

Discussion

A. SAVAPRAGASAM: Do you know the reason why, although there is high oviposition on PI234599 cauliflower compared to the other varieties, the number of larvae tends to be low? Is this due to poor egg viability?

C. J. ECKENRODE: No, the egg viability was good on all varieties in these tests. The reason that few larvae are found on PI234599 cauliflower grown in the field is that the larvae either leave the plants because they are unacceptable or are killed shortly after they hatch.

R. S. REJESUS: You observed that light and N influenced resistance inside the greenhouse as opposed to outside. Any possibility that either light or nitrogen is an immediate mediator for the loss or enhancement of resistance?

C. J. ECKENRODE: This has not been determined with certainty, but Dickson and I believe that antibiosis is present in the glossy lines when grown in the field. It is quite possible that light and/or nitrogen influence this.

T. H. CHUA: Could you comment on the taste and quality of the resistant varieties?

C. J. ECKENRODE: The taste is perfectly normal, the quality of the cabbage is quite good, but the color may be foreign to some consumers. I do not see any problems with cauliflower.

T. H. CHUA: Why do you think the female DBM prefers to lay eggs on the resistant varieties?

C. J. ECKENRODE: Because of the tactile feel of the smooth leaf or because of some difference in the chemical composition. We are trying to get information on differences in its chemical make-up.

N. WILDING: Speakers have spoken about longevity of different stages in the lifecycle of DBM and about its fecundity. I assume that this work has been done with one or more local strains of the pest. Has any of the speakers studied these factors in strains from elsewhere? How genetically homogeneous in this insect?

C. J. ECKENRODE: It is most probable that such differences do exist.

T. H. CHUA: Do you anticipate the development of biotypes in DBM similar to those of brown planthopper which broke down the resistant rice varieties?

M. H. DICKSON: It is possible, but that is why we also have a breeding program based on multiple gene resistance which would be harder for a biotype to overcome. The breeding program is also more complicated.

G. S. LIM: Your work shows potential for the use of resistant cultivars to suppress DBM population. Are you aware of any case where crucifers resistant to DBM are cultivated on a fairly large scale?

M. H. DICKSON: No. We intend to test these materials in large plots in 1986.

J. HOFFMANN: Did you obtain glossiness in leaves of DBM resistant cabbage by genetic manipulation or by selection?

M. H. DICKSON: The PI 234599 which had resistance to DBM has glossy leaves. Not all lines with glossy leaves are resistant, only those with the gene for glossy leaves from PI 234599. There are a number of other genes which confer glossy leaves.

B. ROWELL: We grew a cabbage cultivar, Cornell line from Peto Seed Co, which has glossy leaves. But the damage to this line was not less than others. Could it be due to much higher insect population pressure?

M. H. DICKSON: Young plants appear to be quite susceptible, but develop resistance as they mature. This was observed in trials in the Philippines and Australia. There is also some difference in levels of resistance in lines with the glossy leaves, we observe this regularly and it was also apparent in the Philippines. I do not know which of these lines I released was tested by Peto, but I know one was not very resistant to DBM. The lines were released as resistant to lepidopterous pest, more specifically to *Pieris rapae* and *Trichoplusia ni* at the time of release. Since then we have done more selection for tolerance to DBM.

G. S. LIM (COMMENT): We also have done some studies on the effect of tomato extract on DBM and would like to share our findings here. We found that tomato extract (1 g ground up leaves in 1000 ml water) will cause reduction in oviposition by DBM adults but has no significant effect on the development and survival of DBM larvae that may be already present on the plants.

T. R. OMOY: You showed the beneficial effect of tomato intercropping on DBM control. Is there any specific cultivar requirement for tomato to be effective? Would tropical tomato do?

N. S. TALEKAR: There is no specific cultivar requirement for tomato to be effective. We used heat-tolerant, heat-sensitive and even wild tomato (*Lycopersicon hirsutum* f. *glabratum*) and all gave equally beneficial effect as far as deterring the DBM adults from laying eggs is concerned.

M. P. FERINO: Would a lower plant population of the intercrop have the same effect on the DBM as the normal plant population?

N. S. TALEKAR: We have not yet studied this aspect. It would be the aim of a future study to lower the intercrop population to the bare minimum required for DBM control since some of the intercrop species are not economically important and we do not want to waste land under such crops.

T. H. CHUA: What would be the cost of installing the sprinkler system. I think the cost of US\$1000 per 0.2 ha is too high for small farmers to adopt.

N. S. TALEKAR: Yes, the initial cost is definitely too high for small farmers to utilize this system. However, this system can be used over several cropping seasons. This, combined with the savings on insecticide cost and labor cost, will make the system economical. In the meantime we are trying to modify the system to make it less costly as well as more effective.

E. D. MAGALLONA: Usually, with high moisture, such as under sprinkler irrigation, development of diseases is encouraged. Was there any noticeable difference in disease incidence between your check and sprinkler irrigation treatments?

N. S. TALEKAR: No, we did not observe any unusually high incidence of disease with cabbage. I am, however, afraid that the disease problem will be important if we use cauliflower or broccoli.

L. C. CHANG: What is the present situation in the use of parasites for DBM control in Taiwan?

N. S. TALEKAR: Certain parasites were introduced in Taiwan specifically to control DBM about 10 years ago but the parasites did not get established, possibly due to

excessive use of insecticides. Nothing was done after that. At the moment AVRDC has imported *Diadegma eucerophaga* from Indonesia and we are mass rearing it for release on farmers' fields starting autumn 1985.

T. MIYATA: Your overhead sprinkler system shows promising results as far as DBM control is concerned. Does this method also control other insects such as cabbage looper and cabbage butterfly?

N. S. TALEKAR: During the experimental period we did not get cabbage looper infestation at all and cabbage butterfly population was too low and too unevenly distributed to get any realistic information on its control. However, sprinkler irrigation significantly reduced aphid population. But aphid infestation was rather low and came during late growing stage and its reduction could not have contributed to increased yield.

A. SIVAPRAGASAM: Did you observe any direct effect of overhead sprinkler irrigation on larval mortality, egg mortality, and adult behavior in the field?

N. S. TALEKAR: No, we merely recorded the number of DBM larvae and pupae and yield in both control and overhead irrigation treatments. We did find though that during application of sprinkler irrigation DBM adults flew around and some of them were caught under the water jets and washed away.

B. ROWELL: Do you see crucifer tomato intercropping in Taiwan?

N. S. TALEKAR: It is not common. Crucifers are grown in specialized vegetable production areas for domestic fresh market use and export, whereas tomato is mainly grown for processing in different areas. The farmers who grow these crops are different. I have, however, observed crucifer- tomato intercropping in North Sumatra where both crops are grown for the fresh market.