Effects of mulch on Diamondback moth, Aphids, black rot and weeds on Cabbage (*Brassica Oleracea*)

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Economic Importance

• Source of food, i.e. its an excellent source vitamin C and K.
• Contain antioxidants.
• Medicinal value.
• Used as animal feed.
• Earns a country foreign exchange.
• Creates employment.
Problem Statement

- Decreased production of cabbage is caused by diseases, pest and weeds.

<table>
<thead>
<tr>
<th>Diseases include:</th>
<th>PESTS</th>
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<tbody>
<tr>
<td>- black rot</td>
<td>• Aphids</td>
</tr>
<tr>
<td>- black leg</td>
<td>• Webworm</td>
</tr>
<tr>
<td>- cabbage wilt</td>
<td>• cutworm</td>
</tr>
<tr>
<td>- club root</td>
<td>• Cabbage looper</td>
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<tr>
<td></td>
<td>• flea beetle</td>
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<tr>
<td></td>
<td>• cabbage budworm</td>
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<tr>
<td></td>
<td>• cabbage moth</td>
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<td></td>
<td>• diamond back moth</td>
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</table>

- weeds such as mustards, charlock, shepherd purse, Virginia pepperweed and acres
- weeds cause world crop losses worth approximately $150 billion annually (Agrios, 2005)
Symptoms of Black rot and weeds

V-Shaped lesion

Courtesy of Agrios & wikipedia
Damages caused by DBM

Courtesy of Wikipedia
Justification

• The use of mulch reduces the cost in controlling DBM, black rot and weeds.
• It not only controls the production problem but also adds organic content and humus hence increasing soil fertility.
• Organic mulch is readily available.
• It increases yield
• Its is environmentally and ecologically friendly.
objectives

General objectives
• To enhance cabbage production by reducing black rot, weeds, diamondback moth and aphids.

Specific objectives
• To determine the effects of different types of mulch on weeds.
• To evaluate the effects of mulch on black rot.
• To evaluate the effects of mulch on diamondback moth and Aphids
Methodology

• Experimental site: the field experiment was laid out at Kabete field station
• Experimental design: randomised complete block design with four blocks.
• Land size was 21m by 11m
• Each plot was measure 2.5m by 2m
• Block to block and treatment to treatment spacing was 1m.
• Plant to plant spacing was 60cm by 60cm.
Methodology cont.....

**Treatments**
Six treatment included:

T1-Organic treatment: **grass**
T2-black,
T3-yellow **plastic mulches**
T4-clear mulch.
T5-weeded
T6-nonweeded **controls**
Objective 1: to determine the effects of mulch on weeds

- Seeds were raised in a nursery bed.
- Transplanting was done after 28 days.
- There was an initial uniform weeding.
- The treatments were laid after one week after transplanting.
- In T1, T2, T3, T4 and T6, the first weed count was done using 1m by 1m transect after 14 days.
- Recording the type and the number of weeds.
- In T5, there was frequent uniform weeding.
- Normal agronomic practices were carried out.
Objective 2; to evaluate the effects of mulch on black rot.

- Seedlings were transplanted to a field that is known to be infested with the *X. campestris*.
- After laying the treatments, the first disease incidence was assessed after a week.
- Monitoring of the disease was done after every week to check on the disease severity and disease incidence.
Objective 3; to evaluate the effects of mulch on DBM

- Seedling were raised in a seed bed and transplanted on the 28th day.
- Laying of mulches was done after one week later to allow for shock allowance.
- On that same week, first count of DBM incidence was done.
- Pest inspection and Damage progression data was taken after every one week.
Data collection and analysis

Data was collected after every one week.
Data was collected on:
i. black rot incidence and severity.
ii. Weed count.
iii. DBM and Aphid count.
• Data was analyzed using Excel and GenStat.
RESULTS & DISCUSSION

• Effects of Mulching On Weeds
Result cont.

- Effect of mulching on Black rot
Effect of mulch on Diamondback moth and Aphids.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>DBM</th>
<th>APHIDS</th>
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<tbody>
<tr>
<td>Organic mulch</td>
<td>4.1a</td>
<td>148.9 ± 56.27</td>
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<tr>
<td>Black mulch</td>
<td>3.35a</td>
<td>234.7 ± 22.62</td>
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<tr>
<td>Colored mulch</td>
<td>2.85a</td>
<td>122.6 ± 36.06</td>
</tr>
<tr>
<td>Clear mulch</td>
<td>3.35a</td>
<td>132.1 ± 4.94</td>
</tr>
<tr>
<td>Weeded control</td>
<td>2.85a</td>
<td>257.7 ± 5.66</td>
</tr>
<tr>
<td>Un-weeded control</td>
<td>3.35a</td>
<td>186.8 ± 81.8</td>
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<tr>
<td>LSD (P=0.05)</td>
<td>2.03</td>
<td>109.93</td>
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CONCLUSION

Effect of mulching on weeds
Different kind of mulch was found to have different effect on weeds

Effects of mulch on Black rot
The results of this showed that mulch only reduces disease incidence and spread by smaller percentage.

Effect of Mulch on Diamond Back Moth And Aphids
Diamond back moth control was effective in organic treatment. The colored mulch attracted the diamond back moth and aphid
RECOMMENDATIONS

• Farm practitioners and any other farmer to opt for both organic and in-organic mulching as it is efficient in controlling weeds.

• For pests control, colored polythene mulch should not be used as it attracts the pest.

• To minimize black rot occurrence, farmers are advised to use drip irrigation