SHORT COMMUNICATION

PROBING BEHAVIOUR OF *NILAPARVATA LUGENS* (STAL.) ON RICE PLANT AS INFLUENCED BY POTASH APPLICATION

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Abstract: Rice is an important cereal crop of the world which is known to be attacked by several insect pest during its different development stages out of these brown plant hopper *(Nilaparvata.lugens*) is an important insect pest of rice. The main approach for the management of this pest has been through the chemical methods which has resulted several problems; therefore the fertilizer components affecting the biophysical parameters of the host ultimately influencing the probing behaviour of BPH (*N.lugens*) was thrust point of investigation. In present study the major components of fertilizer viz., nitrogen was tested at 0, 40, 60, 100, 160, 220, 280, 340, 400 and 460 kg/ha and its impact on the probing behaviour of *N.lugens* was recorded. There was significant negative correlationship (r =0.99) between probe marks and nitrogen doses. The regression equations for probe marks in relation to different nitrogen levels applied was = 0.0324x + 4.9589.

Keywords: *Nilaparvata lugens*, paddy, probing behaviour, brown plant hopper

INTRODUCTION

Rice (*Oryza sativa*) is a main cereal crop cultivated on an area of 44 million ha in India having production of about 93 million tones. In Chhattisgarh state, rice is grown in 34.69 lakh hectares with the production of 28.862 lakh tones during 2002-03, which is 8.15% of total area and 3.70% of total production in country (ANONYMOUS, 2003). Among the various insect pests, brown plant hopper of rice is major one with greater economic significance causing extensive losses to paddy crop up to 34.40% in Chhattisgarh (GANGRADE *et al*., 1978). Several attempts had been done in past and present scenario by using several chemicals but due to ignorance and lack of techniques know how, the result did not come up to expectation more over, several after use of these chemical problems had been noted. It has been reported that close planting production of more tillers per unit area, increased use of fertilizers indiscriminate plant protection measures were reported to have increased behavior and its abundance (KALODE, 1974, 1976 AND OKA, 1977). Non judicious uses of fertilizers suppose to cause many problems of the insect pest as well as more use of organic matter may give rise the problem of brown plant hopper (*N.lugens*). Therefore, to work out the impact of macronutrient on the probing capacity of brown plant hopper *(N.lugens*), which could give a clue for its better management, is the aim of framing this piece of investigation at the lab level.

MATERIAL AND METHOD

The experiments were carried out at glass house department of Entomology, college of Agriculture IGKV, Raipur during the period of March-2007 to june-2007. The brown plant hopper, *Nilaparvata lugens* (Stal.) initially collected from entomological field and its culture being maintained throughout the year in the air-cooled glass house, Department of Entomology at $30^{o}c\pm5^{0}c$ on potted TN1 variety. BPH (*N.lugens*) were reared on 40 to 45 days old potted TN1 plant inside the rearing cage of 75x75x75 cm size consisting of wooden frame. Potted TN1 plants were placed inside the rearing cage for egg laying along with at least 60 pairs of BPH per pot. After 23 days the female starts egg laying inside the leaf sheath of paddy plants. For determination of soil fertility status initially soil samples were collected from Entomological field at the two depth (0 to 15 cm and subsurface 15-30 cm). Available nitrogen was determined by alkaline permagnet methods, phosphorus was determined by Olsen extract method and potash was determined by Flame photometric method for preparation of pots the pots were filled with the soil which was already assessed for fertility gradient, then light sprinkle of water given to pots containing soils. First of all potash was conducted for which fixed amount of phosphorus (P) was thoroughly mixed into the soil and nitrogen (N) was mixed into two split doses into the soil and different amount of potash viz; 0, 40, 100, 160, 220, 280, 340, 400 and 460 kg/ha was provided thoroughly into the soil.

For testing of probing behaviour of BPH different fertilizer application seeds of identified susceptible variety TN1 germinated separately in petridishes. Germinated seeds were sown into wooden trays containing well-puddled soil. After seven days it was transferred into individual pots two days old female was introduced into each test tube and allowed to make punctures on the seedling for 24 hours. Test tubes were plugged with sterilized cotton swab. There after the seedlings were taken for staining in another tube 1.0% erythrosine dye aqueous solution. Insects probing marks were counted visually after 30 minutes of staining (NAITO, 1964).

RESULT AND DISCUSSION

Three replicates were used for each treatment and each treatment were repeated three times. The result obtained due to experiment are as it can be seen from table-1 (D1) that an average probing mark by *N.lugens* was significantly the lowest (4) in the least potash (0 kg/ha) applied pot; while the maximum number of average probe marks i.e., 19 was recorded on the highest potash (460 kg/ha) levels. There was a increasing trend of average probing mark behaviour with the increase in potash level. And it is crystal clear from table-2 that there is straight line positive correlationship could be established between different levels of potash and average probing mark and correlation coefficient worked out was 0.99, the regression equation is like that y = 0.324x+4.9589 and the coefficient of determination was found 0.99.

Influence of different potash levels for the probing behaviour of *N.lugens* on paddy was studied as it is clear from the tables (1-2) that the probes were reducing down in number with decrease in different potash levels. In general there was positive correlationship between these two variables studied. Probably, the reason behind this may be due to variation in different biochemical factors. Which may be ultimately influenced and governed by macro and micronutrient of fertilizer uptake. The application of potash imparts disease resistance; produces strong stiff straw especially in paddy and wheat. Potash also regulates osmoregulation and stomatal movement and actsas food farmer sugar and starch transporter, protein builder and a disease retarder (KATYAYAN, 2004).Therefore, the more number of probes made by *N.lugens* on the plant having higher potash application and vice versa was there with lower potash application inferring that the excess potash level had provided stiff morphological attributes of the host plant.

Table 1: Influence of different potash level on the probing behaviour of *Nilaparvata lugens* on paddy during march-2007 to june-2007.

S.NO.	Treatments Potash (Kg/ha)	Mean probing mark in 24 hours by *N.lugens*				Overall average Probing mark
		D1	D2	D3	D4	
1.	T1-O	3.00	3.00	6.00	7.00	4.75
2.	T2-40	5.00	4.00	7.00	9.00	6.25
3.	T3-100	6.00	7.00	9.00	10.00	8.00
4.	T4-160	10.67	8.00	11.00	13.00	10.67
5.	T5-220	11.00	12.00	12.00	14.00	12.25
6.	T6-280	12.00	13.00	15.00	16.00	14.00
7.	T7-340	13.33	17.00	16.00	17.00	15.83
8.	T8-400	16.00	18.00	19.00	19.00	18.00
9.	T9-460	19.00	19.00	21.00	20.00	19.75
	SEm±	1.17	1.48	1.56	1.80	2.67
	CD (p=0.05)	3.46	4.49	4.65	5.33	7.94

D1 = Planted between 07.03.07 to 18.03.07
D2 = Planted between 21.03.07 to 01.04.07
D3 = Planted between 23.05.07 to 02.06.07
D4 = Planted between 03.06.07 to 14.06.07

Table 2: Association between probing behaviour of *Nilaparvata lugens* and different dose of potash.

S.No.	Different planting dates	Correlation coefficient (r)	Regression equation (Y)	Coefficient of determination (R^2)
1	D1	0.98	-0.0408x+23.071	-0.96
2	D2	0.99	0.0327x+3.0748	0.99
3	D3	0.99	0.372x+2.951	0.98
4	D4	0.99	0.324x+5.6853	0.99
	Overall average	0.99	0.0324x+4.9589	0.99

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