INSECTS & WEEDS IN SOLANACEOUS CROPS:

An alternative perspective on the role of weeds in Pest Management in the tropics

37th Annual Scientific Meetings of Pest Management Council of the Philippines. Davao City May 2-4, 2006.

The basic premise that weeds compete with the main crop for space and resources

• has dictated the current cultural management recommendations for these crops most especially weed-free farming.

Thus, basically, no weeds are allowed to grow all throughout the cropping period
(less diversity in farming systems)

- Few previous works in other countries (Miguel Altieri)
- Presents evidence for tolerance if not encouragement of weed growth (regulated)
- To gain from the potential benefits from the weeds' existence in agroecosystems.
- These benefits include pest regulatory effects.
- Those works were very general
- did not focus on solanaceous crops.
- Still, however, the concepts espoused therein relate to all other plants

As weeds have always been perceived as “unwanted” or “taboo” in crop production, their potential benefits have also been neglected especially under tropical countries like the Philippines.

(Paller, Obien, Rasco)

Weeds are always taken for granted (WEEDS ARE BAD)

-Harbor natural enemies

-Reduce insect pest population

-Enhance biodiversity of plants

-Serves as alternate host of insect pests

Further, weed control is almost always associated with the use of herbicides and hand weeding (clean culture, floor-waxed)-

the usual practice that most farmers follows.

Curriculum for BSA.

This paper

1. **reviews the concept of tolerating weeds as a way of diversified farming that could be beneficial in Philippine Agriculture especially in the context of insect pest population management and host resistance, citing specific examples with solanaceous crops.**
2. **present other benefits consequent of tolerating the presence of weeds in relation to improved crop production**
3. **show some examples**

Historical background:

HOW THIS IDEA CAME ABOUT

***15 yrs ago…IPB screencage, laborer (Maeng) left the eggplant unweeded –**

"eggplant can tolerate weeds" even more robust in the presence of weeds

***field observations that pepper can also tolerate weeds and bear better fruits**

***UP Rural HS students conducted a study on the "effects of weeding levels on the leafhopper in resistant and susceptible eggplant)**

Underlying mechanisms (Based on Altieri's):

INSECT PEST POPULATION MANAGEMENT

a. Increase population of herbivores (serves as alternate hosts or prey to entomophagous insects (improve survival and reproduction of beneficial insects)

b. Plant dispersion and diversity appear to influence herbivore density (altering movement of searching behavior, as well as host-plant interaction)

HOST RESISTANCE

Expression of resistance (GxE) – one modern interpretation of the favorable environment for HR maybe a diversified crop environment.

Other benefits of tolerating/regulating the presence of weeds in relation to improved crop production

EFFECTS OF WEEDING LEVELS ON LEAFHOPPERS ON RESISTANT AND SUSCEPTIBLE EGGPLANTS

- Regulated weeding & No weeding (vs. total weeding)

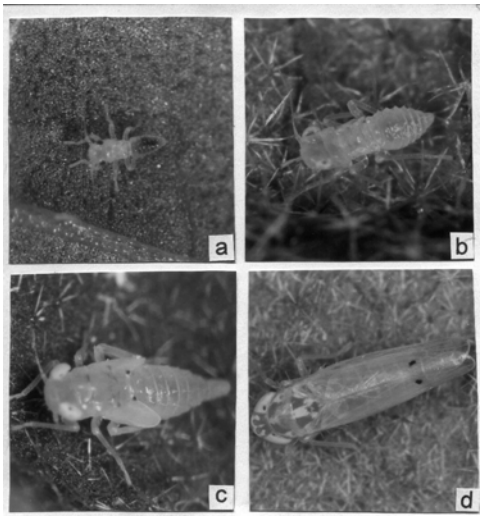
– greatly lessened insect pest populations

– harbored more natural enemies

- Resistant varieties had fewer pests that susceptible ones under all weeding levels

- weeds under regulated weeding were more diverse than those on unweeded plots (higher biodiversity promotes more natural enemies)

(by UP Rural High School students, 2002
– Sison LAQ, Lit CC, Esguerra GSS)



Cotton leafhopper
Amrasca biguttula

Larva

Adult

Shoot/Fruit Borer Damage

Leucinodes orbonalis Guenee

FARMERS

EXPERIENCES

Balete, Batangas

(farmer cooperator)

1. “Tabas Canor”

-establish the crop first

By “gamas” weeding 30 days after transplanting

(critical for the first 30 days)

“Tabas Canor”

-tolerate weeds after 30 days and beyond by using “tabas” weeding (‘waist’ length)

“Tabas Canor” - intercrop main crop with other crops or allow weeds to grow (regulated weeding)

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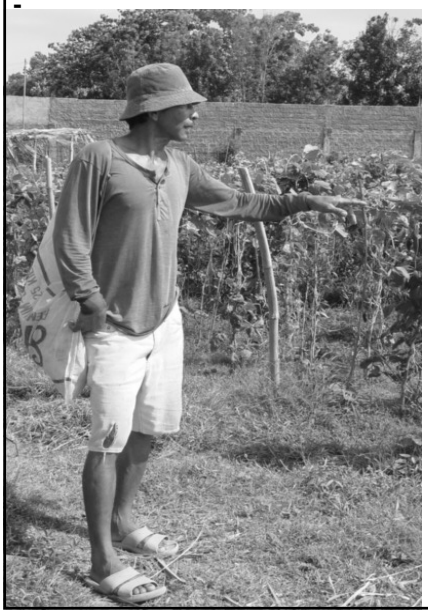

“Tabas Canor” – increase income

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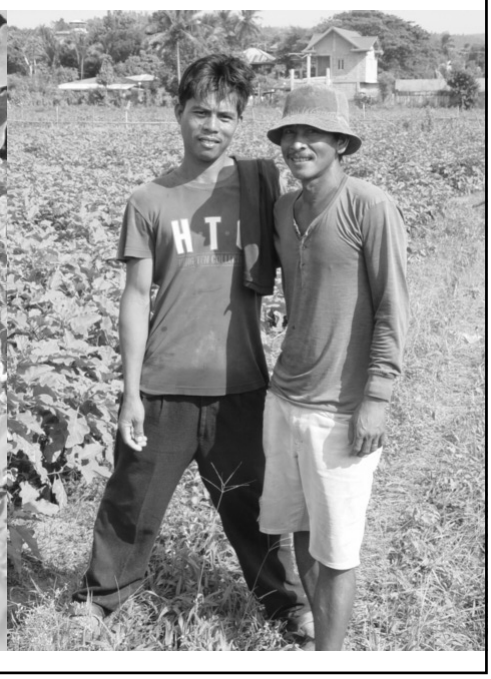
2. “Halong Biyô”

-eggplant as the main crop, Virgilio (or Biyo) intercropped eggplant with pepper (to increase income)

“Halong Biyô”- intercropped with different kinds of pepper (for sinigang, tinola, condiments) – “sayang ang panahon”

“Halong Biyô” – intercropped with okra

“Tabas Canor” and “Halong Biyô”



ALSO OBSERVED IN OKRA
(Malvaceae)

unweeded

weeded

Special considerations for this concept:

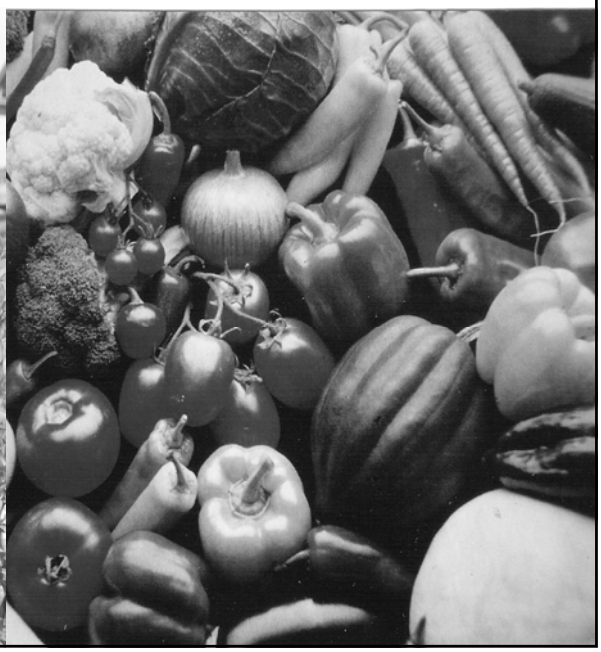
1. May be applicable only for small-scale vegetable farmers
2. Farm characteristics:
   - -most vegetable farm size >1.0
   - -manual operation in all farm activities
3. The kind of weeds present in a particular region
4. Other factors?

THE
BIG
ADVANTAGE:

HUMANS (consumer & farmers)
ENVIRONMENT
ECONOMIC

Summary - benefits of weeds in terms of insect pest population mgt and host resistance

"Tabas Canor" and "Halong Biyo" = BIODIVERSITY



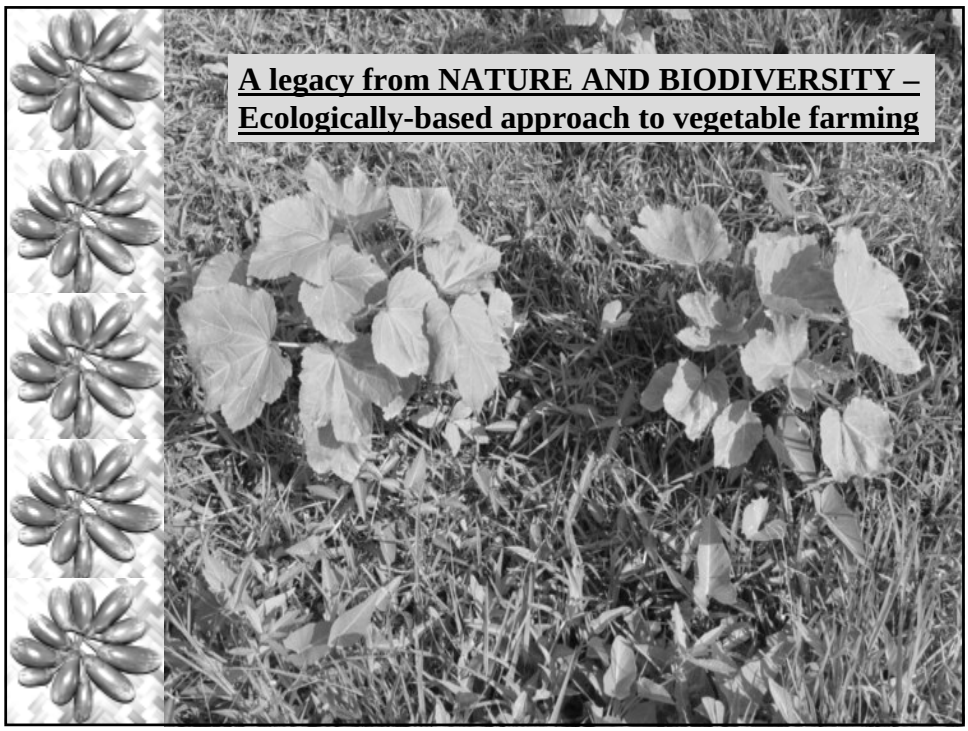
Recommendations:
WE NEED HARD DATA!
WE NEED basic studies on the effect of weeds and weed management on insect pest population and host resistance to pests & if possible effects on all the different components of the ECOSYSTEM.

BIODIVERSITY

BIODIVERSITY

BIODIVERSITY

CHALLENGE the basic premise that weeds compete with the main crop for space and resources Can they co-exist when managed properly?


A legacy from NATURE AND BIODIVERSITY –
Ecologically-based approach to vegetable farming