

Project Report

1. Project Title : Evaluation of Product KAMAAL-CLAMP (Organic product) on wheat
2. Period : 2009-10 and 2010-11
3. a) Name of the Institute : Punjab Agricultural University, Ludhiana
b) Department : Agronomy
c) Location : Research Farm, Department of Agronomy, Ludhiana
4. Sponsors : Sh Ishwar Singh Kundu
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Experiment 1: Evaluation of time of application and graded levels of KAMAAL -CLAMP in conjunction with recommended dose of fertilizers in wheat

Particulars	Wheat
Treatments	Sixteen
Replications	Four
Experimental Design	Randomized Block Design
Variety	DBW 17
Chemical fertilizers	120-60-30; N-P ₂ O ₅ -K ₂ O; kg/ha
Seed rate	100 kg/ha
Row to row spacing	20 cm
Date of sowing	27-11-2009 and 9-12-2010
Date of harvesting	19-4-2010 and 27-4-2011

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doses to wheat crop the organic product "KAMAAL -CLAMP" were applied as per the treatment. The statistical analysis was done by using CPCS 1 software.

Table 2: The chemical analysis of Kamaal Clamp done by SGS India Pvt. Ltd (Organic Food Division, Gurgaon) is as under:

Particulars	Content (%)
Chlorides as Cl	1.38
Organic carbon	45.7
Nitrogen	0.63
Phosphorus	0.06
Potassium	0.74
Calcium	0.58
Magnesium	0.53
Sulphur	0.28
C/N ratio	72:1
pH	4.83
Bulk density	0.88g/ml
Boron	2.74 mg/kg
Copper	5.11 mg/kg
Manganese	173.60 mg/kg
Molybdenum	Not detected
Zinc	27.35 mg/kg
Lead	1.58 mg/kg
Cadmium	Not detected
Mercury	Not detected
Chromium	2.72 mg/kg
Arsenic	Not detected
Nickel	1.51 mg/kg
Tin	18.38 mg/kg
Cation Exchange capacity	7.63 meq/100 gm

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Results and Discussion:

The perusal of data in Table 3 revealed that all the treatments were statistically at par with respect to grain yield and other yield attributes of wheat during both the years. The recommended fertilizer treatments produced 44.75 and 45.10 q/ha grain yield during 2009-2010 and 48.11 and 47.90 q/ha grain yield during 2010-2011 which was statistically at par with recommended fertilizer + differential doses of Kamaal Clamp that is 17.5 and 12.5 kg/ha applied at 3, 2 and 1 days before/ after first irrigation. However, maximum grain yield during 2009-2010 (47.90 q/ha) and 49.66 q/ha during 2010-2011 was obtained with the application of 17.5 kg/ha Kamaal Clamp on same day of irrigation which was 7.0 per cent higher than recommended fertilizer alone. But it was almost similar with the application of 12.5 kg/ha of Kamaal Clamp applied on same day during 2009-2010 and was similar with the application of 17.5 kg/ha of Kamaal Clamp during 2010-2011 applied 1 days before/ after first irrigation.

The application of differential rates of Kamaal Clamp along with recommended fertilizer is found to have slight beneficial effect on ear length, number of grains/ear, 1000 grain weight and grain yield of wheat. This may be attributed to the chemical composition of Kamaal Clamp which contains beneficial micro nutrients like manganese, boron, zinc and copper as shown in Table 2. However, different times of application *i.e.* before/after irrigation of Kamaal Clamp does not affect grain yield or other yield attributing characters of wheat significantly.

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Table 3: Evaluation of time of application and graded levels of KAMAAL -CLAMP in conjunction with recommended dose of fertilizers in wheat

S. No.	Dose of Kamaal Clamp (kg/ha)	Days after/before irrigation	Ear length (cm)		No. of grain/ear		1000 grain weight (g)		Yield (q/ha)	
			2009-10	2010-11	9-10	10-11	9-10	10-11	9-10	10-11
Before irrigation										
1	17.5	3 days	10.0	10.4	59	62	41	41.6	47.13	48.90
2	12.5	3 days	10.0	10.2	59	60	42	41.4	47.30	48.29
3	17.5	2 days	9.2	10.6	55	62	39	41.8	46.15	49.50
4	12.5	2 days	9.8	10.0	58	59	40	41.2	46.90	49.04
5	17.5	1 days	10.4	10.8	60	64	43	41.6	47.45	49.55
6	12.5	1 days	9.4	10.4	58	60	39	41.4	46.55	49.30
7	17.5	Same day	10.8	10.8	63	65	43	41.8	47.90	49.66
8	12.5	Same day	10.6	10.6	60	63	43	41.5	47.68	49.40
9	Control		9.0	10.2	54	58	38	39.8	44.75	48.11
After irrigation										
10	17.5	3 days	9.4	10.2	55	58	39	40.4	46.51	48.51
11	12.5	3 days	10.0	10.0	59	56	40	40.2	47.00	48.30
12	17.5	2 days	9.8	10.2	54	58	40	40.4	46.73	48.46
13	12.5	2 days	9.4	10.0	54	54	40	40.2	46.72	48.26
14	17.5	1 days	10.4	10.4	58	62	42	41.0	47.35	48.98
15	12.5	1 days	9.4	10.2	60	60	39	40.6	46.32	48.35
16	Control		9.2	10.2	54	58	39	39.6	45.10	47.90
CD (0.05)			NS	NS	NS	NS	NS	NS	NS	NS

The differences in grain yield and yield attributing characters with the application of 100 % and 75% recommended fertilizer along with differential rates of Kamaal clamp were shown in Table 4. The perusal of data shown in Table 4 revealed that grain yield of wheat was significantly higher with the application of 100 % recommended fertilizer + differential rates of Kamaal Clamp compared with 75% recommended fertilizer + differential rates of Kamaal clamp. The maximum grain yield (45.20 q/ha) during 2009-2010 and (47.07 q/ha) during 2010-2011 was obtained with the application of 100 % recommended fertilizer + 22.5 kg/ha of Kamaal

clamp which was 7.3, 18.6 and 8.2 percent higher during 2009-2010 and 6.5, 16.9 and 8.9

percent higher during 2010-2011 than 100 % recommended fertilizer alone, 75 % recommended fertilizer alone and 75 % recommended fertilizer + 22.5 kg/ ha Kamaal clamp respectively. The beneficial effect Kamaal Clamp on ear length, number of grains/ear, 1000 grain weight and grain yield of wheat may be attributed to the presence of beneficial micro nutrients in the Kamaal Clamp as shown in Table 2.

Table 4: Evaluation of graded levels of chemical fertilizers and KAMAAL -CLAMP in wheat

S. No.	Dose of fertilizer of recommended	Dose (kg/ha)	No. of grains/ear		Ear length (cm)		1000 grain weight (g)		Yield (q/ha)	
			2009-10	2010-11	9-10	10-11	9-10	10-11	9-10	10-11
1	100%	7.5	62.6	62.0	10.4	10.6	39.9	40.1	42.23	44.25
2	75%	7.5	47.0	49.6	9.6	9.6	36.2	36.8	38.73	40.68
3	100%	10.0	63.0	62.6	10.4	10.6	40.2	40.1	42.55	44.85
4	75%	10.0	47.6	48.0	10.0	10.4	37.1	37.6	39.36	41.00
5	100%	12.5	64.2	64.0	10.6	10.8	40.4	40.5	43.78	45.30
6	75%	12.5	52.6	50.8	10.0	10.4	37.2	37.8	40.06	41.50
7	100%	15.0	64.8	64.2	10.6	10.8	41.1	41.3	44.76	46.00
8	75%	15.0	54.4	52.0	10.0	10.4	38.0	37.8	40.59	41.90
9	100%	17.5	65.2	64.6	10.8	10.8	41.8	42.0	44.98	46.65
10	75%	17.5	60.8	54.2	10.2	10.4	39.4	39.5	41.14	42.75
11	100%	20.0	68.8	64.8	10.8	10.8	43.1	43.2	45.09	46.90
12	75%	20.0	61.0	54.6	10.2	10.2	39.4	39.6	41.42	43.05
13	100%	22.5	69.8	65.0	10.8	11.0	43.6	43.6	45.20	47.07
14	75%	22.5	62.0	55.1	10.4	10.4	39.5	39.9	41.77	43.20
15	100%	Control	56.0	58.2	10.2	10.4	38.4	39.0	42.11	44.20
16	75%	Control	41.2	48.4	9.4	9.4	36.2	37.0	38.11	40.25
CD (0.05)			7.19	4.00	NS	NS	NS	NS	2.43	2.68

Conclusion:

The application of differential Kamaal Clamp along with recommended fertilizers yielded at par with alone application of recommended level of fertilizer. Similarly, grain yield of wheat was significantly higher with the application of 100 % recommended fertilizer + differential rates

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percent higher during 2010-2011 than 100 % recommended fertilizer alone, 75 % recommended fertilizer alone and 75 % recommended fertilizer + 22.5 kg/ ha Kamaal clamp respectively. The beneficial effect Kamaal Clamp on ear length, number of grains/ear, 1000 grain weight and grain yield of wheat may be attributed to the presence of beneficial micro nutrients in the Kamaal Clamp as shown in Table 2.

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3	100%	10.0	63.0	62.6	10.4	10.6	40.2	40.1	42.55	44.85
4	75%	10.0	47.6	48.0	10.0	10.4	37.1	37.6	39.36	41.00
5	100%	12.5	64.2	64.0	10.6	10.8	40.4	40.5	43.78	45.30
6	75%	12.5	52.6	50.8	10.0	10.4	37.2	37.8	40.06	41.50
7	100%	15.0	64.8	64.2	10.6	10.8	41.1	41.3	44.76	46.00
8	75%	15.0	54.4	52.0	10.0	10.4	38.0	37.8	40.59	41.90
9	100%	17.5	65.2	64.6	10.8	10.8	41.8	42.0	44.98	46.65
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11	100%	20.0	68.8	64.8	10.8	10.8	43.1	43.2	45.09	46.90
12	75%	20.0	61.0	54.6	10.2	10.2	39.4	39.6	41.42	43.05
13	100%	22.5	69.8	65.0	10.8	11.0	43.6	43.6	45.20	47.07
14	75%	22.5	62.0	55.1	10.4	10.4	39.5	39.9	41.77	43.20
15	100%	Control	56.0	58.2	10.2	10.4	38.4	39.0	42.11	44.20
16	75%	Control	41.2	48.4	9.4	9.4	36.2	37.0	38.11	40.25
CD (0.05)			7.19	4.00	NS	NS	NS	NS	2.43	2.68

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