

ADEQUACY OF LOCALLY ACCESSIBLE PLANT MATERIALS IN CONTROLLING POTATO TUBER MOTH PERVASION OF POTATO IN STORES

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ABSTRACT: Potato tuber moth is a vital nuisance of potato both in the field and stores. It is more significant in the stores as the market worth of the pervaded tubers is totally decreased. Utilization of bug sprays in the stores can cause a grave wellbeing hazard to shoppers and ranchers. To deal with the irritation in the stores, IPM choices must be investigated. This study was directed to survey the adequacy of locally accessible botanicals like *Eupatorium adenophorum*, *Pot sativa* and *Artemisia myriantha* in controlling pervasion of tubers by potato tuber moth. Results has shown that most un-number of pervaded tubers was seen in the tubers covered by *Artemisia myriantha* (42%) trailed by *Marijuana sativa* and compound treatment (52%).

KEYWORDS: *Phthorimaea operculella*; *Solanum tuberosum*; IPM; botanicals; adequacy; normal repellants.

INTRODUCTION

Potato tuber moth (*Phthorimaea operculella* Zeller) is one of the most harming bug nuisances of potato in both the field and capacity. It is monetarily more significant in hotter environments. For its fast development and augmentation, temperature is generally basic. A typical everyday temperature of 20-25°C is ideal for its turn of events (Raman, 1988). The hatchlings of the vermin influence both the aeronautical parts and tubers in the field. Nonetheless, tuber pervasion is more significant as it brings down or totally eliminates its fairly estimated worth.

This nuisance has become so significant in the vast majority of the nations in the jungles and sub-jungles that in certain, legislatures needed to figure out regulation for its control (Das, 1995). It is likewise arising as a difficult issue in some potato developing districts of Bhutan. In

Bhutan the issue of potato tuber moth pervasion in stores is for the most part found across locales that are in the height scope of 1700-2400 m (BPDP, 2006) where the temperatures are ideal for its action. In the BPDP study (2006), 29% of respondents referenced it to be the main stockpiling issue.

Many examinations have been led to oversee potato tuber moth both in field and capacity particularly to substitute utilization of insect sprays for potatoes in stores as it isn't alright for customers. Besides, there are chances of nuisance creating protection from synthetic substances whenever utilized much of the time.

Utilization of plants, called as botanicals, which are normal repellants, is one part of IPM approach. Many plants have been utilized as normal repellants in administration of potato tuber moth in potato stores. Invasion was decreased when potato tubers were covered with hacked and dried leaves of *Ambrosia artemissifolia* L and *Eupatorium odoratum* L (Lal, 1987), *Pot sativa* (Kashyap et al, 1992) and furthermore when tubers were put away with garlic bits (Sen, 1954). In our review, we investigated the adequacy of locally accessible plant materials in Bhutan, used to give actual obstructions, in overseeing potato tuber moth pervasion and harm of tubers in stores.

Materials and Strategy

The height of this area is 638 m above ocean level so the temperatures are higher in any event, during those three months, which is ideal for the bug action and consequently, pervasion. To survey the degree of tuber pervasion by potato tuber moth, clean, un-invaded seed tubers were utilized. To guarantee high irritation pressure, tainted tubers, gathered from ranch stores, were put close by the perfect tubers in the store, as a wellspring of the vermin.

Both the spotless and tainted tubers were placed in boxes and kept in the store. The spotless potato tubers utilized for the preliminary were exposed to the medicines as follows: 1) untreated control; 2) Synthetic (0.1% Fenvalerate); 3) *Eupatorium adenophorum* ; 4) *Pot sativa*; 5) *Artemisia myriantha*. Dried and slashed type of the plants (medicines 3, 4 and 5) was utilized to cover tubers to 2-3 cm layer thickness. For the compound treatment, tubers were absorbed 0.1% fenvalerate for ten minutes toward the start of the preliminary. For control, the tubers were

exposed to none of the medicines and left for all intents and purposes. A randomized total block configuration was utilized. Every treatment contained 50 tubers in a container of aspects 36cm x 28cm x 18cm and was recreated multiple times.

RESULTS

Recurrence of invasion

The qualities are communicated as level of plagued tubers to the complete number of tubers utilized for every treatment 100 percent pervasion was seen in the control. Potato tuber moth pervasions on tubers were essentially lower in the medicines with synthetic and plant materials than in the control. In any case, the pervasion levels between medicines with compound and the three plant materials didn't vary altogether albeit the most un-number of pervaded tubers was kept in the Artemisia treatment (42%) trailed by Pot and synthetic treatment (52%). These plants are normal repellants and gone about as an actual hindrance between the tubers and the irritation in this way lessening pervasion and harm of tubers. In spite of the fact that, it was normal that the compound treatment would be moderately more proficient in controlling pervasion, the plant materials utilized were likewise similarly productive as the synthetic treatment. This could be credited to the way that the tubers were treated with the substance just once when the preliminary was set up due to which the synthetic treatment probably become inadequate to shield tubers from the bug after a specific timeframe during capacity

Force of invasion

The distinction in the force of pervasion between the medicines was profoundly huge. The power was extremely high for control with 3.4 openings per tuber though, number of openings of was recorded when tubers were treated with the substance or covered with the plant materials. Least number of pervasion focuses or openings was seen in the Artemisia treatment (0.6). Then again, comparative qualities (0.9-1.0) were recorded for the substance, Eupatorium and Marijuana medicines. The power of pervasion was 27%, 27%, 30% and 17% of that of control for synthetic, Eupatorium, Weed and Artemisia medicines separately. Extremely low degree of harm was found on the treated tubers when contrasted with those of the control which were harmed seriously because of the focused energy of pervasion.

DISCUSSION

We found that while 100 percent of the tubers in the control were harmed with a normal of 3.4 invasion focuses per tuber, both the recurrence and power of invasion was least in Artemisia

treatment (42% and 0.6 separately) contrasted with different medicines albeit not altogether unique. This shows that the un-safeguarded tubers in the control were presented to rehashed pervasions by the potato tuber moth throughout the multi month capacity period. Then again, Artemisia which has, even by actual evaluation, the most impactful smell contrasted with the other two plants might have been more proficient in repulsing the irritation and consequently diminishing pervasion.

Our outcome showed huge contrast in pervasion between the untreated control and the treated tubers utilizing compound and plant materials. Additionally, the plant materials utilized were likewise as/more compelling than the substance treatment. In any case, it ought to be noticed that covering the tubers with the plant materials will be viable just for un-plagued tubers and doesn't safeguard tubers that as of now have hatchlings/egg in it. This is on the grounds that the dried slashed leaves of the plants just goes about as repellants and have no insecticidal properties. Subsequently, a different report is important to survey the insecticidal properties of the plant removes. Albeit, successful in controlling potato tuber moth pervasion of tubers away, utilization of synthetic compounds ought not be taken as a drawn out arrangement as a result of the chance of potato creating protection from it whenever utilized regularly and the wellbeing gambles with it postures to customers and makers. Be that as it may, we ought to distinguish different choices, including neighborhood information, alongside involving locally accessible assets in fostering a coordinated way to deal with controlling this bug.

CONCLUSION

This is presumably the most bountiful of the weeds accessible which can be utilized by ranchers. In any case, the control is just successful when utilized on clean tubers and wouldn't be powerful in the event that the tuber is now swarmed or on the other hand assuming the moth has proactively laid the eggs in the tuber. In this way, the significance of controlling potato tuber moth both at the field and capacity level ought to be perceived. Besides, it additionally requires the use of different control parts at various phases of the yield development to keep populace and invasion underneath the edge level.

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