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Incidence of major insect pest on vegetables in Namsai district, Arunachal Pradesh

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Abstract

The incident of major insect pest like shoot and fruit borer on brinjal, Hadda beetle, tobacco caterpillar, Fruit borer and Potato tuber moth in solanacea crops and cabbage butterfly, cabbage aphid, painted bug, diamond back moth and leaf caterpillar in Cole crops were observed in major vegetables crops of Namsai District, Arunachal Pradesh. The aim of this article is to make an effort to assess some important insect pest of solanacea, cole, and other vegetables, their identification, damage and management practices.

Keywords: Insect pests, Namsai district, Arunachal pradesh

Introduction

Arunachal Pradesh is north eastern most state of the country. Agriculture is the main source of earning of Arunachal Pradesh. About 53% of the total cultivated area is under Jhum and the rest under permanent cultivation. Arunachal Pradesh experiences varied agro climatic condition and smooth topography which enables a great vegetables growth as well apart from food crops. 'Vegetables are important part of the world agriculture which constitute a major part of the diet contributing nutrients and vitamins. Vegetables are used as delicious meals and for better health of the family. The amount of vegetables a person needs to eat depends on age, sex and level of physical activity. Vegetables are eaten in a variety of ways, such as a part of main meals and as snacks (Vainio and Bianchini, 2003) ^[1]. Vegetables provide energy, vitamins, minerals and fibre and there is growing evidence of additional health benefits from a range of phytonutrients. The yield per unit area of vegetables is quite low since the insect pests cause 30-40% losses in general and even 100% losses in case of menace if no control measure is applied. A conservative estimate puts about annual yield losses in vegetables at 25% due to insect pests alone (Rahman, 2006) ^[2].

Insect pests are the major biotic constraints to vegetables production in India. Apart from causing direct damage many of them also act as vectors for several viral diseases. The crop losses to the tune of 30-40 per cent have been reported in vegetable crops. The major objectives of this article is to overview on the incident of important insect pest and their identification in major vegetables crops of Namsai, Arunachal Pradesh which are grown without any pesticide treatment. Pest identification is the most important step because misidentification is a common cause of control failure and knowing the correct pest is the key to select control measures that work effectually

Major Insect Pests of Solanaceous Vegetables**Solanaceous Crop****Eggplant Shoot and Fruit Borer, *Leucinodes orbonalis* Guenee (Pyralidae: Lepidoptera)**

This is the most serious pest of eggplant and larvae start infesting eggplant from their very young stage and continue up to the last day of the crop's life. In the vegetative phase of the plant, the larvae bore into the young shoots, petioles and midribs of the large leaves, and feed on the internal tissues from within the attacked plant part. The infested shoots droop down and subsequently wither. In the reproductive phase when the plants start bearing flowers and fruits, the larvae bore into the flower buds and fruits. Larvae emerge from eggs and travel a short distance to bore into new shoots or fruits. The first symptoms of infestation are freshly wilted shoots. Larvae feeding on fruit render them unmarketable. The best way to manage infestations is through good crop sanitation, use of pheromones to trap male moths and judicious

use of insecticides to protect natural predators. Effective sanitation includes cutting, removing and destroying damaged shoots until the final harvest. Crop residues should be uprooted and destroyed to remove eggs and larvae.

Fruit Borer, *Helicoverpa armigera* (Noctuidae: Lepidoptera)

This worm feeds on the marketable portion of each vegetable crops. Larvae bore into the fruit and make them unfit for consumption and marketing. Adult moths are stout with pale-brown or reddish-brown tinge, fore wings are olive-green to pale brown in color with a dark brown circular spot in the center, while hind wings are pale smoky-white with a broad blackish outer border. Freshly hatched larvae are yellowish-white in color, but gradually change and acquire greenish tinge. Full-grown larvae are apple-green in color with whitish and dark-gray broken longitudinal stripes. Many plants including corn, tomato, bean, pepper, okra, and eggplant are attacked by this pest. Collect and destroy the infested fruits and grown up larvae. Grow simultaneously 40 days old American tall marigold and 25 days old tomato seedling at 1:16 rows and Setup pheromone trap with Helilure at 12/ha

Tobacco Caterpillar, *Spodoptera litura* (Noctuidae: Lepidoptera)

The adult moths are stout, pale ochreous suffused with dark-brown and larvae in gregarious form feed inside the infested host. The caterpillars also tunnel into soft tissues such as soft stems, midribs and leaf stalks.

Whitefly, *Bemisia tabaci* (Aleyrodidae: Homoptera)

Adults are tiny, moth-like insects and nymphs are flat, elliptical in shape, and clear or creamy yellowish in color that inhabit undersurfaces of leaves and cause damage by penetrating tissue and removing plant sap with piercing-sucking mouth parts. In general, whiteflies go through an egg stage, four nymphal stages and an adult form, while only the first nymphal stage (crawler) is mobile. Both nymphs and adults feed on leaves and other plant parts particularly problematic on tomatoes, squashes, cucumbers, beans, and other hosts. Direct crop damage occurs when whiteflies feed in plant phloem, remove plant sap and reduce plant vigor. With their high populations, excess sugar (excrement) causes accumulation of honeydew and subsequent growth of sooty mold where plants may die, while some species transmit plant diseases [3].

Major pest of cole crops

Aphid (Aphididae: Homoptera)

Two primary species of aphids attack cole crops; the cabbage aphid and the turnip aphids. Because they are similar in life habits and response to treatments, they will be considered together. Among various insect pests that attack cruciferous vegetable, aphids are the most common pests. The cabbage aphid, *Brevicoryne brassicae* L. (is most abundant from November-December to March-April when it infests various cruciferous oil seed crops and vegetables [4]. It plays a prominent role in reducing the yield ranging from 50 to 80% [5]. Plants in seed beds and at all subsequent stages of their growth are frequently covered with dense clusters of whitish-green plant lice about the size of a pinhead, which suck the sap from the leaf. The affected leaves curl and crinkle or form cups, completely lined with the aphids, and in severe infestations, wilt and die. The plants, if not killed, are dwarfed, grow slowly and form small light heads that are not

marketable. Badly infested plants become covered with a mass of the small soggy aphids, and the dying leaves and plants rapidly decay. Aphids are more troublesome during cool, dry weather. Because these pests are difficult to control, treatments should be applied early. Two or three treatments at five-day intervals may be needed to clean up plants. When two percent of the plants are infested with aphids, an insecticide application should be made with high spray volume and adequate pressure to thoroughly wet foliage. Because of the waxy powder that covers the bodies of the aphids and the tendency of leaves to form pockets or cups which protect aphids, it is essential to add spreader-stickers to the spray mix. Destroy old stalks of cabbage as soon as the crop is harvested to help prevent destructive outbreaks of these aphids. Aphids can be heavily attacked by several natural enemies. Parasitic wasps are perhaps the most conspicuous of these, causing aphids to swell and stick to plants when dead, a form known as an 'aphid mummy'. General predators include larvae of syrphid (flower) flies, damsel bugs, and minute pirate bugs. Green lacewing larvae and lady beetles also feed on aphids, although cabbage aphid is not a preferred host.

Cut worms (Noctuidae: Lepidoptera)

There are several species of cutworms and many of which overwinter in the soil as partially grown larvae. They have a very wide host range and can damage almost all vegetable crops, weedy vegetation, and young seedlings are especially vulnerable. The caterpillars are brown or black, herring-boned and hairless. They can be found in the soil surrounding the plant and curl up from mouth to tail when disturbed. The caterpillar pupates in the soil and emerges as a medium-sized, grey-bodied moth with dark wings. Cutworms may be active throughout the year, but the autumn and more especially the spring generations, cause the most damage, attack young transplants and newly emerged seedlings. Cutworm caterpillars eat plant's stem, and sometimes cut the stem of young transplants and newly emerged seedlings. Because transplants are more costly and are planted at lower densities, the potential for serious damage is higher for the transplants than for direct seeded plants. As plants grow larger, they become less susceptible to cutworm injury.

Diamond back moth *Plutella xylostella* (Plutellidae: Lepidoptera)

The diamondback moth is the most destructive insect pest of brassica crops throughout the world. Diamondback moth eggs are oval and flattened, and measure 0.44 mm long and 0.26 mm wide. Eggs are yellow or pale green in color, and are deposited singly or in small groups of two to eight eggs in depressions on the surface of foliage, or occasionally on other plant parts. The diamondback moth has four instars. The larvae are colorless in the first instar, but thereafter are green. The body bears relatively few hairs, which are short in length, and most are marked by the presence of small white patches. There are five pairs of prolegs. Initially, the feeding habit of first instar larvae is leaf mining, although they are so small that the mines are difficult to notice. The larvae emerge from their mines at the conclusion of the first instar, molt beneath the leaf, and thereafter feed on the lower surface of the leaf. Their chewing results in irregular patches of damage, and the upper leaf epidermis is often left intact. Pupation occurs in a loose silk cocoon, usually formed on the lower or outer leaves. In cauliflower and broccoli, pupation may occur in the

florets. The yellowish pupa is 7 to 9 mm in length. The duration of the cocoon averages about 8.5 days (range five to 15 days). Plant damage is caused by larval feeding. Although the larvae are very small, they can be quite numerous, resulting in complete removal of foliar tissue except for the leaf veins. This is particularly damaging to seedlings, and may disrupt head formation in cabbage, broccoli, and cauliflower. The presence of larvae in florets can result in complete rejection of produce, even if the level of plant tissue removal is insignificant. Normally, the diamondback moth takes about 32 days to develop from egg to adult. However, the time to complete a generation may vary from 21 to 51 days depending on weather and food conditions. There may

be several generations per growing season. Generations usually overlap and all four life stages including egg, larva, pupa and adult may be present in the field at the same time. Adult females lay an average of 160 eggs during their life span of about 16 days. Egg laying occurs at night. The greatest number of eggs is laid the first night after emergence and egg laying continues for about 10 days. Diamondback moth eggs are laid mainly on upper leaf surfaces^[6]. and hatch in four to eight days. Eggs are oval, yellowish-white and tiny. They are glued to the upper and lower leaf surfaces singly or in groups of two or three, usually along the veins or where the leaf surface is uneven.

Table 1: Major insect pest of solanaceous and cruciferous crops in Namsai District.

S.No	Family	Vegetable Name	Insect Pest Name	Scientific Name	
1	Solanaceous	Tomato	Tobacco Caterpillar	<i>Spodoptera litura</i>	
			Fruit Borer	<i>Helicoverpa armigera</i>	
		Brinjal	Fruit and Shoot borer	<i>Empoasca devastans</i>	
			Tobacco Caterpillar	<i>Spodoptera litura</i>	
			Fruit Borer	<i>Helicoverpa armigera</i>	
		Chilli and Capsicum	White Fly	<i>Bemisia tabaci</i>	
			Fruit Borer	<i>Helicoverpa armigera</i>	
		Potato			
			Potato tuber moth	<i>Gnorimoschema operculella</i>	
		2	Cole Crops: Cruciferous	Cabbage	Diamond-back moth
Cabbage aphid	<i>Brevicoryne brassicae</i>				
Cauliflower	Cut worms			<i>Agrotis ipsilon</i>	
	Diamond-back moth			<i>Plutella xylostella</i>	
	Cabbage aphid			<i>Brevicoryne brassicae</i>	
3.	Broccoli			Cut worms	<i>Agrotis ipsilon</i>
				Diamond-back moth	<i>Plutella xylostella</i>
		Cabbage aphid	<i>Brevicoryne brassicae</i>		
		Cut worms	<i>Agrotis ipsilon</i>		

Conclusion

Vegetable production is a year-round activity in the Namsai district of Arunachal Pradesh. Pests and diseases are important constraints to vegetable production. Knowledge of crop diseases constitutes a major obstacle in vegetable production systems. The findings of the study would be helpful to understand the constraints faced by the farmers in adoption of recommended Management Practices of major Insect-Pests of solanacea and cole crops

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References

- Vainio H, Bianchini F. Fruits and vegetables. Handbooks of Cancer Prevention, the International Agency for Research on Cancer (IARC). Lyon, France: IARC Press: 2003, 8
- Rahman MM. Vegetable IPM in Bangladesh, In: E. B. Radcliffe and W. D. Hutchison [Eds.]. Radcliffe's IPM world textbook. University of Minnesota, St. Paul, MN. USA, 2006.
- Muhammad Sarwar. Some Insect Pests (Arthropoda: Insecta) Of Summer Vegetables, Their Identification, Occurrence, Damage and Adoption of Management Practices. International Journal of Sustainable Agricultural Research. 2014; 1(4):108-117

- Atwal AS. Agricultural Pests of India and South East Asia. Kalyani Publishers, Delhi, 1976, 502
- Khan AR, Munir M. Rapeseed and Mustard Family Problems and Prospects: Proceedings of National Seminar on Oilseed Research and Development in Pakistan. Agricultural Research Council, Islamabad, Pakistan, 1986, 95.
- Justus KA, Dossall LM, Mitchell BK. Oviposition by *Plutella xylostella* (Lepidoptera: Plutellidae) and effect of phylloclade waxiness. J. Econ. Ent. 2000; 93:1152-1159