Cabbage in Ghana

PERFORMANCE OF Algifol AMONG OTHER PLANT GROWTH HORMONES AND PESTICIDES IN CABBAGE CULTIVATION IN GHANA

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Introduction

Cabbage, Brassica oleracea var. Capitata is an important vegetable cultivated and consumed by both urban and rural dwellers in Ghana. Because of increase in demand by consumers, cabbage is now cultivated all year round. This has given rise to some biotic and abiotic factors that militate against the successful cultivation of the crop. One of the abiotic factors is water availability, particularly during the dry season from November to March. To avert this prob-lem and increase production, there is the need to conserve water for normal growth of the crop. One of such methods of conserving water is to minimise evapo-transpiration of the crop.

Algifol is a plant growth stimulant that has the additional property of reducing stomata pore size, thereby conserving water within the plant for optimal utilisation during dry spells. The product has the ability to suppress insect pest damage on crops.

The objective of the study reported on was therefore to evaluate the efficacy of Algifol in conserving water and enhancing plant growth in the production of cabbage in Ghana.

Methodology

The experiment commenced on 28th April, 1998, when cabbage seeds (variety K-K Cross) were nursed and later pricked on 5th May, 1998. Transplanting was done on 26th May, 1998 (4 weeks after germination) and harvested on 25th August 1998. In all 7 treatments viz. Algifol and Minzyme (plant growth hormone), Garlic gard and Neemol (botanical extracts), Dipel 2X and Karate (biological and chemical insecticides respectively), and a water spray control were evaluated. Each treatment was replicated 4 times in a Randomised Complete Block Design (RCBD) planted at Kwadaso-Kumasi at 0,45m within and between rows. Plant population was 18 per plot. Weeding was done as and when necessary.

Parameters considered were:

- Plant establishment
- Plant girth
- Plant height
- Number of multiple heads
- Insect pest population
- Head damage at harvest

- Natural enemy population
- Yield (head weight)

Results

The results were subjected to Analysis of Variance (ANOVA) with all count data transformed by the formula y = (x+0,5)1/2.

Plant establishment

This ranged from 100,0% in the Karate treatment to 93,1% in the Neemol treatment. There was however no significant differences observed among the treatments at the 5% level of sig-nificance. The Algifol treatment however ranked 2nd with an establishment of 98,6%.

Plant girth

Even though there were no significant difference observed at P <0,05, the Algifol treatment ranked highest i.e. performed best. The range was 42,9cm in the Algifol treatment to 38,3cm in the control.

Plant height

The results did also not show any significant differences at the 5% level of significance. However, the Algifol treatment performed best with a plant height of 21,8cm. The lowest height of 19,8cm was observed in the Karate and Minzyme treatments.

Number of multiple heads (damage caused by Hellula undalis to terminal buds)

Multiple heading is mainly caused by H. undalis and is measured as a percentage of estab-lished plants whose terminal buds were damaged by H. undalis resulting in the growth of multiple heads. With regard to this parameter, the Karate treatment was significantly different from the Algifol, garlic, Minzyme and the control treatments, though not different from the Dipel 2X and Neemol treatments at the 5% level of significance. Generally, the insecticides performed better than the plant growth hormones. This is not surprising since the insecticides are more effective in killing insects.

Insect counts

Counts of insects such as Aphids, P. xylostella and H. undalis were generally low during the period of the experiment. However, their numbers were slightly higher on the Algifol, Min-zyme (plant growth hormones) and the control treatments. This notwithstanding, the vigorous growth observed in the Algifol treatment compensated for the damage attributed to insect pests as observed in the yield.

Head damage by Plutella xylostella at harvest

There were significant differences observed among the treatments. The Algifol, Dipel 2X, Neemol amd minzyme treatments were statistically the same but significantly had lower

dam-age than the remaining three treatments namely, Garlic. Karate and the control at the 5% level (table 1).

Treatment	Mean Plutella damage
Algifol	1.35
Garlic	1.52
Dipel 2X	1.30
Neemol	1.38
Minzyme	1.48
Karate	2.05
Control	1.65
G. Mean	1.53
C.V.	25.57
LSD (5%)	0.58

Table 1

The lower head damage observed in the Algifol treatment suggests that it has some insecticidal properties in addition to reducing evapo-transpiration.

Natural enemy populations

Generally, there were more syrphids than spiders on the field. With the exception of the chemical insecticide treatment, which had relatively lower counts of natural enemies, there was no direct relationship in the natural enemy populations on the other treatments. Neverthe-less, it can be said that the plant growth hormones, botanicals and bio-pesticides have lower or no direct effect on natural enemies.

Yield (Cabbage head weight)

Cabbage head weight ranged from 0,98 kg/head in the Karate treatment to 1.2 kg/head in the Algifol treatment though not statistically different from each other. It is however clear from the results that the Algifol has a comparative advantage over the other treatments which in-cluded a plant growth hormone.

Conclusion

The results above though preliminary, clearly indicate that Algifol has a comparative advan-tage in conserving water for optimal growth and suppressing insect pest attack on cabbage. It must be emphasised that the experiment did not suffer any drought conditions since it was conducted during the rainy reason. A final conclusion (which is very likely to be favour of Algifol) would be drawn at the end of a repeat experiment in progress.