

## Use of Human urine in Agriculture

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### Objectives of Investigation

1. To study the effect of application of human urine on growth and yield of crops and economics of cultivation
2. To develop protocol on frequency and quantity of application of human urine for selected crops (Radish, French bean, Maize and banana).

### Nutrient composition of ALW

pH	5.6-7.5
Nitrogen (%)	0.26-1.2
Phosphorus (%)	0.14-0.16
Potassium (%)	0.14-0.18
Ca meq/l	8.5-9.5
Ca+Mg meq/l	3.6-3.8
Na meq/l	149.5-150.6

Funded by Arghyam & KVN Trust-Bangalore

### Field experiment

Test crop-Maize

Conducted- Nagasandra village, Doddaballapura Taluk, Bangalore

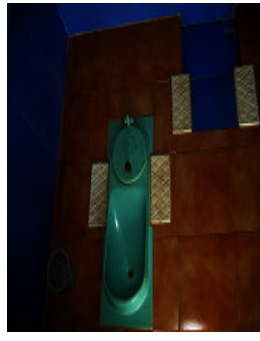
Farmers name- Prasana

Human urine collected- specially designed toilet (Ecosan) Swami Vivekanada school, Doddaballapura

## Ecosan toilet-Human urine collection



**Gents**



**Girls**



**Collecting in cans**

## Field experiment

The store room on the farm used to store ALW collected from school in Doddaballapura.



Methods to avoid loss of nutrients

- To avoid nitrogen loss- Sulphuric acid was added as additive
- Chlorination - To inactivate microorganisms.
- Ozonization -Alternate method
- Storage in cool room /shade place

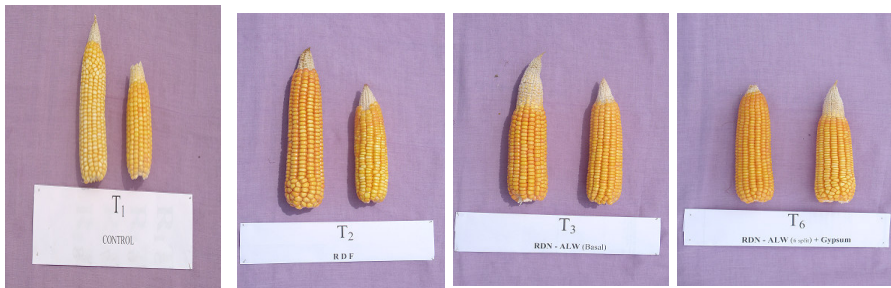
**Application of Human urine (Before sowing the maize seeds)**



**Application of Human urine**



**Sowing**



**Treatmental difference**

### Studies on the effect of ALW on maize grain yield(q/ha)

Treatment	Grain yield(q/ha)
Control	39.9
Chemical fertilizer	79.5
Human urine	<b>80.5</b>



### Birds eye view of the maize experiment



## Experiment on Banana

Location- Nagasandra, Farmer name- Prakash

- ❖ Fertilizer Recommendation – 400:240:500 kg NPK /ha
- ❖ ALW-3768 liters/120 plants.
- ❖ 153846.15 liters.



General view of the experimental plot before treatment imposition



Two month old banana crop

**Seventh month old banana plant**



**Control plot**



**Human urine applied plot**

**Research in progress**

**Pot culture studies after biosand filtration**

**Identification of microorganisms through PCR technique**

## HURDLES

- Collection ,Transportation and application to fields.
- Social Taboo-Marketing of produce.

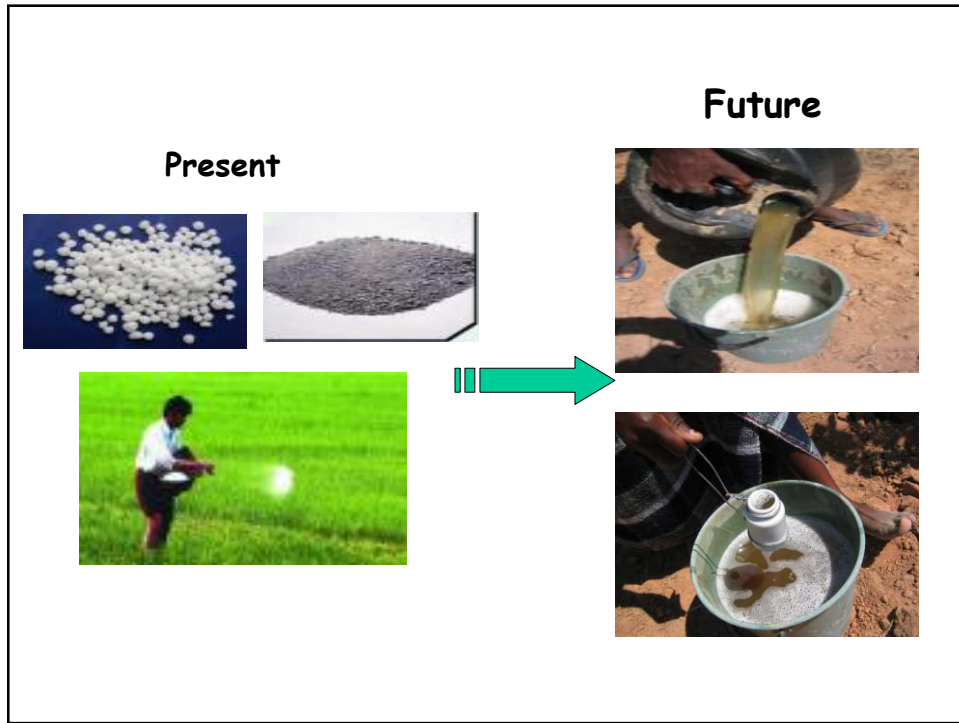
### **Alternatives**

- ❖ Creating awareness among people.
- ❖ Conversion of urine to dry powder.
- ❖ Application through drip irrigation

## Other potential uses

- Extraction of phosphorus –the most limiting nutrient.
- Extraction of the enzyme urokinase
- **Research need**
- Long term impact of urine on soil properties.
- Impact on soil /ground water pollution.





**Acknowledgment to**

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