

Sustainable Bio Control Method Against Major Sucking pest mites, Pyrilla and borers for Enhancing sugar cane (*Saccharum officinarum*) yield and quality.

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Abstract:

Sugar cane is the cash crop in Pakistan. crop usually affected by insect pest and disease . Among these insect pests in sugarcane, pirylla and mites are very dangerous, where as Pyrilla and mites are very serious pests in sugar cane. crysopyrilla. (Hymenoptera: Pyralidae) is prominent egg parasitoid utilized for the purpose of pyrilla infestation in IPM. This research was carried-out for the purpose of success various issuance of crysopyrilla in case of sugarcane Pyrilla attacks and observe the decay rate of sugarcane pest and such as control issuance by crysopyrilla eggs cards. The pirylla ' generation emerges out after 27 days, crysopyrilla cards carnea were installed with the duration after 10 15, 20, days interval repeated and to check out infestation of sugar cane sucking insects . The research shows that results of installed crop was excellent minimum pyrilla infestation as compared to less installed crysopyrilla card . More treated with crysopyrilla card about 2400 parasitoids eggs /acre at interval after 20 days repeat 7-8 times from May to September. While pirylla complete their life cycle 20 -25 days. To increase the quality about 0.2-0.5 in sugarcane recovery and more than 150 -200 mound per acre increases due to application of crysopyrilla cards. Whole minimum to high amount of crysopyrilla cards T3 4800 parasitoids eggs/acre growth was 42.07 note max high yield 35.51 ton/ha and more brix 20.1 were seen. The results showed that crysopirilla eggs card is successful and inexpensive and environmental safe recruitment for complete dominating over sugarcane Pyrilla.

Introduction

Agriculture is basic needs of human and strongly courage used in many departments ([Praburaj, 2018](#))The contribution of agriculture about 3,4 trillion us dollar and source of job opportunity 1.3 billion worker in the world ([Alston and Pardey, 2014](#)). Agriculture gives more values in GDP ([Freire, 2014](#)).Indeed more farming of agriculture have many problems such as irrigation, natural rsistences,pest and diseases, ([Makal et al., 2017](#)). Pest and disease loss the quality of food as decrease the production of crop. Fluctuation in weather pest are transfer to new suitable weather situation. ([FAO, 2017](#)). Mites have many group of insects which have been damaging and disastrous agriculture economic for various years. Recognize in class Arachnida, subclass Acari and families Tenuipalpidae, Tarsonemidae, Tetranychidae and Eriophyidae ([Baker and Wharton, 1958](#)). Mites extract acute from leaves cell with their mouthparts and stinging crop juice ([Bensoussan et al., 2016](#)). Identification mites attack normally yellow or whitish cloure appear on the leavers tissues and make tiny traps. (Jeppson et al., 1975).By spider mites results in decrease in production. ([Arnemann et al., 2006](#)). Identification of white and yellow patches appear on leaves surface and acute attack decrease in yield production([Dehghan et al., 2009](#)). More than 70 percent decrease in yield due

to red mites that is spread in in Martinique, Antilles islands and Trinidad ([Rodrigues et al., 2020](#)). Spider mites effects on production of crop about 50% [Maina et al., 2014](#) ([Maina et al., 2014](#)). [Renkema et al., \(2017\)](#). More attack of mites in large scale that is immediately stop the growth of crop whites and yellowing of each plot young leaves [Yong-Heon \(2002\)](#). Research identified that due to repetition of pesticides were made more resistivity against all types of miticides. Mites control is not easy due to more fecundity rate and high growth rate of mites ([Yong-Heon, 2002](#)). Pest management is practice by pesticides which cause effect on climate; health .More effective method is biological control ([Tudi et al., 2021](#); [Gangwar, 2017](#)). Chemical spray contaminate climate, air, water and soil as well as decrease the nitrogen fixation ([Mahmood, 2016](#)). About 98% spray insecticides and 95% of herbicides effect on non targets organism ([Miller, 2004](#); [Follet and Duan, 2000](#); [Robinson et al., 1999](#)).

Materials and Methods

Trial area of 1.944 hectare sugar cane variety was cp 77400 sow 36 plots every plot has equal size 0.036 hectares in complete randomize block design (CRBD) implements in this experiment. Three treatments were taken on single plot T1, 4000 trichogramma eggs parasitoids per acre were installed four times and T2, 6000 trichogramma parasitoids eggs per acre were installed six times and treated with Chrysoperla cards 720 parasitoids eggs per acre were installed four times and 1440 parasitoids eggs per acre were installed six times in same plot by evaluating less parasitoid eggs from month April to August 2025, therefore sugar cane production and brix was noted at the time of harvesting. All the agronomic practices recommended dose of fertilizer and irrigation were apply according to the condition of crop. Insecticide s were not used in the crop. The infestation level of sucking pest and borers were measure affected crop from month April to September after interval 15, 20 days. Select 5 different places from one plot with in 10 squares meters note the damage plants and calculate the percentage of affected plants. To reduce the borers attack as well as sucking attack was rare on fictitious host on boiling wheat a little tiny moth *citotroga cerelella* in the laboratory of Hamaza sugar Mills Jeatha Bhutta Khan Pur below temperature $25 \pm 2^{\circ}\text{C}$ and humidity 60-70%. Stored parasitoid cards available for grower installed in the sugar cane crop as bio control agent. Installation of trichogramma and Chrysoperla cards at different duration must raise generaion to more amount of eggs parasitods cards.

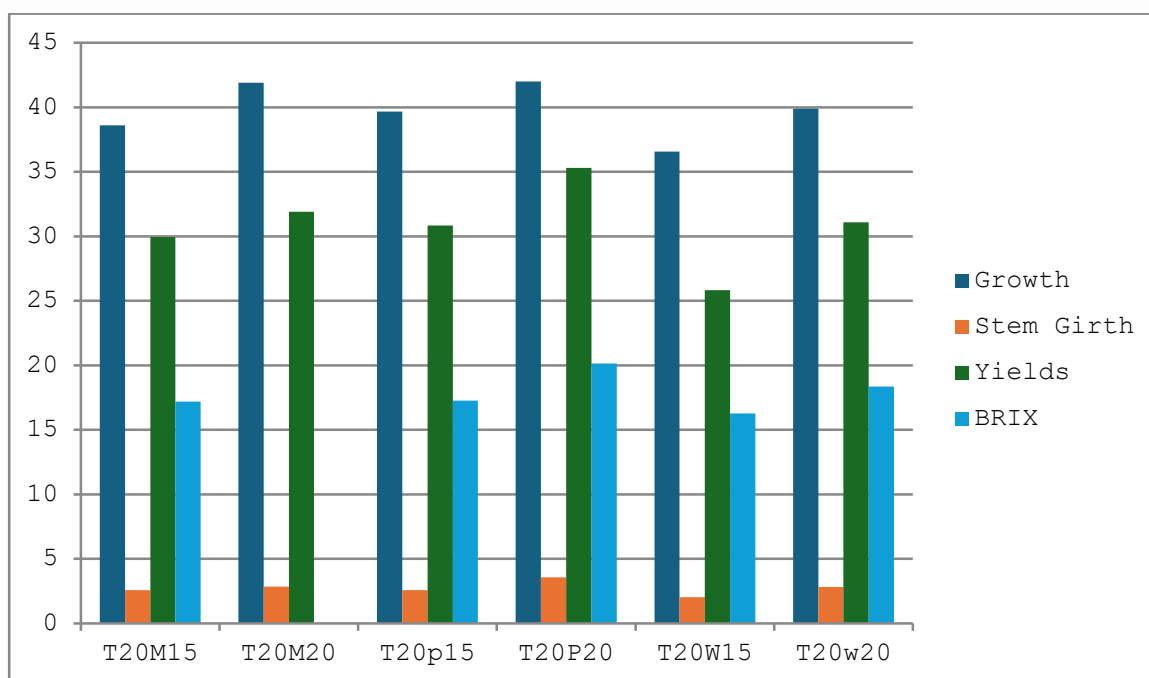
Results and Discussion

Sugar cane is long duration crop total expenses are more by the farmer on single highest expenses in the whole development. The installation of biological process is cheap, easy method and The adaptation of biological process is a cheap and 90% save cast in trichogramma cards not a labors, 90-95% control to reduce the borers infestation .The farmers of Pakistan are using conventional method to control borers attack and research indicates that for getting high quantity and recovery modern technique method must be applied ([Radadia et al., 2013](#)). However treatment with trchogramma cards control all the borers attack ([Sallaman and Allosopp, 2005](#)). This research was organized to describe the impact of trichogramma cards on growth, yield and quality of sugar cane at different intervals 10, 15, 20 times. There was very important and most effective control of borers.

Decrease infestation of bores was installed rate of trichogramma cards. It is very suitable and successful bio control against sugar cane borers. The highest and lowest installation was recorded in the minimum and maximum emerge out of trichogramma cards with 10 and 20 days duration as mentioned. There is a great difference were seen in borers attack as comparing to control and installed block. The decrease of borer's infestation was due to emerge out of trichogramma *chilonis* cards. There was a great dissimilarity of lower and more trichogramma cards, the highest cards were installed dose of 60000 parasitoids eggs /acre cards

There was a significant consequence of biological control agent against borer attack during whole study. The maximum and minimum release of trichogramma cards after 10, 20 days interval respectively. There was a significance difference was seen between lowest and highest trichogramma card treated

The lowest borer infestation was determined based on the amount of trichogramma cards eggs at maximum 40000, 60000 parasitoids eggs/acre. Table shows that more significantly ($p < 0.01$) of borers damage. In the month of May data was collected in treatment T1 growth was 20.97 and yield was 17.754 ton / acre brix was minimum 12.3.



Conclusion:

This is a very paramount method to decrease harmful insects by biological method. Very less expensive and suitable techniques to damage insets from plants. Beneficial insects or bio agent’s remains live for a long duration in the agriculture field. The seasonal crops natural envornmently favor bio pesticides and bring optimistic climate for beneficial bio control. The chief and basic techniques in biological control of sugarcane insect should be food of natural bio agents’ method.

Results and discussion

Effect of

Treatment	Mites 20 cards crysopyrilla	Pyrilla 20 cards crysopyrilla	White fly 20 cards crysopyrilla	
Trichogramma 10 cards				
Trichogramma 15 cards				
Trichogramma 20 cards				

Treatme nts	Trichogra ma cards	Trichogra ma+	Trichogra ma+	Trichogra ma+	Trichogra ma+	Trichogra ma+

	+chrysopa cards for mites T15 M15	chrysopa cards for mites T15M20	chrysopa cards for pyrilla T15 P15	chrysopa cards for pyrilla T15P20	chrysopa cards for White fly T15W15	chrysopa cards for White fly T15P20
GROWTH	T15 M15	T1M20	T15 P15	T15P20	T15W15	T15P20
STEM GIRTH	T20M15	T20M20	T20 P15	T120P20	T20W15	T20P20
YIELD						
BRIX						

Table 1:Trichogramma cards treatments with 15 days interval cards and chrysopa cards to control sucking pest and borers.

TREATMENTS	Growth	Stem Girth	Yields	BRIX
Trichogramma cards +chrysopa cards for mites T15 M15	24	2.47	25.29	10.51
T1M20 Trichogramma+ chrysopa cards for mites	34.50	2.83	33.56	13.23
Trichogramma+ chrysopa cards for pyrilla T15 P15	30.61	2.47	26.	10.67
Trichogramma+ chrysopa cards for pyrilla T15P20	34.74	3.57	33.65	14.50
Trichogramma+ chrysopa cards for White fly T15W15	25.74	2.03	23.37	9.54
Trichogramma+ chrysopa cards for White fly T15P20	34.40	2.57	32.85	11.38

Graph 1:Trichogramma cards treatments with 15 days interval cards and chrysopa cards to control sucking pest and borers.

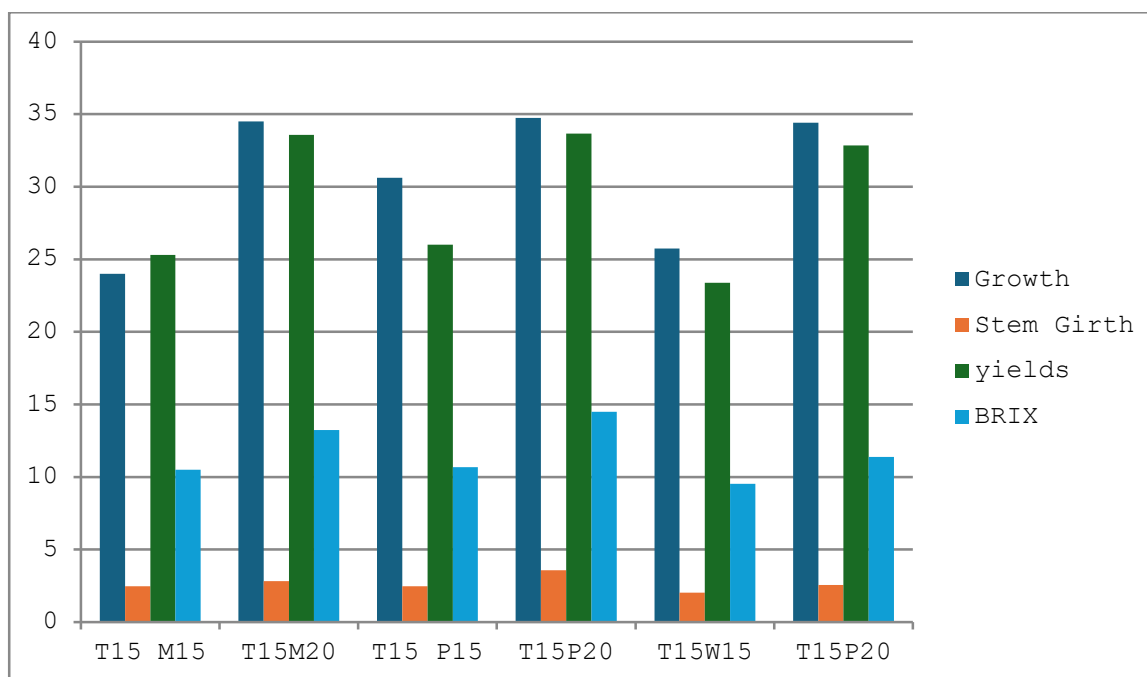
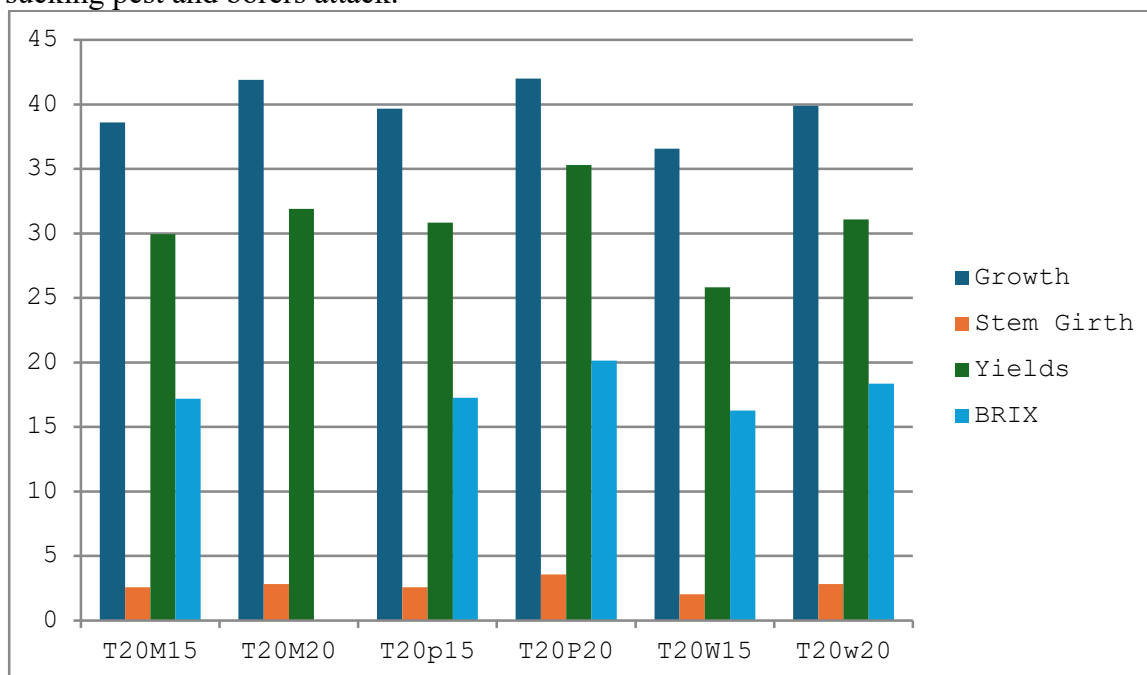


Table 2 :Trichogramma cards treatments with 20 cards and chrysopa cards to control sucking pest and borers attack.

TREATMENTS	Growth	Stem Girth	Yields	BRIX
Trichogramma cards +chrysopa cards for mites T20M15	38.60	2.57	29.96	17.20
Trichogramma+ chrysopa cards for mites T20M20	41.91	2.84	31.90	18.36
Trichogramma+ chrysopa cards for pyrilla T20p15	39.67	2.57	30.84	17.27
Trichogramma+ chrysopa cards for pyrilla T20P20	42	3.57	35.32	20.15
Trichogramma+ chrysopa cards for White fly T20W15	36.58	2.03	25.84	16.27
Trichogramma+ chrysopa cards for White fly T20w20	39.91	2.83	31.09	18.36

Graph 2 : Trichogramma cards treatments with 20 cards and Chrysoperla cards to control sucking pest and borers attack.



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