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Effect of different insecticides application on the lint quality of cotton

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Abstract
Laboratory studies were carried out on four insecticides Confidor, Polo, Proclaim and Deltaphose on lint quality characters of cotton. Cotton was harvested three times and lint of every picking was analyzed separately. Results showed that there was no significant effect of insecticides on lint quality characters such as micronair, fibre maturity, staple length fibre strength, seed index GOT and seed germination. First picking seeds had the overall germination percentage of 63.44 followed by second and third as 35.2 and 34.7%, respectively. There was no significant effect of the first two factors, whereas, the third factor, that is, picking time significantly (F=11.35; DF2, 78 P<0.0001) affected the cotton fibre strength. However, the time of harvesting significantly (P<0.001) affected almost all parameters of lint quality mentioned above. The highest values were recorded on first harvest of crops.

Keywords: Cotton, insecticides, fertilizers, characteristics

1. Introduction
Cotton, *Gossypium hirsutum* L, is the most important fibre crop of Pakistan and the world. Today cotton is produced in many parts of the world. In 2006, the largest growers in descending order of production were: China, India, the United States, Pakistan, Uzbekistan, Brazil, and Turkey (USDA, 2006). Cotton is a unique agricultural crop that provides both food and fiber, it is one of the most important textile fibres accounting for about 40% of all textile use and more than half of all the fibres used in clothing and furnishing industries. The by-products of its seed provide edible oil for human consumption, soap and high protein animal feed [1]. According to [2], branching of the main stem of cotton occurs initially from auxiliary buds of the main stem leaves generally referred to as main stem nodes giving rise to vegetative or monopodial and fruiting or sympodial branches. Below a certain point on the main stem the branches are monopodial, and above that point they are sympodial [3]. Vegetative branches just like the main stems have got one meristem they therefore grow straight and erect and do not bear flowers directly, but produce fruiting branches which do. Fruiting branches on the other hand have multiple meristems and have a zigzag growth habit they terminate at each node with a flower bud, and a lateral branch, which repeats the process [4].
Many factors such as; length of growing season, climate (including solar radiation, temperature, light, wind, rainfall), variety, soil fertility, pests and cultural practices affect cotton growth [5]. Cotton in Kenya is grown in a wide range of soil types and in areas ranging from sea level to about 1400 meters above sea level with annual mean temperatures ranging from 21°C to 24°C [6]. The extended vegetative growth period tends to enhance fibre immaturity, reduce lint development and also increases costs of production by increasing the number of weeding and sprays and the length of time crop is on the farm [7]. Cotton plant requires about 500 to 700 mm of rainfall during the growing season with about 80% or more of this being required at the flowering to maturity period. Both excess and insufficient soil moisture is both known to cause fruit shed [8]. Present study was carried out to investigate the effect of insecticides on damage compensation cotton crop caused by different insect pests at cotton section. Insecticides confidor, Polo is used for controlling the (sucking pests) Proclaim & Deltaphos were used against bollworms. Such studies helped in understanding the effect of insecticides in increasing cotton yield and its quality characters.

2. Materials and Method
The field experiment plant damage compensation and cotton lint quality characteristic was conducted in the field of Cotton Section, Agricultural Research Institute (ARI), Tandojam.

Cotton plant damage was simulated by artificially removing cotton leaves and fruiting bodies. Four insecticides used in this study Confidor, Polo, Deltaphose and Proclaim from September to December, 2017.

T1 = Natural control.
T2 = 12 percent leaves + fruiting bodies removed.
T3 = 22 percent leaves + fruiting bodies removed.
T4 = 32 percent leaves + fruiting bodies removed.
T5 = 42 percent leaves + fruiting bodies removed.
T6 = 52 percent leaves + fruiting bodies removed.
T7 = treated control, in which plant growth regulators were applied.

2.1 Collection of Samples
Insecticides lint sample for different treatments were collected separately, samples were properly labeled and stored before carrying out lint quality tests. Cotton was harvested (picked) three times and lint of every picking was analyzed (picked) three times and lint of every picking was analyzed separately. The following tests were carried out.

2.2 Ginning
After weighing the samples, ginning was carried out for the separation of the lint and seeds from seed cotton on ginning machine.

2.3 Seed index (g)
For determination of seed index, 100 cotton seeds were collected at random and weighed on an electrical balance (Sartorious 200s model).

2.3 GOT %age
Ginning out turn %age was calculated for every sample of seed cotton with the formula.

2.4 Fibre Strength ("000" lbs/sq.inch)
The apparatus used for fibre strength was Pressely Fibre Strength Tester Model No.2203. Fibre strength was determined with the help of a sample of known strength (cotton standard sample). The standard sample of known value (89.2) was received from Pakistan Institute of Cotton Research and Technology (PCCC Karachi).

2.5 Staple length
First of all, samples were separated with the help of fibre sampler (192 model) and combs were filled then these combs were inserted into Fibrograph (530 model). It showed the readings in millimeters the reading was taken for five times and mean value of the readings was calculated as the staple length.

2.6 Micronair/fineness
First of all the lint sample was cleaned to separate the waste material with the help of Shirly Analyzer Electrical Apparatus then the lint sample was weighed on Sartorius electrical balance (3.24 g). The weighed lint sample was put into porous chamber of Sheffield micronaire, and then the air pressure was released to flow through the lint sample, the float moved upward and showed the reading on the scale.

2.7 Fibre maturity percentage
Two reading were obtained from Sheffield Micronaire Apparatus. First reading taken with plunger one and the second reading with plunger two on the left side of scale was reading RI and on right side of scale was reading R2.

2.8 Seed germination
Trays filled with sandy soil were given water sufficient for germination. Cotton seeds (100) were sown in each tray and trays were placed in a seed germinator/incubator under controlled temperature (21°C – 34°C). After 10-12 days observation were taken and the germinated seeds were recorded and seed germination percentage calculated with the following

3. Result

3.1 Effect of insecticides on lint quality characters
Table & Figure 1 shows that there was no significant effect of removal of leaves and fruiting bodies on germination of seed. However, picking time had highly significant (F=60.80; DF=2, 78; P<0.0001) effect on germination, first picking seeds has the overall germination percentage of 63.44 followed by second and third as 35.2 and 34.7%, respectively. However, Seed index recorded time of picking had a highly significant (F=135.04; DF=2, 78; P<0.0001). On the other hand, the maximum seed index 8.01 grams per 100 seed was recorded of first picking followed by second and third picking as 6.64 and 6.08 grams per 100 seeds, respectively. Another parameter Micronair of cotton fibre was not significantly affected by either damage simulation or application of insecticides. However, it was significantly affected by the time of picking (F=9.55; DF=2, 78; P<0.001) and the highest micronair was obtained for second picking (4.55) followed by third (4.37) and the first picking (4.34).

The results about fibre maturity indicated that there was no significant effect of removal of leaves and fruiting bodies. The staple length of cotton fibre in the present study was not off significantly affected due to either damage simulation or application of pesticides. The significantly (F=21.30; DF=2,78; P<0.0001) higher sample length of cotton fibre was obtained from cotton harvested during second picking (33.67 mm) followed by first and third picking with the values of 32.63 and 32.54 mm, respectively. There was no significant effect of the first two factors, whereas, the third factor, that is, picking time significantly (F=11.35; DF2, 78 P<0.0001) affected the cotton fibre strength. The highest strength was obtained in cotton of first picking (88.91) followed by second and third picking with value by 88.54 and 86.97. The Ginning out turn of cotton showing in the present study damage simulation and application of insecticides had no significant effect; whereas, the time of harvesting significantly (F=166.43; DF=2, 52 P<0.001) affected the GOT. The maximum GOT (38.72) was obtained from third harvesting followed second and third with 34.17 and 33.17 respectively.

4. Discussion

In the present study no significant effect of application of insecticides were found on lint quality characters. However, time of harvesting significantly affected lint quality characters in the present study. There are many studies reported which said that application of insecticides had some effect on lint quality, [9] conducted on cotton using different doses of insecticides, reported that fibre quality and lint percentage were affected by the treatments. [10] Studied eight cotton genotypes to determine the effect of insecticides on lint yield and quality. Whereas, the present study showed that there was no significant effect of damage simulation (removal of fruiting bodies and leaves) insecticides on seed index, fire

maturity, and staple length seed germination fibre strength and micronair but the time of harvesting (picking) significantly affected lint quality characters. Some other studies were reported where application of insecticides had increased the lint yield of cotton compared with control such as, [11] reported that insecticide treated plots had significantly more lint yield than none treated plants. [12] Compared new insecticide, thiamethoxam with aldicarb and imidadoprid for efficacy against thrips on cotton and yield. Lint yield at first harvested was higher in the highest rate of thiamathoxam treatment compared to temik and untreated. Total lint yield did not differ among insecticide treatments respectively.

Table 1: Effect of artificial damage simulation of insecticides and two time of picking on Seed germination, Seed index, Micronair, Fibre maturity, Staple length, Fibre strength and Ginning out turn of cotton.

Picking	Insecticides	Treatments	Seed Germination %	Seed Index %	Micronair Value (µg/inch)	Fibre Maturity %	Staple Length (mm)	Fibre Strength %	G.O.T %
1	Confidor	T1	63.3	8.03	4.26	96.9	32.31	87.51	34.03
		T2	65.3	7.15	4.2	87.6	32.89	8.01	35.34
		T3	62.6	7.58	4.16	87.2	32.71	85.94	34.81
		T4	66.6	8.13	4.3	87.43	32.19	90.52	31.73
		T5	66.0	8.47	4.56	85.9	32.24	91.03	32.27
		T6	63.3	7.28	4.16	86.6	31.47	89.87	32.79
		T7	54.6	8.38	4.53	85.9	33.28	89.34	32.83
	Polo	T1	37.3	7.94	4.43	84.3	33.49	87.87	32.31
		T2	74.6	8.63	4.9	87.4	32.89	89.41	32.67
		T3	69.3	7.95	4.3	85.9	32.63	86.99	30.29
		T4	74.6	7.25	3.9	87.13	32.94	92.19	32.34
		T5	73.3	9.64	4.36	86.2	32.36	82.51	32.86
		T6	60.0	7.77	4.03	84.5	32.05	90.87	31.82
		T7	48.0	7.91	4.53	87.8	33.51	88.45	33.83
	Deltaphose	T1	46.6	8.12	4.53	90.3	32.73	88.86	32.58
		T2	41.3	8.21	4.3	86.6	31.46	89.92	32.82
		T3	46.6	7.22	4.16	87.06	32.81	88.47	33.22
		T4	76.0	8.34	4.7	87.5	32.93	87.94	33.40
		T5	53.3	7.97	4.16	87.7	33.03	88.75	32.03
		T6	80.0	8.14	4.40	88.4	32.34	86.22	31.94
		T7	86.6	7.93	4.5	88.3	32.97	91.41	33.48
	Proclaim	T1	48.0	7.95	4.2	89.4	31.12	89.4	32.22
		T2	74.6	8.25	4.5	84.6	32.97	91.12	33.49
		T3	57.3	7.48	4.06	87.0	32.75	87.62	32.25
		T4	86.0	8.8	4.23	88.4	33.0	88.49	33.10
		T5	71.3	7.43	4.06	87.06	32.63	92.13	32.75
		T6	60.0	7.92	4.26	86.2	33.02	88.6	34.10
		T7	60.0	8.47	4.3	84.8	32.97	91.08	32.61
2	Confidor	T1	30.6	68.1	4.5	86.1	33.86	89.64	33.87
		T2	32.0	6.53	4.66	88.6	34.07	89.04	33.18
		T3	28.0	6.71	4.6	88.5	35.18	86.77	38.74
		T4	44.0	7.02	4.56	87.6	34.18	87.89	34.46
		T5	33.3	7.15	4.4	86.5	35.15	87.84	32.72
		T6	49.3	7.39	4.53	87.0	33.56	88.08	31,03
		T7	29.3	6.35	4.26	87.0	33.64	88.09	35.85
	Polo	T1	37.3	7.17	4.63	88.06	33.1	87.66	35.86
		T2	32.0	6.44	4.76	88.3	34.03	87.71	33.51
		T3	32.0	6.25	4.33	87.1	33.64	91.14	37.99
		T4	26.6	6.79	4.53	88.8	33.87	89.42	33.81
		T5	36.0	6.21	4.63	88.03	33.64	88.62	33.32
		T6	28.0	6.14	4.3	85.9	33.28	88.19	34.14
		T7	37.3	6.56	4.43	88.5	32.15	90.46	34.21
	Deltaphose	T1	30.6	7.39	4.53	87.6	33.98	88.09	34.11
		T2	45.3	6.69	4.7	87.3	34.5	86.95	34.66
		T3	32.0	5.97	4.46	86.2	32.92	88.83	33.59
		T4	76.0	6.52	4.66	83.6	33.24	87.5	36.77
		T5	30.6	6.54	4.96	87.0	33.21	88.5	36.57
		T6	36.0	6.55	4.66	85.9	33.50	89.46	34.58
		T7	32.0	7.11	4.53	87.5	34.25	89.12	32.0
	Proclaim	T1	28.0	6.6	4.6	87.9	33.27	88.19	35.48
		T2	32.0	6.74	4.6	87.8	32.73	89.07	38.76
		T3	34.6	6.84	4.13	86.1	32.54	88.8	30.22
		T4	38.6	6.21	4.56	86.4	33.53	87.78	32.24
		T5	33.3	6.19	4.76	91.0	33.43	89.67	37.61
		T6	28.3	6.48	4.7	88.2	24.15	87.68	32.01
		T7	32.0	6.69	4.46	86.1	34.13	88.07	32.96

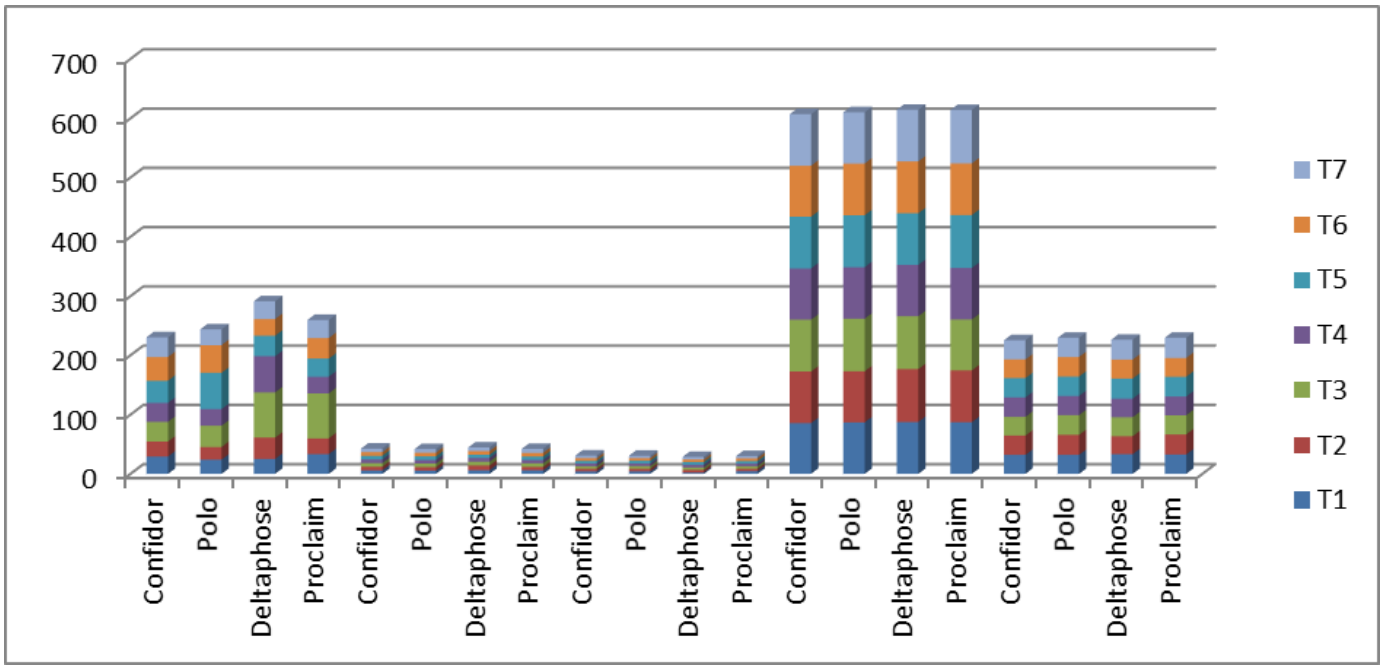

Fig 1: Effect of artificial damage simulation of insecticides three times picking of cotton

5. Conclusions

There was no significant effect of damage simulation (removal of fruiting bodies and leaves) and application of fertilizers and insecticides on seed index, fire maturity, and staple length GOT seed germination fibre strength and micronair.

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7. References

1. Abbuldahaab A, Hassanin MA. Analytical study of yield and its components of Egyptian cotton under different N levels and plant populations densities. Agriculture University of Cairo. J of plant sciences. 1991; 42(3):1029-1041.
2. Sarkar RK, Majumdar RC. Effect of farmyard manure, nitrogen and phosphorus on yield and fibre quality of upland cotton (*Gossypium hirsutum*) in rice fallow land. Indian J of Agricultural Sciences. 2002; 72(10):607-610.
3. Sharma SK, Sungarwal HS. Effect of growth regulators, sulfur fertilization and crop geometry on lint yield and fibre properties of American cotton (*Gossypium hirsutum* L.). J of Research on Crops. 2003; 4(2):174-177.
4. Thaxton PM, El-Zik KM, Dusek TF, Schaefer K. Phenology and yield of MAR cotton genotypes with and without insecticide treatments. Proc. Cotton School. J. of Sciences. 1997; 11(5):414-418.
5. Mullins GL, Burmester CH. Cotton response to the source of foliar potassium. University of California, USA. J of Entomology. 1994; 8(2):1537-1539.
6. Mullins GL, Monks CD, Delaney D. Cotton response to source and timing of nitrogen fertilization on a sandy coastal plain soil. J of Plant Nutrition. 2003; 26(7):1345-1353.
7. Pettigrew WT. Relationships between insufficient potassium and crop maturity in cotton. J of Agronomy. 2003; 95(5):1323-1329.
8. Pettigrew WT, Heitholt JJ, Meredith Jr WR. Genotypic interactions with potassium and nitrogen in cotton of varied maturity. J of Agronomy. 1996; 88(1):89-93.
9. Bauer PJ, May, Camberato JJ. Planting date and potassium fertility effects on cotton yield and fiber properties. J of Production Agriculture. 1998; 11(4):415-420.
10. E1-Nour MSA, Saeed MA, Morsy MA. Effect of potassium fertilization under two planting dates on yield, yield components and some technological and chemical properties of Giza 80 cotton cultivar. Egyptian J of Agricultural Research. 2000; 78(3):1219-1231.
11. Gormus O. Effects of rate and time of potassium application on cotton yield and quality in Turkey. J of Agronomy and Crop Science. 2000; 188(6):382-388.
12. Sharma SK, Dungarwal HS. Effect of growth regulators, sulphur fertilization and crop geometry on cotton seed yield and seed quality of cotton (*Gossypium hirsutum* L.). J of Research and Crops. 2003; 4(2):170-173.