Evaluation of the evaporative cooling system (zero energy cool chamber) for sweetpotato roots storage

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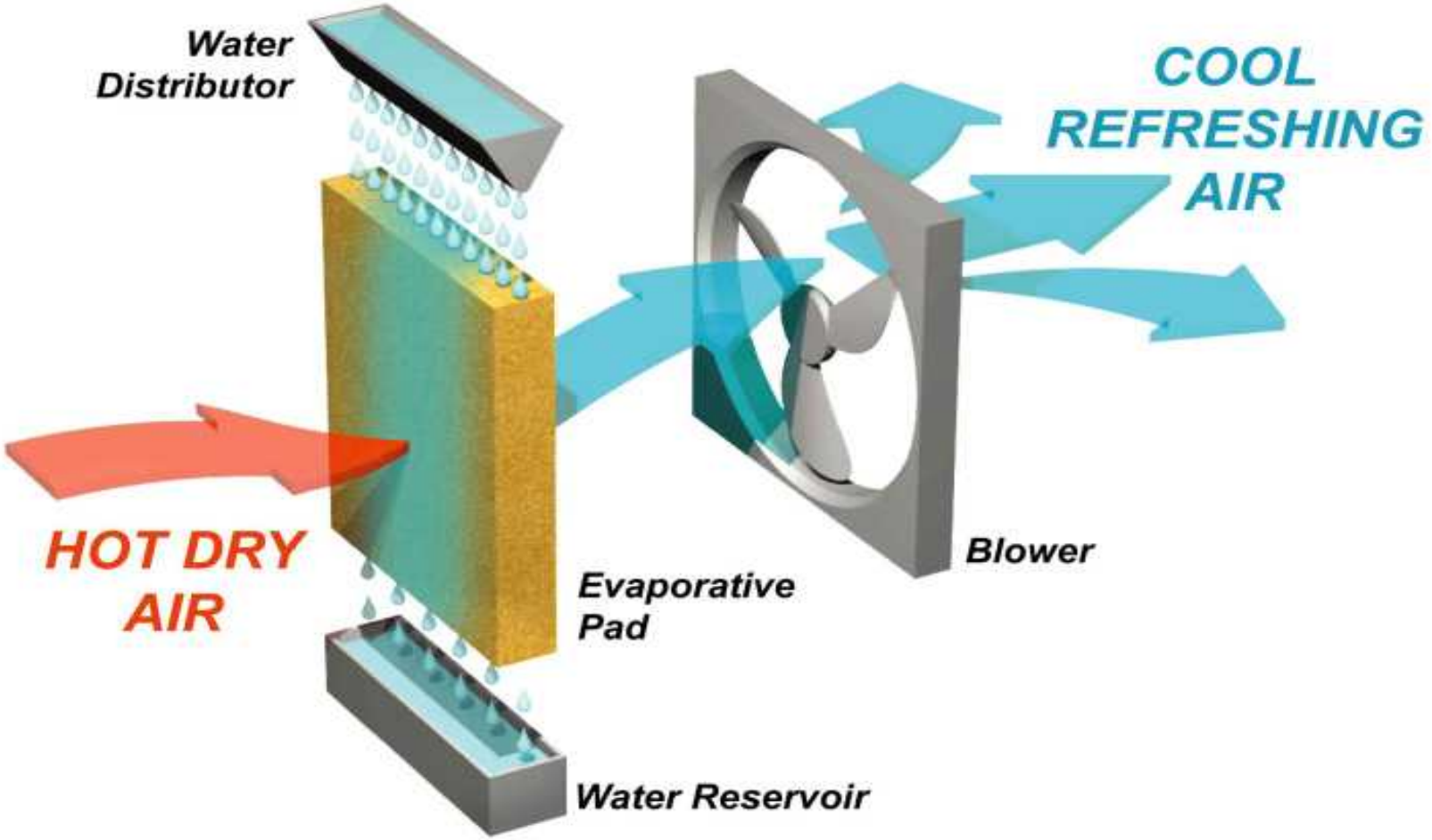
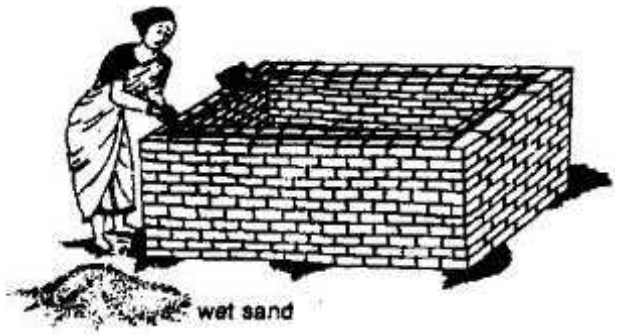
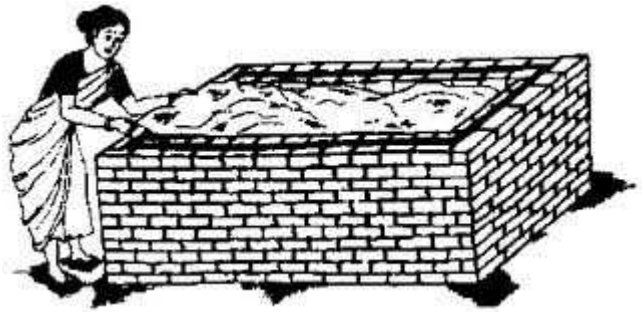
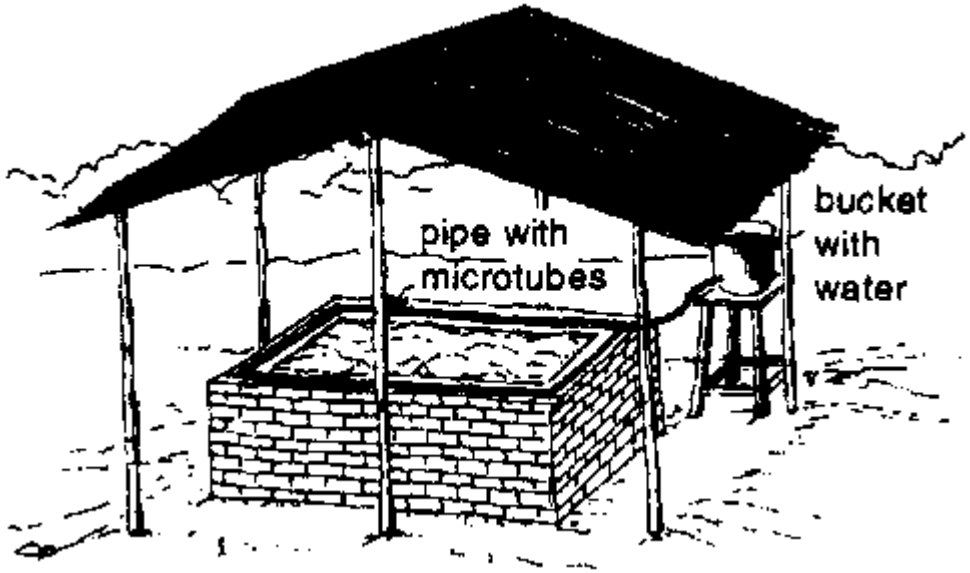
How **EVAPORATIVE COOLING** works



https://muellerdesignlab.wordpress.com/2012/04/20/diy-evaporative-cooler-design/


wet sand




pipe with
microtubes
bucket
with
water

Storage of fruits and vegetables in ZECC

Crop	Month	Cool Chamber		Room Temperature	
		Days	Weight loss %	Days	Weight loss %
Mango	June-July	9	5.04	6	14.90
Banana	Oct-Nov	20	2.50	14	4.80
Sapota	Nov-Dec	14	9.46	10	20.87
Lime	Jan-Feb	25	6.00	11	25.00
Kinow	Dec-Feb	60	15.30	14	16.10
Potato	Mar-May	90	7.67	46	19.08
Tomato	April-May	15	4.42	7	18.62
Amaranth	May-June	3	10.98	1	49.80
Methi	Feb-March	10	10.80	3	18.00
Parwal	May-June	5	3.89	2	32.36
Okra	May-July	6	5.00	1	14.00
Carrot	Feb-March	12	9.00	5	29.00

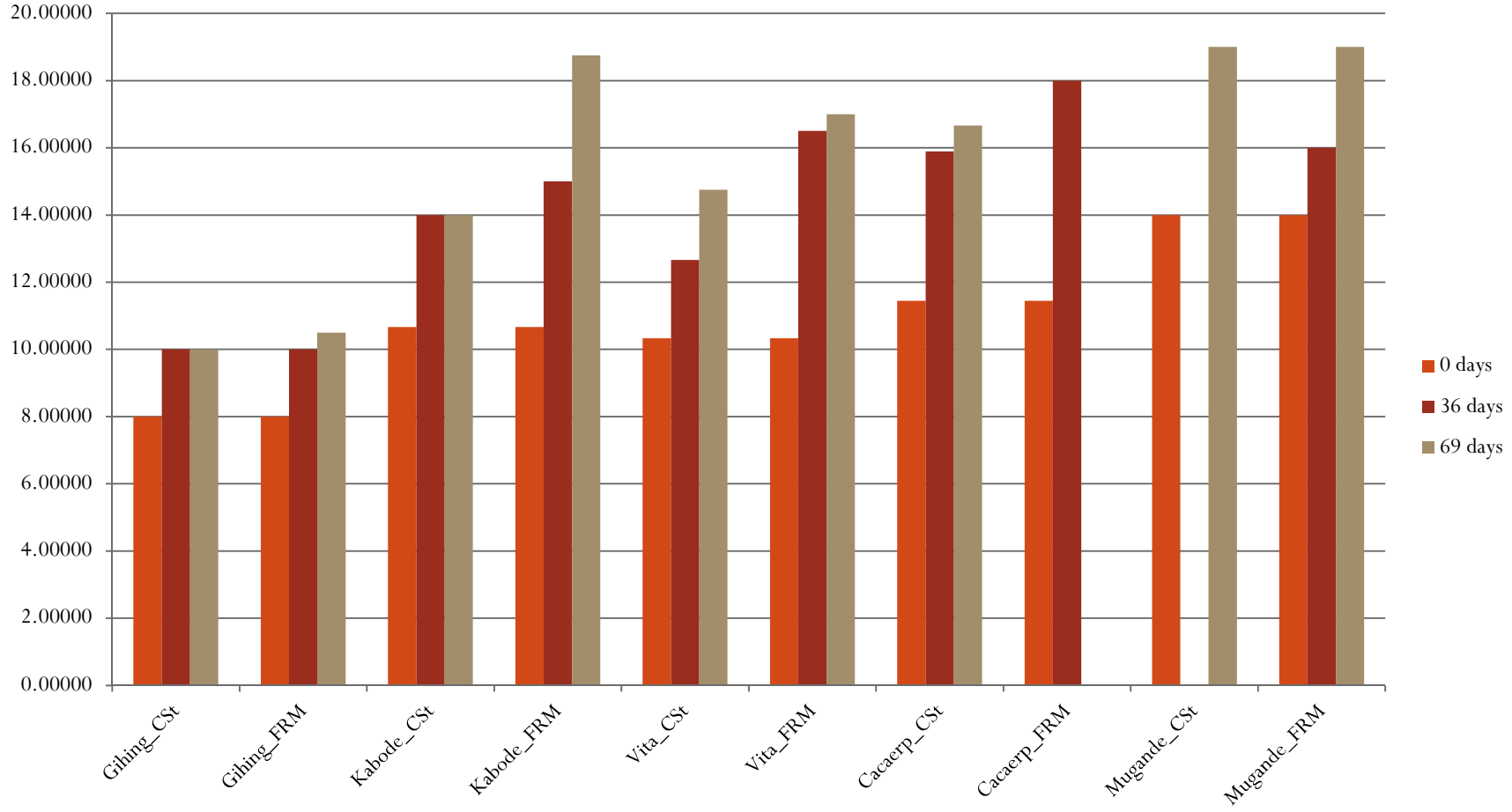
Materials and Methods

Sweetpotato varieties

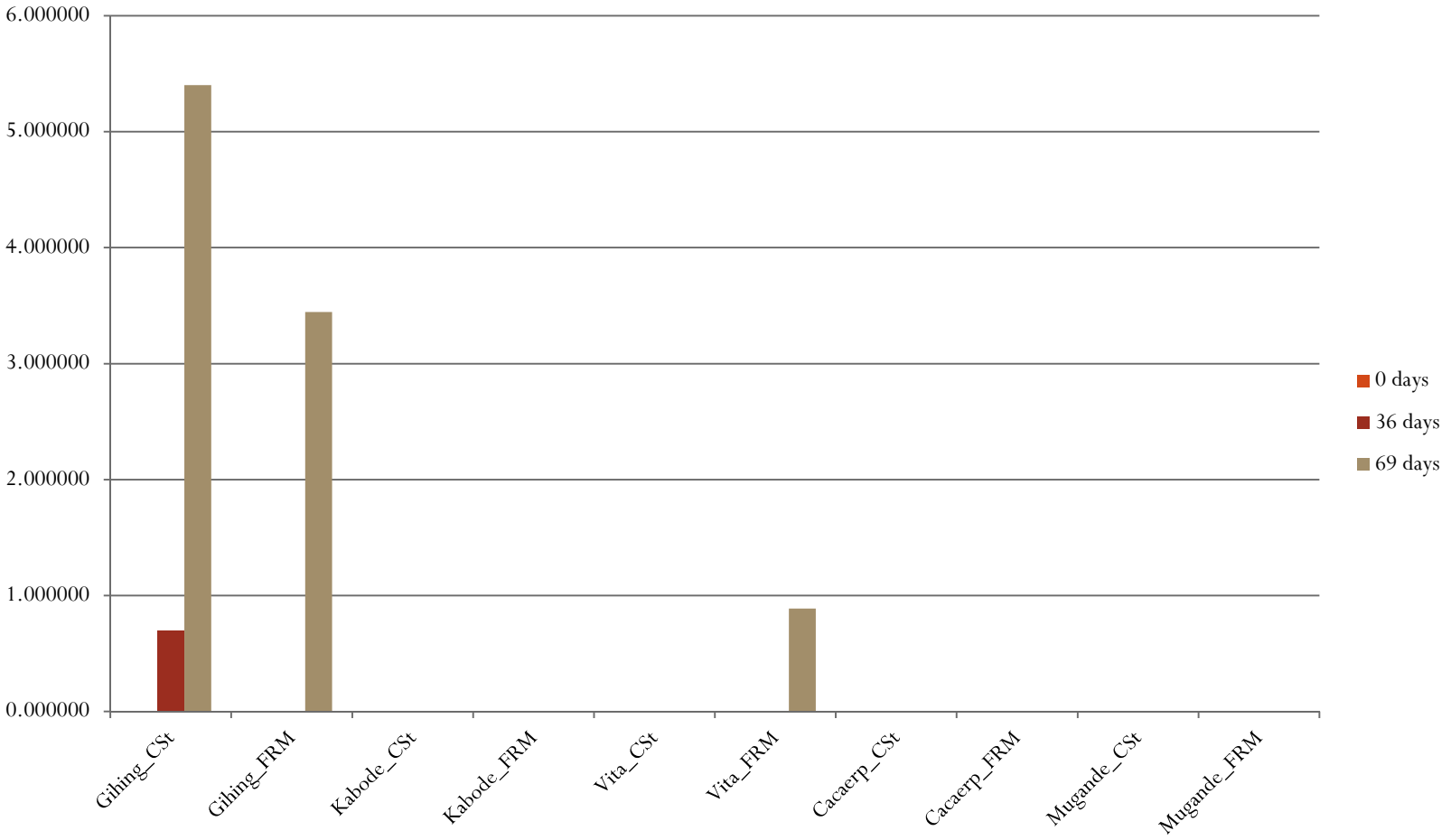
Storage facilities

Results and Discussion

Total soluble solids



Sprouting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Vita_CSt
Vita_FRM
Cacaerp_CSt
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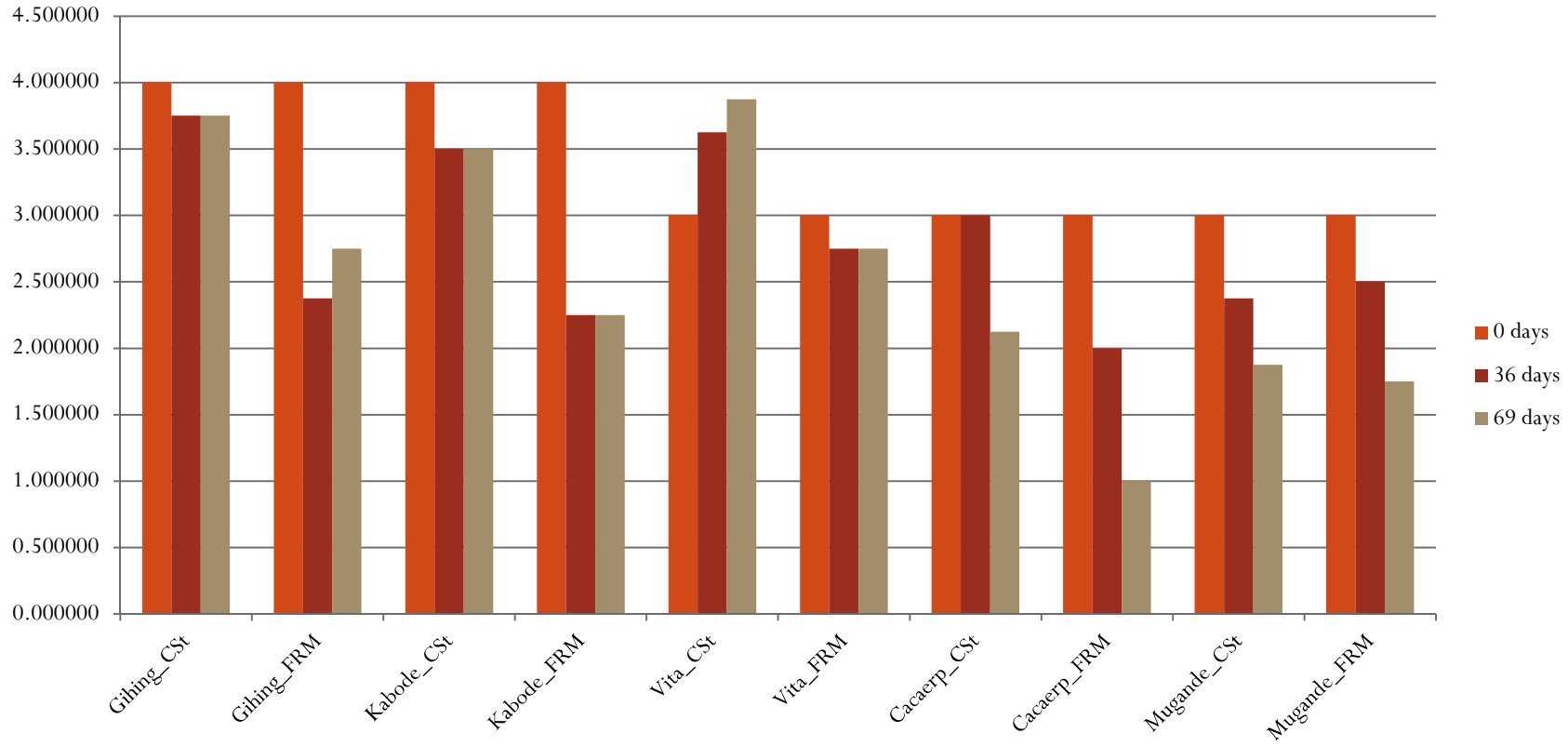
Mugande_CSt
Mugande_FRM
0 days
36 days
69 days

Appearance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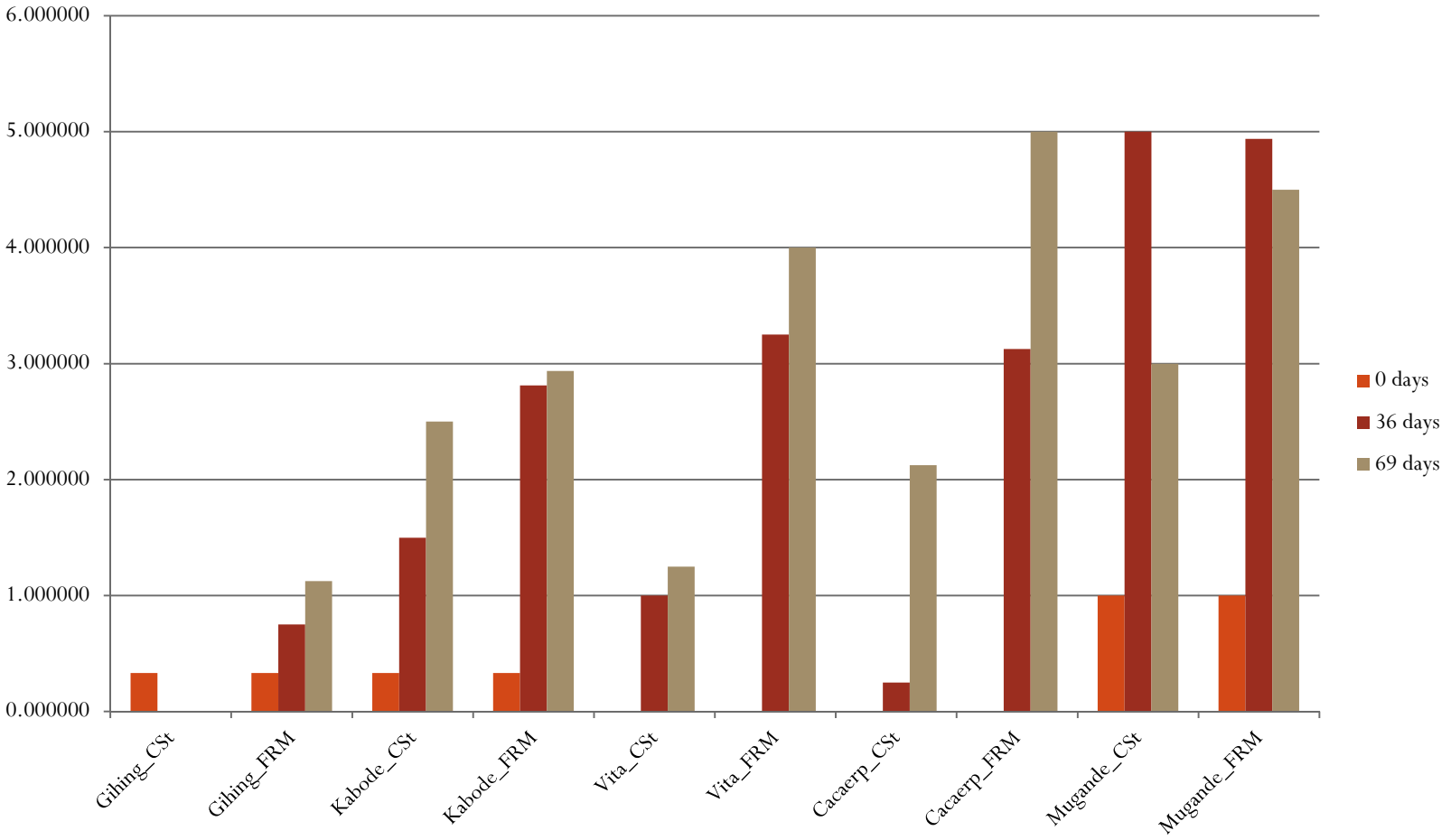
Cacaerp_FRM
Mugande_CSt
Mugande_FRM
0 days
36 days
69 days

Appearance Cnt'd…

Rotting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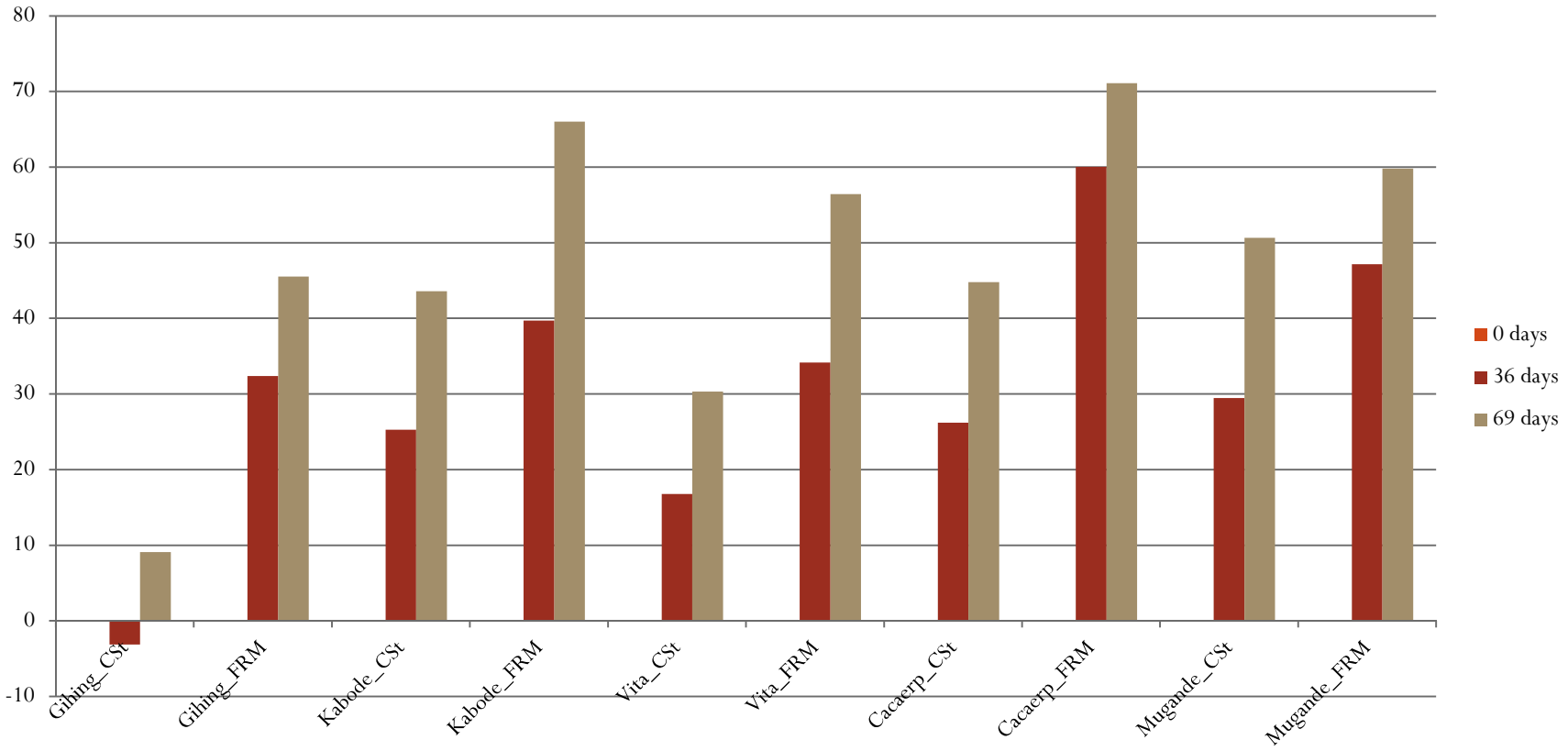
Vita_FRM
Cacaerp_CSt
Cacaerp_FRM
Mugande_CSt
Mugande_FRM
0 days
36 days
69 days


Cacaerpedo
Gihingumukungu
Kabode
Mugande
Vita
0 days
CSt
36 days
FRM
69 days
CSt

% Weight loss


80
70
60
50
40
30
20
10
0
-10
Gihing_CSt
Gihing_FRM
Kabode_CSt
Kabode_FRM
Vita_CSt
Vita_FRM
Cacaerp_CSt
Cacaerp_FRM
Mugande_CSt
Mugande_FRM
0 days
36 days
69 days

Conclusions

- The cool storage structure can help to keep the quality of the roots
- The shelf life of sweetpotato roots depends on the variety, Gihingumukungu maintained its quality after 69 days of storage
- Evaporation of water from the roots led to shrinking thereby affecting their weight and appearance

Recommendations

- There is need to increase the relative humidity inside the storage structure to minimize the rate of evaporation
- There is need to conduct chemical analyses on the roots (Starch, sugars, carotenoids, enzymatic activity etc.)

Question to the Audience!

- Recommend the appropriate “Curing process” under tropical conditions?

Murakoze!