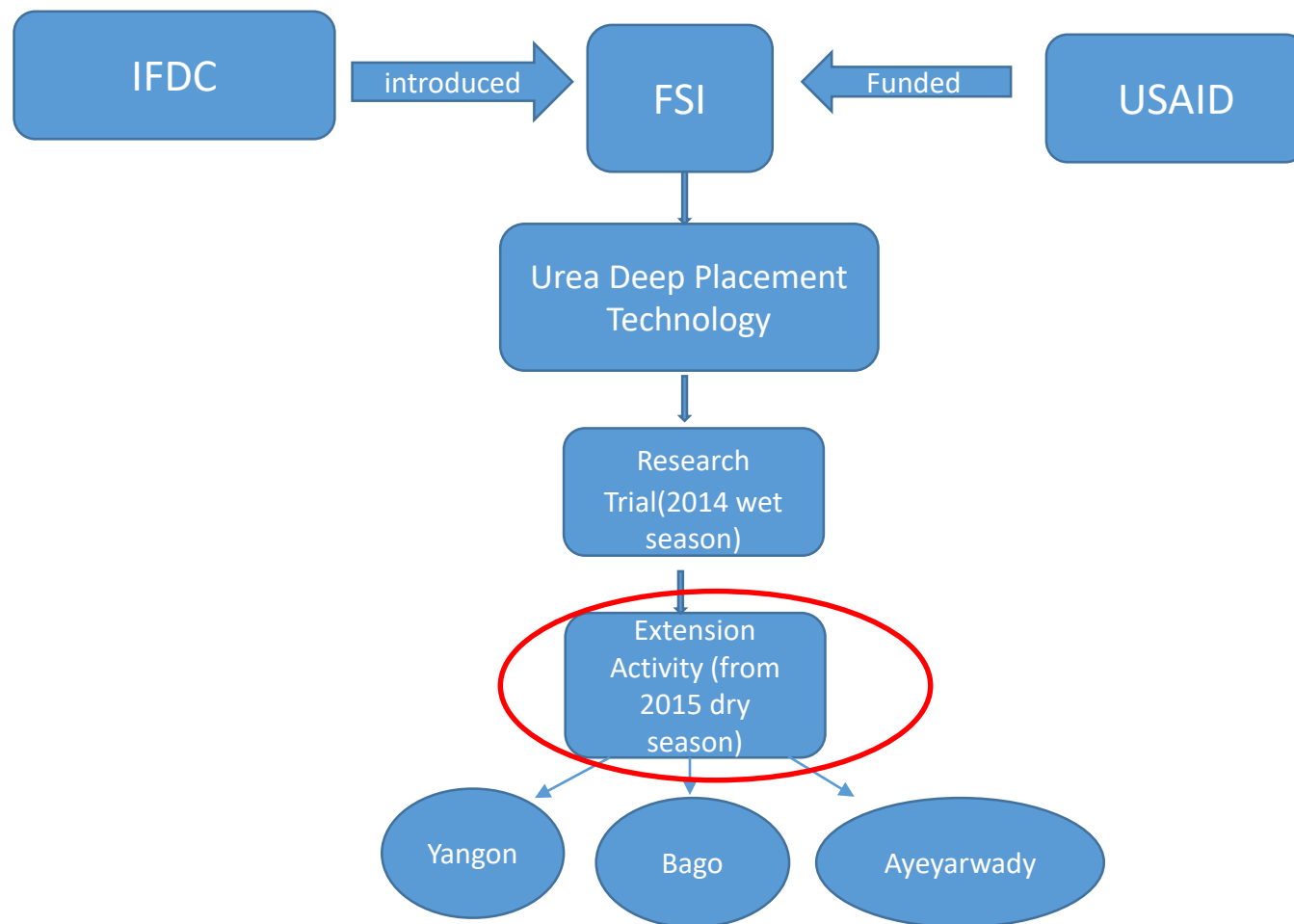
USAID
FROM THE AMERICAN PEOPLE



Australian Government
Australian Centre for
International Agricultural Research



Outline



Introduction: UDP

Agronomic Benefits:

- Onetime application provides enough nitrogen
- Reduces weed infestation, reduces the cost of weeding
- Increases yield
- Straw with higher quality animal food

Environment Benefits:

- Reduces greenhouse gases entering the atmosphere
- Less leaching of nitrogen compounds into the ground water
- Less runoff of nitrogen compounds into water ways

Materials and Methods

1. Field Demonstration
2. Farmer Trainings
3. Motivational Field Trips
4. Field Days
5. Crop Cuts

FSI Collaborating Partners

Names	Acronyms	Status
Welt Hunger Hilfe	WHH	INGO
Golden Plain	GP	NGO
Myanmar Heart and Development Organization	MHDO	NGO
Nine Network	NN	NGO
Village Integrated and Development Association	VIDA	NGO
Group of Development Research and Index	GDRI	NGO
Green Land	GL	NGO
Technical Alliance for Farmers	TAF	NGO
Karuna Myanmar Social Service	KMSS	NGO

Field Demonstration

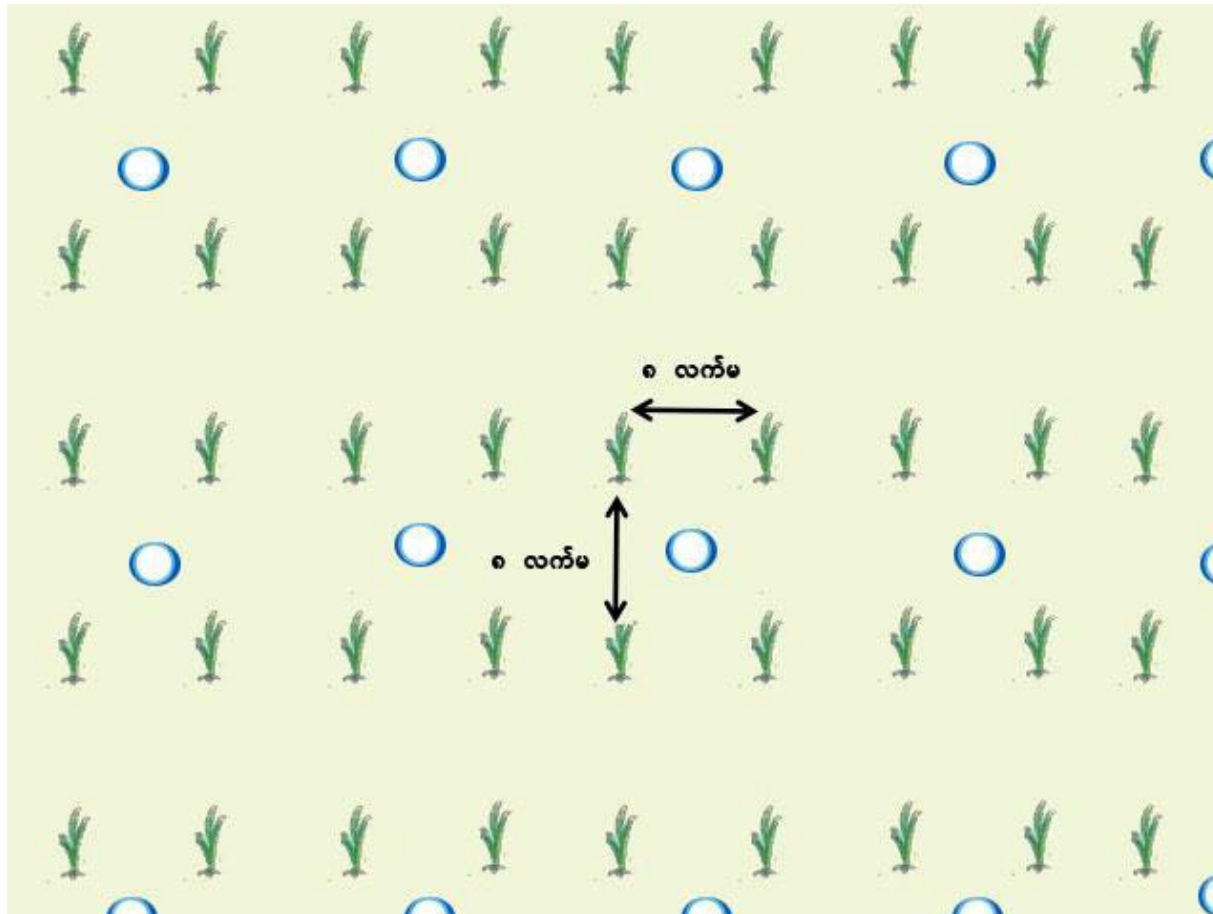
Transplanted rice-UDP	Broadcast seeded rice-UDP	Farmer Practice
<p>Basal fertilizer: T-super, Potash, Gypsum</p> <ul style="list-style-type: none"> • Transplant 25 days old seedlings • 2-3 seedlings per hill • plant spacing of 20 cm x 20 cm • UDP was done by hand at 7 days after transplanting • One briquette was deep placed at the middle of every alternate 4 rice hills at 7-10 cm depth (Figure 1) 	<p>Basal fertilizer: T-super, Potash, Gypsum</p> <ul style="list-style-type: none"> • Seed rate : 80 kg/ha (wet season), 100 kg/ha (dry season) • UDP was done by hand at 20-25 days after broadcasting • One briquette was deep placed at a depth of 7-10 cm , 16 inches different between each briquette 	<ul style="list-style-type: none"> • Followed local farmer practice sowing type • Fertilizer applying type

(Wet season) Briquette size is 1.8 g and rate is 109 kg urea/ha (44 kg/acre)

(Dry season) Briquette size is 2.7 g and rate is 164 kg/ha (66 kg/acre)

Plot size for sub plot: 10 m x 20m (200 square meter)

Figure 1. Schematic diagram for placement of urea briquette



Results: Demonstration Plots, 2015 Dry Season

Analysis of Variance for 2015 Dry Season

Effect	Num DF	Den DF	F Value	Pr>F
Fertilizer Treatment	2	15.43	4.65	0.026(significant)
Variety	2	5.783	0.25	0.790
Fertilizer*Variety	4	15.43	1.95	0.153

Treatment Comparison of rice grain yield for 2015 dry season

Treatment	Mean (t/ha)	
Transplanted with UDP	5.42	A
Broadcast-seeded with UDP	4.34	B
Broadcast-seeded with FP	4.04	B

* Least square means with the same letters are not significant at $p < 0.05$.

Results: Demonstration Plots, 2015 Wet Season

Analysis of variance for 2015 Wet season

Effect	Num DF	Den DF	F Value	Pr>F
Fertilizer Treatment	3	31.16	13.44	<.0001
Variety	5	17.8	1.32	0.2987
Fertilizer*Variety	14	30.75	2.00	0.0529

LS means comparison of rice grain yield with different fertilizer treatments and varieties

Treatment Comparison	Mean Treatment Differences in Yield for a given variety (Pr >t)							
	Hmawbi - 2	Manaw Thu Kha	Sin Kha	Thu	Sin Latt	Thwe	Thee Htat Yin	Yadanar Toe
Broadcast: UDP vs FP	0.087	ns	0.049		0.028		-	0.02
Broadcast UDP vs Transplant UDP	0.01 (-)	0.02 (-)	0.0003 (-)		0.017 (-)		ns	0.02 (-)
Transplant: UDP vs FP	ns	ns	0.007		0.007		0.017	ns

Results: Demonstration Plot, 2016 Dry Season

Analysis of variance

Effect	Num DF	Den DF	F Value	Pr>F
Fertilizer Trt	2	42.85	9.36	0.0004
Variety	3	19.96	1.67	0.2065
Fertilizer*Variety	6	42.85	1.71	0.1422

Comparison of rice grain

TRT	Mean	
Transplanted with UDP	5.509	A
Broadcast-seeded with UDP	5.216	A
Broadcast-seeded with FP	4.345	B

Least square means with the same letters are not significant at $p < 0.05$.

Results: Demonstration Plot, 2016 Wet Season

Effect of fertilizer treatment on rice grain yield

LS-means with the same letter are not significantly different.		
TRT	Mean	
Transplanted with UDP	5.004	A
Broadcast-seeded with UDP	4.310	B
Broadcast-seeded with FP	3.792	C

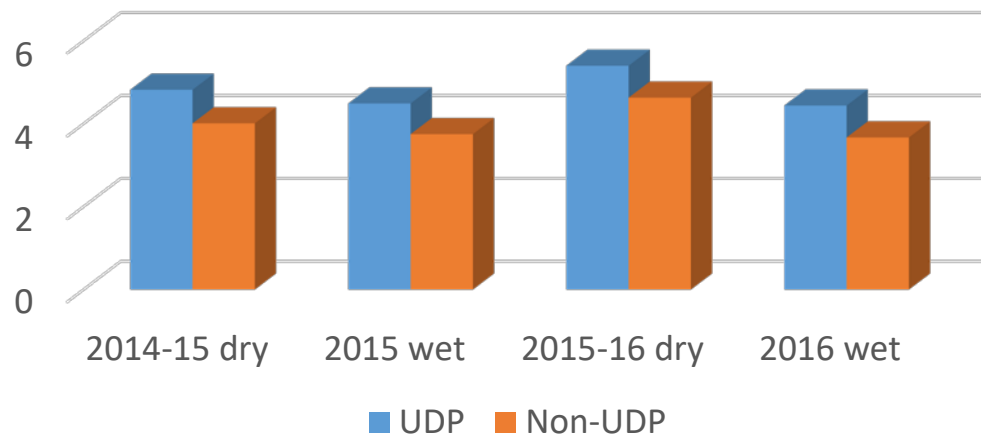
Least square means with the same letters are not significant at $p < 0.05$.

Crop Cut Results

Comparison of rice crop-cut yield from four seasons for UDP versus non-UDP fields.

Season	Quantity of crop cut	Average Yield of UDP (t/ha)	Average Yield of non-UDP (t/ha)	Different yield (UDP > non-UDP) t/ha	Different yield (UDP>non-UDP) Basket/acre	Significant (p < 0.01)
2015 dry	94	4.82	4.01	0.81	15.68	**
2015 wet	113	4.49	3.75	0.74	14.33	**
2016 dry	137	5.40	4.63	0.77	14.91	**
2016 wet	121	4.44	3.67	0.77	14.91	**

Rice grain Yield (t/ha) based on crop cut for UDP versus non-UDP fields



Discussion

- Farmers became strong advocates of the technology
- Learned in field test, motivational field trips and field days
- Shared the information to other farmers
- FSI has found innovators and early adopters
- Adoption has been slow
- Labor intensive technology
- Lack of labor is a major constraint for UDP adoption
- A mechanized applicator will have a big impact on adoption

Conclusions

- Strong network between BMO, retailers and farmers
- Availability of urea briquette in retailer shops
- Easy transportation
- Use and utilization by farmers depend on labor issue
- Import effective applicators
- Encourage to Grant Partners (Strength contribution in multiplying the diffusion rate)
- Cooperate with DOA extension activity (Help and assistances)
- Maintain intensity on the message of balanced fertilizer with UDP

Thank You very Much For Your Attention

