

# Comparative Nitrogen Use Efficiency of Urea, Manure and Different Mulch Types in Horticulture in Semi-arid Bolivia

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Onion (*Allium cepa*) is an important horticultural crop in Bolivia -

Hypothesised advantages of mulch vs equivalent N application:

- Improves growth and yield
- Releases nutrients more in synchrony with the crop
- Suppresses weeds
- Increases soil moisture
- Reduces soil erosion
- Effect depends on shade level

Would you like to see where and how the experiment was set up? Scan the code!



## Methods

Onions planted January 19

- 7 treatments (table 1)
- 4 replications, shade and competition from tree boundary as blocking factor; RCBD

Evaluated parameters:

- Plant height
- Circumference
- # newly produced leaves
- # green leaves
- Weeds (FW)
- Onion yield
- % of harvested (surviving) onions

## Results

At 12 weeks after planting:

- Urea 1 and 2: tallest onions (graph 1)
- No difference between control and farm yard manure in any parameters
- *Melinis repens*: more leaves produced and green leaves compared to other mulch treatments
- Summary of comparisons in table 1

Weed at 8 weeks after planting:

- Urea 1: most weed biomass (9.1 t FW/ha)

## Results

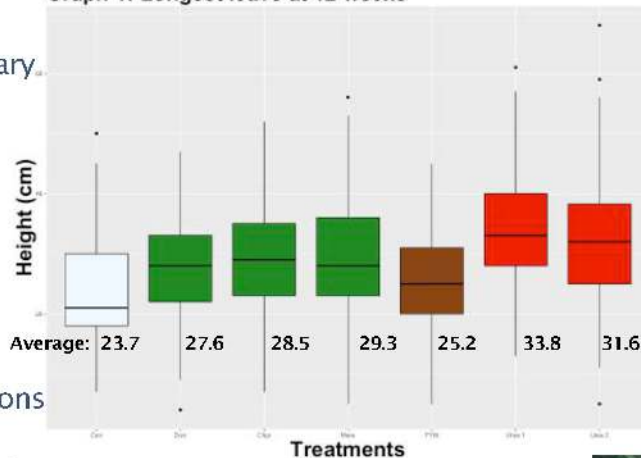
At harvest:

- Urea 1 highest yield (6.3 t FW/ha), significantly different to all, but *Melinis repens* treatment
- Urea 2: lowest % of onions harvested (68%), significantly different to all, but to the control and *Dodonaea viscosa*

## Conclusion

- Urea application (80 kg N<sub>equi</sub>/ha) seems to work well
- Rethink manure application
- Effects on soil humidity and temperature not assessed → done next year
- There seems to be potential for *Melinis repens*

Graph 1: Longest leave at 12 weeks



## Acknowledgement

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Table 1: Comparisons of treatments

(treatments with the same letters are not significantly different)

Treatment	N <sub>equi</sub> (kg/ha)	Plant height	Circumference	Leaves prod	Leaves green	Weeds
Control	0	a	a	a	a	a
<i>Dodonaea viscosa</i>	45	b	a,b	a,b	a,b	a,b
<i>Chamaecytus proliferus</i>	40	b,c	c	a,b	a,b,c	a,b,c
<i>Melinis repens</i>	25	b,c,d	b	c	d	a,b,c,d
Farm yard manure	~150	a	a	a,b	a,b,c	a,b,c,d,e
Urea 1 (46% N)	80	e	d	c	d,e	a,b,c,d,e
Urea 2 (46% N)	40	d,e	c,d	d	b,c,e	a,b,c,d,e

