

**Participatory INM  
Technology Development at  
Dumka**

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# Objective :

**To build up farmers' awareness  
towards Balanced Fertilization  
and Integrated Nutrient  
Management .**

# **Title of the Experiment I :**

## **INM in Maize**

- Field trials were conducted on Maize (Suwan Composite-1) taking four treatments under two farming situations:
  1. Timely sown Maize under rainfed upland situation with previous crop Mustard.
  2. Timely sown Maize under rainfed medium land situation with previous crop Potato.

**Table 1. Agro-economic performance of the tested technologies in Maize**

Treatments	Mean grain yield (q/ha)	B:C ratio
T <sub>1</sub> - Fertilizers as per FP*	18.6	-
T <sub>2</sub> - NPK(RD)**	27.8	5.18 : 1
T <sub>3</sub> - 50%NP + 100%K + BIOF <sup>^</sup>	25.1	7.85 : 1
T <sub>4</sub> - 100%NPK + BIOF <sup>^</sup>	30.5	5.56 : 1

\*FP= Farmers Practice; \*\*RD= Recommended Dose; <sup>^</sup>BIOF= Biofertilizers (Azotobacter+PSM) ; FYM @ 6t/ha was common for T<sub>2</sub>, T<sub>3</sub> & T<sub>4</sub>.

# Inference:

1. There was 49.5% yield increase with NPK(RD) over FP.
2. 64.0% yield increase with (100%NPK+BIOF) over FP , 9.7% over NPK(RD) and 21.5% increase over (50%NP+100%K+BIOF).
3. This 21.5% less yield with (50%NP+100%K+BIOF) clearly accounted for 50% deduction in NP, but gave the highest B:C ratio(7.85 : 1).

# **Title of the Experiment II : Balanced Fertilization in Pigeon Pea**

**Field trials were conducted on Pigeon Pea (Birsa Arhar-1) taking four treatments under one farming situation:**

- 1. Timely sown Pigeon Pea under rainfed upland situation with previous crop Fallow.**

**Table 2. Agro-economic performance of the tested technologies in Pigeon Pea**

Treatments	Mean grain yield (q/ha)	B:C ratio
T <sub>1</sub> - Fertilizers as per FP	7.7	--
T <sub>2</sub> - NPK(RD) + L*	12.1	8.64 : 1
T <sub>3</sub> - NPK(RD) + L + S <sub>45</sub> (S-through SSP)	14.2	13.74 : 1
T <sub>4</sub> - NPK(RD)+L+S <sub>45</sub> +B@ 2kg/ha	15.2	11.12 : 1

\*L= Lime applied @ 4.0 q/ha.



***BALANCED FERTILIZATION IN  
PIGEON PEA***



***BALANCED FERTILIZATION IN  
PIGEON PEA***

# Inference contd...

1. There was 57.1% yield increase with NPK(RD)+L], 84.4% with [NPK(RD)+L+S<sub>45</sub>] and 97.4% with [NPK(RD)+L+S<sub>45</sub>+ B @ 2kg/ha] over FP.
2. 17.3% more yield was obtained by replacing DAP with SSP which accounted for 45kg S/ha in addition to meeting the recommended P- requirement.
3. Addition of 2kg B/ha to [NPK(RD)+L+S<sub>45</sub>] accounted for 7.0% extra yield(T<sub>3</sub> vs T<sub>4</sub>), which may become indispensable particularly when there is intensive problem of flower dropping.
4. The highest B:C ratio(13.74: 1) was obtained with [NPK(RD)+L+S<sub>45</sub>].

# **Title of the Experiment III :**

## **Balanced Fertilization in Mustard**

- Field trials were conducted on Mustard (B-9) taking three treatments under two farming situations:
  1. Timely sown Mustard under irrigated upland situation with previous crop Maize.
  2. Late sown Mustard under irrigated medium land situation with previous crop Rice.

**Table 3. Agro-economic performance of the tested technologies in Mustard**

Treatments	Mean grain yield (q/ha)	B:C ratio
T <sub>1</sub> - Fertilizers as per FP	7.2	-
T <sub>2</sub> - NPK(RD)(P- as DAP)	11.0	10.50 : 1
T <sub>3</sub> - NPK(RD) (P- as SSP)*	13.0	15.60 : 1
* Corresponds to 30kg S/ha		



***BALANCED FERTILIZATION IN  
MUSTARD***



***BALANCED FERTILIZATION IN  
MUSTARD***

# Inference contd...

1. There was 52.8% yield increase with NPK(RD) (P-as DAP) and 80.5% increase with NPK(RD) (P- as SSP) over FP.
2. 18.2% more yield was obtained by substituting DAP with SSP which provided 30kg S/ha in addition to meeting recommended P- requirement of the crop.
3. Use of SSP instead of DAP enhanced B: C ratio from (10.50: 1) to (15.60: 1).

# **Title of the Experiment IV :**

## **INM in Potato**

**Field trials were conducted on Potato (Kufri Ashoka) taking four treatments under two farming situations:**

- 1. Timely sown Potato under irrigated upland situation with previous crop Maize.**
- 2. Late sown Potato under irrigated medium land situation with previous crop Rice.**

**Table 4. Agro-economic performance of the tested technologies in Potato**

Treatments	Mean tuber yield (t/ha)	B:C ratio
T <sub>1</sub> - Fertilizers as per FP	12.3	-
T <sub>2</sub> - NPK(RD)	22.0	7.21 : 1
T <sub>3</sub> - 50%NP + 100%K + BIOF	19.9	6.74 : 1
T <sub>4</sub> - 50%NPK + BIOF + SOT*	19.0	8.10 : 1

\*SOT= Soaking of tubers in (0.5%Urea + 1.5%SSP) solution for 2 hours;  
 Soaking of tubers in (Metalaxyl+ Carbendazime) solution was common for all;  
 FYM @ 6t/ha was common for T<sub>2</sub>, T<sub>3</sub>, & T<sub>4</sub>.



***INM IN POTATO***



***INM IN POTATO --- BIOFERTILIZER TREATED PLANTS***



***INM IN POTATO --- BIOFERTILIZER UNTREATED PLANTS***

# **Inference** contd...

- 1. 78.9% yield increase with NPK(RD), 61.8% increase with [50%NP + 100%K + BIOF] and 54.5% increase with [ 50%NP + 100%K + SOT ] over FP.**
- 2. Although 15.8% less yield was obtained with [50%NP + 100%K + SOT] w.r.t. NPK(RD), the former(i.e., T<sub>4</sub>) gave the highest B:C ratio(8.10: 1).**

# **Title of the Experiment V :** **INM in Wheat**

Field trials were conducted on Wheat (LOK-1) taking four treatments under two farming situations:

1. Timely sown Wheat under irrigated upland situation with previous crop Maize.
2. Late sown Wheat under irrigated medium land situation with previous crop Rice.

**Table 5. Agro-economic performance of the tested technologies in Wheat**

Treatments	Mean grain yield (q/ha)	B:C ratio
T <sub>1</sub> - Fertilizers as per FP	19.0	-
T <sub>2</sub> - NPK(RD)	32.7	8.85: 1
T <sub>3</sub> - 50%NP + 100%K + BIOF	29.5	11.23 : 1
T <sub>4</sub> - 100%NPK + BIOF	37.5	8.77 : 1

**FYM @ 6t/ha was common for T<sub>2</sub>, T<sub>3</sub> & T<sub>4</sub>.**



***INM IN WHEAT***



***INM IN WHEAT***

# **Inference** contd...

- 1. There was 72.1% yield increase with NPK(RD), 55.3% increase with [50%NP + 100%K + BIOF] and 97.4% increase with [100%NPK + BIOF] over FP.**
- 2. 14.7% yield increase with [100%NPK + BIOF] over NPK(RD) accounted for the positive effect of BIOF, although both the treatments were economically at par.**
- 3. 27.1% yield increase with [100%NPK + BIOF] over [50%NP + 100%K + BIOF] indicated the direct effect of 50% deduction in NP- fertilizers, but the latter corresponded to the highest B:C ratio(11.23: 1).**



**Thank You**