

CURRENT SITUATION, TREND AND OUTLOOK FOR N USE EFFICIENCY IN INDIA

Satish Chander
Director General
The Fertiliser Association of India
New Delhi

N USE EFFICIENCY – BROAD CONCEPTS

- Agronomic efficiency – Kg grain per kg N applied
- Apparent recovery – Per cent age of nitrogen recovered by crop
- Economic efficiency – Increase in profit per unit of investment in N

TRENDS IN NITROGEN CONSUMPTION IN INDIA

Year	Consumption of Nitrogen (N)	
	Quantity in ('000 tonnes)	Kg/ hectare
1960-61	211.7	1.4
1970-71	1479.3	8.9
1980-81	3678.1	21.3
1990-91	7997.2	43.1
2000-01	10920.2	58.9
2007-08	14419.1	73.6
2008-09	15090.5	77.1
2009-10	15580.0	79.1

INTER-ZONE VARIATION IN NITROGEN USE – 2009-10

Zone	N use per hectare (Kg)
East	65.7
North	126.7
South	93.4
West	54.2
All-India	79.1

N USE EFFICIENCY – CURRENT SITUATION

> 4 Rs for efficient use:

- Right type of fertiliser
- Right dose
- Right time of application
- Right method of application

METHOD OF APPLICATION

Split application – most popular

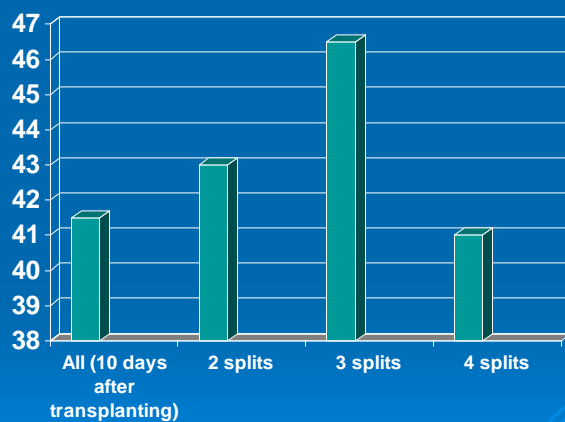
Wheat

Basal N (Kg.)	N at CRI (Kg.)	Grain yield (Kg/ha)	% recovery of added N
60	40	4960	45.01
50	50	5120	48.22
40	60	5510	52.17

CRI =Crown root initiation

Source: 'Fertiliser Management in Food Crops', Singh and Tandon

EFFECT OF SPLIT APPLICATION ON RICE YIELD (Quintal / ha)

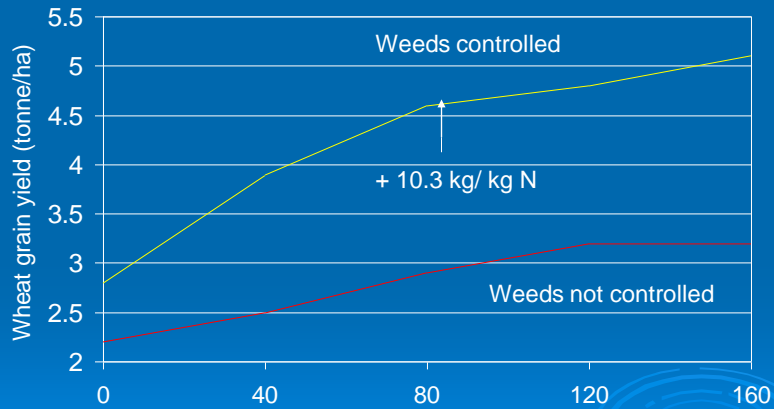


INTERACTION EFFECT OF WATER AND NITROGEN

Crop	Mean yield (Quintal / ha)	
	At 0 N	At recommended dose of N
Rice (Kharif un-irrigated)	24	36
Rice (Kharif irrigated)	30	37
Rice (Rabi irrigated)	32	41
Wheat (Rabi un-irrigated)	8	13
Wheat (Rabi irrigated)	15	25

Source: Randhawa N.S. and Tandon HLS (1982), Fertiliser News, February, 1982

IMPACT OF WEED CONTROL ON N USE EFFICIENCY



Singh et al 1984, Indian J .Agronomy

IMPACT OF BALANCED FERTILISATION ON CROP YIELD

Crop group	Control (kg/ ha)	% increase		
		N	NP	NPK
Cereals	1803	46.8	74.3	96.3
Oilseeds	897	30.7	83.4	87.6
Pulses	586	33.4	99.2	117.0

Source: Prasad, R, Indian J Fert 3(1) 53-62 (2007)

MEAN YIELD OF RICE AS INFLUENCED BY PRILLED UREA VS. UREA SUPER GRANULE AT 60 KG N/ HA (1981-85 – Kharif)

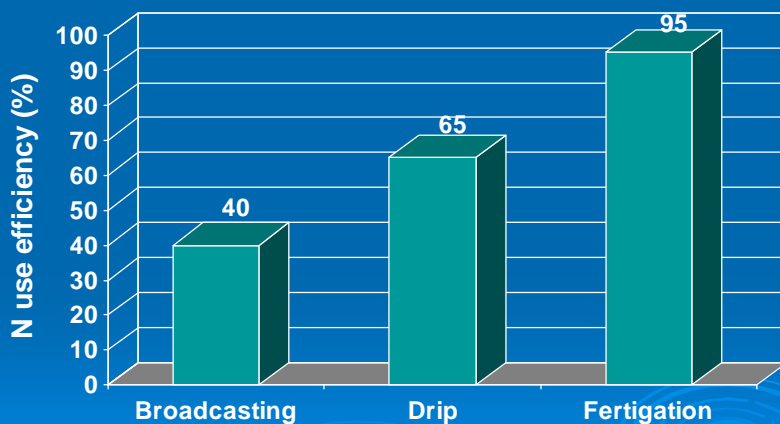
State	Grain yield, Kg/ha			Advantage of USG over prilled urea KG paddy/ha	%
	Trials averaged	Urea splits	USG placement		
Andhra Pradesh	34	3921	4193	272	7.0
Karnataka	38	4791	5459	668	14.0
Orissa	12	4095	5327	1232	30.1
Punjab	98	6144	6502	358	5.9
Uttar Pradesh	123	4271	4846	575	13.5
West Bengal	27	4979	5536	557	11.2

Source: Kumar & Kaore 1989, Soil Fertility and Fertiliser Use, Vol. III, IFFCO.

TREND AND OUTLOOK

- **Neem coated Urea**
(About 220 thousand tonnes of neem coated urea is manufactured and sold in India)
- **Drip fertigation**
- **New/ Innovative products**
 - Customised fertilisers
 - Fortified fertilisers
 - Speciality fertilisers (water soluble fertilisers)

NITROGEN USE EFFICIENCY UNDER DIFFERENT METHODS OF WATER APPLICATION



Source: Role of Water Management In Improving Agriculture Productivity, T. B. S. Rajput, IARI, IJF, April, 2010

CONCLUSION

- Nitrogen deficiency is widespread across the country
- Nitrogen use in India has grown significantly and its demand will increase progressively in future
- Through various proven techniques, use efficiency could be increased (split application, interaction of water and N use, foliar spray, USG, fertigation, weed control, etc.)
- New/ innovative products
- NBS on P & K fertilisers has been introduced w.e.f 1st April, 2010
- Urgent need for Urea to be brought under NBS