EVAPORATING COOLING SYSTEM

Problem:

1 out of 5 people suffering from Micronutrient malnutrition (MNM), a medical condition resulting from insufficient consumption of nutrients. These people have access to needed fruits and vegetables but lose 20% of their produce due to improper storage. Loses are primarily temperature and humidity related

Goal:

Help combat MicroNutrient Malnutrition (MNM)

Provide better way to store food

Objective:

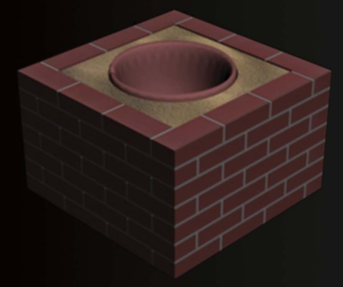
To design, test and implement an evaporative cooler costing $5 or less and that can be implemented and maintained by local people using locally available materials.

IPRO 325-

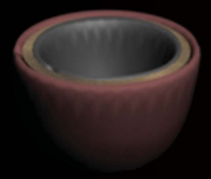
Affordable Solutions for the World's Poor

Prof. Daniel Ferguson

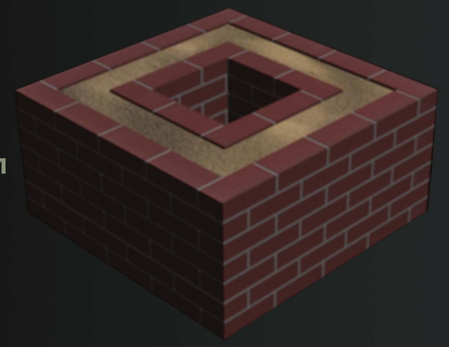
Prof. Ken Schug



HYBRID SYSTEM



ZEER POT
(POT AND POT SYSTEM)



BRICK SYSTEM

SATURDAY(4/19/08)

TIME RECORD	TEMPERATURE OF OUTSIDE (°C)	HUMIDITY OF OUTSIDE (%)	BRICK SYSTEM(°C)	HYBRID SYSTEM
2:47PM	26,4	75	21	22(°C)
3:14PM	25,8	76	21	22
3:26PM	27,1	69	21,2	22
3:37PM	30	71	21	22
3:55PM	28,3	61	22	22
4:08PM	28,4	59	21,9	22
4:20PM	28,8	56	22,2	21,9
4:25PM	28,9	56	22,5	21,9
4:30PM	28,8	55	22	22
AVERAGE	28.06	64.22	21.64	21.98

MONDAY(4/21/08)

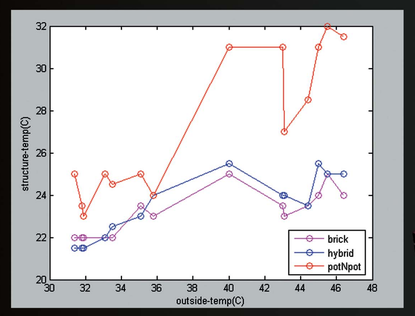
TIME RECORD	TEMPERATURE OF OUTSIDE (°C)	HUMIDITY OF OUTSIDE (%)	BRICK SYSTEM (°C)	HYBRID SYSTEM
9:50AM	34,2	36	19	20 (°C)
9:55AM	35	36	19	20
10AM	35,5	34	19	20
11:7AM	32	52	20	21
11:17AM	34,5	48	21	21,3
12PM	40,6	31	20,9	22
2PM	36,3	40	22,9	23,5
AVERAGE	35.44	39.57	20.26	21.11

TUESDAY(4/22/08)

TIME RECORD	TEMPERATURE OF OUTSIDE (°C)	HUMIDITY OF OUTSIDE(%)	POT N POT SYSTEM(°C)	BRICK SYSTEM	HYBRID SYSTEM
11AM	31,8	43	23,5	22(°C)	21,5(°C)
12:15PM	31,9	43	23	22	21,5
12:30PM	31,4	48	25	22	21,5
1PM	33,1	45	25	22	22
1:30PM	33,5	45	24,5	22	22,5
AVERAGE	32.34	44.8	24.2	22	21.8

WEDNEDAY(4/23/08)

TIME RECORD	TEMPERATURE OF OUTSIDE (°C)	HUMIDITY OF OUTSIDE (%)	POT N POT SYSTEM(°C)	BRICK SYSTEM	HYBRID SYSTEM
11:30AM	35,1	30	25	23,5(°C)	23 (°C)
12PM	35,8	30	24	23	24
12:30PM	43,1	26	27	23	24
1PM	44,4	28	28,5	23,5	23,5
1:30PM	43	29	31	23,5	24
2PM	46,4	29	31,5	24	25
2:30PM	45,5	29	32	25	25
2:45PM	45	34	31	24	25,5
3PM	40	31	31	25	25,5
AVERAGE	42.03	29.56	29	23.83	24.39



Temperature distribution with (26%-48%) humidity

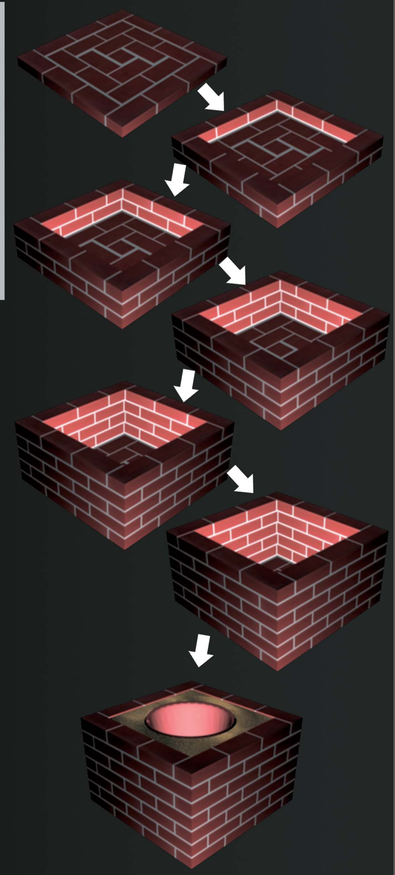
Testing Performed

-Average Pot temperature decrease 12.9°F, 7.17°C

-Average Brick temperature decrease 21.33°F, 11.85°C

-Average Hybrid temperature decrease 20.83°F, 11.57°C

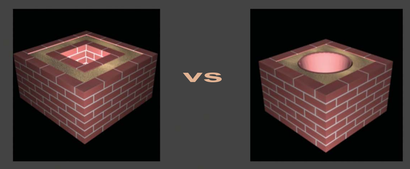
-Best result was a **40°F** drop **(High Heat)**



Manual Images

Layer by Layer process

Conclusions:



vs

BRICK SYSTEM

-Cooler

-Large structure

-More expensive

-Hard to clean

-Hard to maintain

HYBRID SYSTEM

-Near same results as Brick system

-Smaller to build

-Same size storage chamber

-1/3 cost

-Easier to clean & maintain

Additional testing:

-Size and shape variations

-Varying water levels

-Different lid designs

-Long term testing

-Using food from the target region for storage tests

Field Research:

Can targeted region build our design, per our criteria?

Does our design actually work in the field?

How durable will it be in the field?

How long will it last?

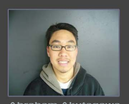
Team members:

Narciso Corral Jr.
Team leader

Sara Wilde
Team leader

Andrew Rust

YoungJu Jo



Abraham Akutagawa