How to improve yield crop in Organic Farming?

A case study of Vegetable and Rice crop on poor acid sandy soil of Angkor Heritage world.

by Dr Tan Boun Suy
APSARA National Authority

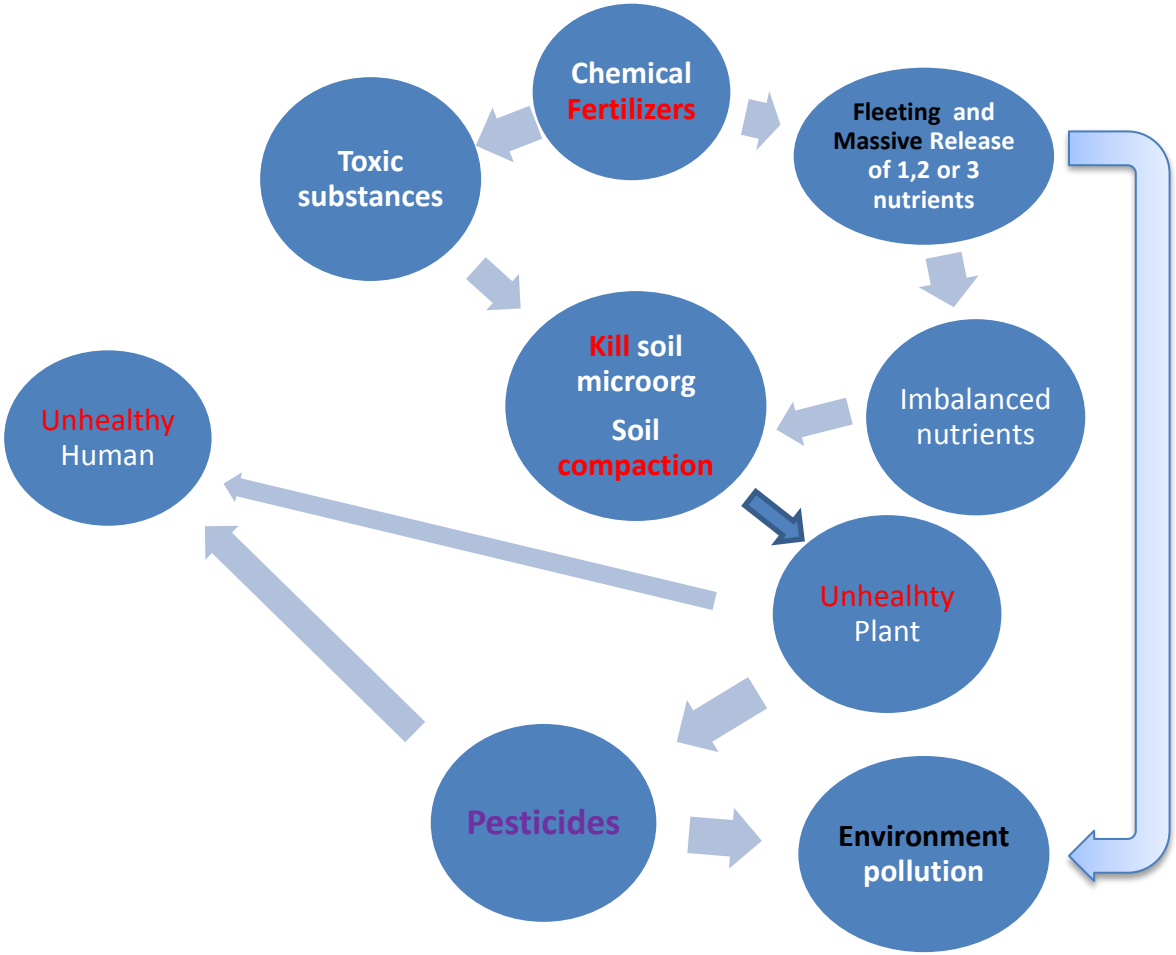
Problem addressed

Compost is the basic natural fertilizer in Organic Farming.

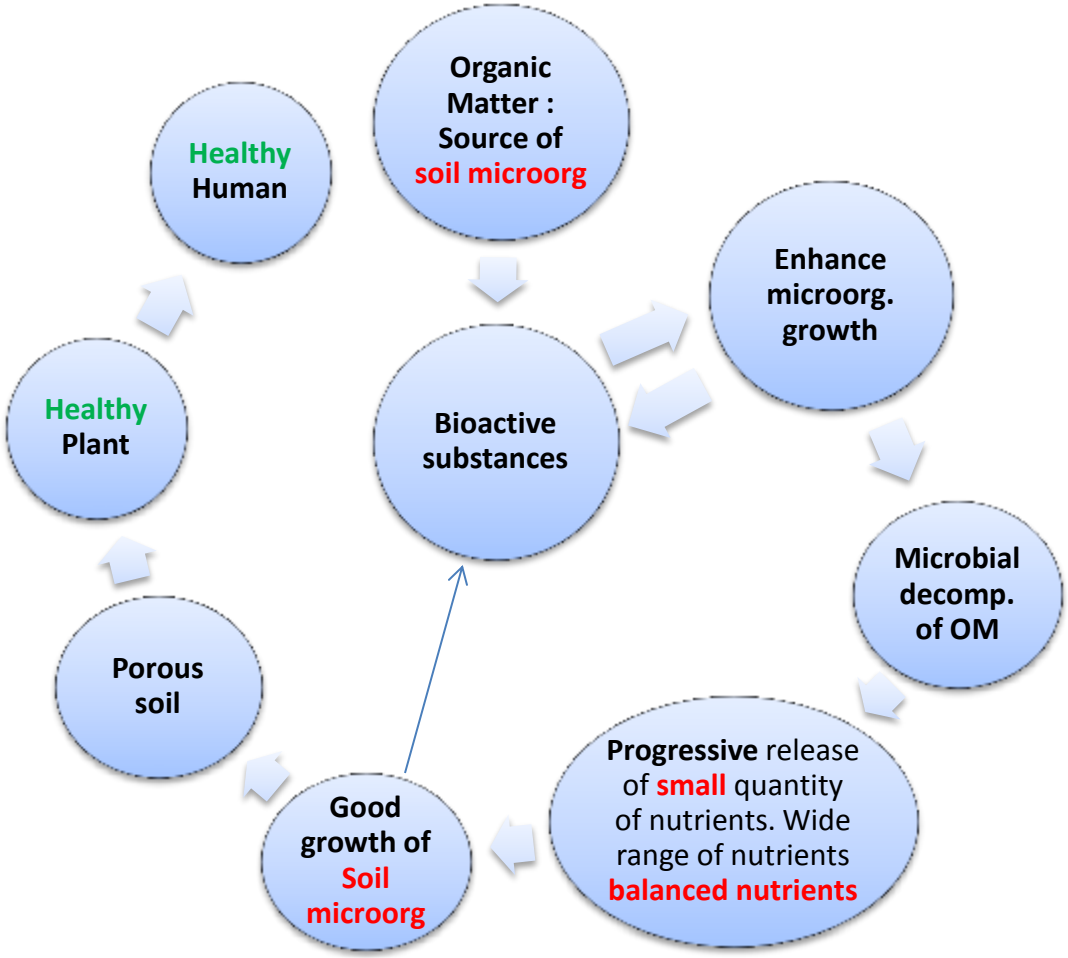
It brings beneficial microorganisms resulting in good health of plant.

But nutrients released is **very low** comparing with chemical fertilizer

Chemical Farming



Organic Farming



Nutrients contents in Tuk Vil Soil, Tuk Vil Compost, Chemical fertilizer, Green manure and Bat Guano

	N Nitrogene %	P2O5 Phosphorus %	K2O Potassium %	CaO Calcium %
Tuk Vil Soil	0.15	0.06	0.02	0.08
15.15.15.	15.00	15.00	15	0
Tuk Vil Compost	1.31	0.62	1.10	1.08
Chromolaena odorata	3.06	1.01	3.07	1.66
Bat Guano	9.99	3.76	1.40	2.52

. Comparison of the effects of *Chromolaena odorata* and *Cassia siamensis* on Rice crops (*Sen Pidor* variety)

	T0	T1	T2
Compost	0.5 kg/m2	0.50 kg/m2	0.50 kg/m2
Chromolaena odorata	0	1.25 kg/m2	0
Cassia siamensis	0	0	1.9 kg/m2
Results: average of the 3 campaigns harvest (kg/16m2)	2.2	3.0	3.1

Comparison of the effect of natural Fertilizers and chemical Fertilizer on green cabbage

Date of harvest	T1 Control	T2 15.15.15 40g/m2	T3 Compost 2Kg/m2	T4 Compost 2Kg/m2 + KEM	T5 Compost 2Kg/m2 + KEM + 15.15.15 (10g/m2)	T6 Compost 2Kg/m2 + KEM +Chromol. (1Kg/m2)
02/23/13	1.0 kg	4.1 kg	2.5 kg	4.2 kg	4.1 kg	4.5 kg
01/13/14	0.8	3.0	1.8	3.5	3.5	5.0
10/09/14	0.9	0.2	1.2	1.3	2.4	2.5
12/27/14	0.4	0.9	1.6	3.1	2.7	3.3
05/17/15	0.8	1.0	1.5	2.5	3.7	6.3
12/29/15	0.5	0.4	1.8	2.2	2.8	3.9

Comparison T2 & T3

(24-2-11)

Comment: In spite of the change due to the seasons, we can observe the following trends in the production.

For **T2** (with only chemical fertilizer 15.15.15) the production rapidly decreases to the level of the control (without any input) T1.

T4 (compost + KEM) > T3 (compost): this shows the effect of KEM

T6 (compost + KEM + 1Kg C*hromolaena*) > **T5** (Compost + KEM + 15.15.15 10g)

This shows **that we can replace** chemical fertilizer by green manure to reach equivalent and even better production.

Conclusion

On sandy soil of Siem Reap, utilization of chemical fertilizer alone is unadvisable.

The compost combined with KEM alone or with green manure is recommended.

Our experimentation in pots

- The effect of *Chromolaena odorata* is fleeting
- The effect of Bat Guano is more sustainable

How about the Rice Husk Ash ?

According to Priyadharshini and T.H. Seran, 2010

Paddy Husk Ash from various locations contains:

- **K2O: 0.72 - 3.84%**
- **MgO: 0.23 - 1.59%**
- **P2O5: 0.01 – 2.68 %**
- **pH: 8 - 11**

Key issues

1.***Chromolaena odorata***

Need to grow this spontaneous plant

2. Bat Guano

Expensive

3. Rice Husk Ash

- Cheap and available in great quantity
- The most interesting for amending sandy acid soil

Thank you

for your kind attention