

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

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Onion (*Allium cepa*) important in Bolivia - Mulch vs eqv N might:

- Improve growth & yield
- Release nutrients in synchrony with crop growth
- Suppress weeds
- Increase soil moisture
- Reduce soil erosion
- Yet effects might depend on shade

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



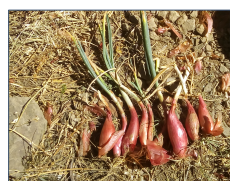
Methods

Onions planted January 2019

- 7 treatments (table 1)
- 4 reps, distance from tree boundary as blocking factor
- RCBD

Parameters:

- Plant height (ht)
- Circumference at base (circ)
- # new leaves (#lf_{new})
- # green leaves (#lf_{gr})
- Fresh wt Weeds (Weed)
- Onion yield (Y)
- % survival (%s)



Results

8 weeks after planting (WAP), urea₁ had most weed biomass

12 WAP, urea treatments had tallest onions (Fig. 1)

12 WAP, no sig. diff. between control & farm yard manure for any parameter

Melinis repens had more total & green leaves than other mulch treatments (Table 1)

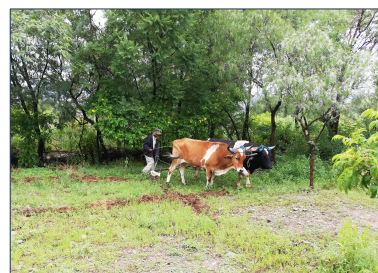
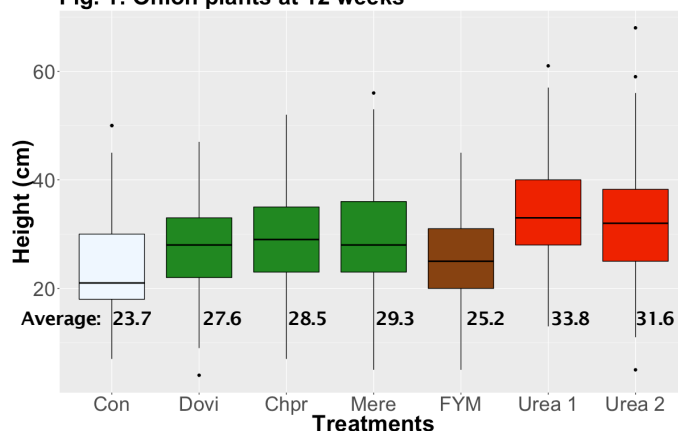
At harvest:

- Urea 1 had highest yield (6.3 Mg FW/ha), sig. higher than all others except *Melinis repens* treatment
- Urea 2: lowest % of onions harvested (68%), sig. lower than all others except control & *Dodonaea viscosa*

Conclusions

- Urea @ 80 kg N_{eqv}/ha worked well
- Manure not recommended at current rate
- Soil H₂O % & temperature not assessed; to be done in 2020
- *Melinis repens* best performing mulch

Fig. 1: Onion plants at 12 weeks



Acknowledgement

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Table 1: Experimental treatments: those with same letters in same column are not sig. diff.

Treatment	N _{eqv} (kg/ha)	ht	circ	#lf _{new}	#lf _{gr}	Weed
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	
Urea 2 (46% N)	40	d,e	c,d	d	b,c,e	a,b,c,d,e

