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Appendix Table 1. ANOVA of seedling number/sq.m., tiller number/sq.m. and plant height of wheat as affected by irrigation and mulching treatments

Source of Variation	Seedling/sq.m.			Tiller/sq.m.			Plant height (cm.)	
	DF	MS	P	DF	MS	P	MS	P
Replication	1	15403.00	0.1672	3	21881.00	0.1459	46.132	0.2787
Irrigation (I)	3	8322.80	0.3155	3	74238.00	0.0071	1498.000	0.0000
Error (a)	3	4539.40		9	9510.30		30.669	
Mulching (M)	2	574.87	0.7573	2	89569.00	0.0004	412.020	0.0000
I x M	6	400.65	0.9671	6	16720.00	0.0906	55.688	0.0075
Error (b)	8	1997.40		24	7954.70		14.326	

Appendix Table 2. ANOVA of yield and yield components of wheat as affected by irrigation and mulching treatments

Source of Variation	Yield (kg./ha)			Spike/sq.m.		Grain/spike		TGW (gm.)	
	DF	MS	P	MS	P	MS	P	MS	P
Replication	3	1598700	0.0230	7886.8	0.1438	86.472	0.1853	16.7430	0.2042
Irrigation (I)	3	15788000	0.0000	44133.0	0.0013	476.580	0.0023	48.2430	0.0211
Error (a)	9	305360		3400.8		43.343		8.9282	
Mulching (M)	2	1732200	0.0001	4374.7	0.0640	121.940	0.0000	22.0210	0.0265
I x M	6	395980	0.0162	2404.3	0.1648	54.021	0.0000	2.9931	0.7454
Error (b)	24	119690		1415.9		5.250		5.1944	

Appendix Table 3. ANOVA of shoot dry matter of wheat (gm./sq.m.) at different growth stages as affected by irrigation and mulching treatments

Source of Variation	DF	7 DAS		14 DAS		21 DAS		28 DAS	
		MS	P	MS	P	MS	P	MS	P
Replication	2	2.1361	0.2159	46.760	0.3845	208.060	0.4091	871.08	0.3434
Irrigation (I)	3	3.1078	0.1626	3.222	0.9716	270.860	0.3427	1150.70	0.2662
Error (a)	6	0.8740		45.315		199.820		678.46	
Mulching (M)	2	12.9570	0.0184	141.140	0.0032	833.610	0.0016	4079.00	0.0032
I x M	6	1.4563	0.6137	28.398	0.1068	98.321	0.3722	381.78	0.5928
Error (b)	16	1.8885		10.969		84.412		485.08	

Source of Variation	DF	35 DAS		42 DAS		49 DAS	
		MS	P	MS	P	MS	P
Replication	3	13092.00	0.0002	3678.70	0.0341	686.57	0.9395
Irrigation (I)	3	2085.30	0.0687	11839.00	0.0009	37424.00	0.0095
Error (a)	9	620.34		815.08		5259.90	
Mulching (M)	2	14878.00	0.0003	17616.00	0.0001	16687.00	0.0015
I x M	6	1247.30	0.4590	1632.90	0.2575	7002.20	0.0106
Error (b)	24	1270.20		1171.50		1932.50	

Source of Variation	DF	56 DAS		70 DAS		90 DAS	
		MS	P	MS	P	MS	P
Replication	3	3176.7	0.5849	3895.8	0.6364	47242.0	0.0961
Irrigation (I)	3	116460.0	0.0001	273760.0	0.0000	525140.0	0.0000
Error (a)	9	4656.7		6560.3		16467.0	
Mulching (M)	2	48590.0	0.0000	82511.0	0.0001	89631.0	0.0020
I x M	6	6210.3	0.0774	13454.0	0.0693	4220.8	0.8826
Error (b)	24	2811.9		5889.9		11021.0	

Appendix Table 4. Shoot dry matter of wheat (gm./sq.m.) at different growth stages as affected by irrigation and mulching treatments

Treatments	Days after sowing									
	7	14	21	28	35	42	49	56	70	90
Early irrigation										
-Bare soil	4.66	24.75	42.80	85.10	151.30	237.20	322.70	407.00	508.50	492.80
-Straw mulch (3 t/ha)	7.56	24.70	71.10	106.80	204.60	281.20	319.80	446.60	574.00	565.80
-Straw mulch (6 t/ha)	9.00	29.10	54.67	94.27	159.10	230.50	377.40	410.20	539.70	600.00
Late irrigation										
-Bare soil	5.10	19.15	53.77	57.80	111.70	132.90	195.50	267.40	369.70	585.60
-Straw mulch (3 t/ha)	6.24	29.00	64.53	94.50	211.30	230.60	354.40	431.60	614.90	764.30
-Straw mulch (6 t/ha)	8.02	25.95	68.57	94.07	176.40	210.00	310.00	369.50	597.90	767.10
Full irrigation										
-Bare soil	5.66	19.20	46.70	90.70	150.80	202.60	362.40	431.00	664.30	810.10
-Straw mulch (3 t/ha)	5.80	28.45	58.07	105.80	182.10	244.40	354.10	499.30	686.20	891.50
-Straw mulch (6 t/ha)	6.76	31.30	60.00	131.80	187.10	231.90	355.80	524.80	729.70	886.00
No irrigation										
-Bare soil	4.08	20.65	40.60	60.50	111.40	134.50	148.30	158.20	214.20	263.80
-Straw mulch (3 t/ha)	6.18	32.95	56.57	108.60	168.40	213.90	264.70	315.50	404.10	453.80
-Straw mulch (6 t/ha)	5.80	23.55	49.57	107.00	154.50	197.30	248.90	289.00	357.50	405.30
LSD 0.05	3.17	7.64	15.90	38.12	52.02	49.95	64.16	77.39	112.01	153.22
LSD 0.01	4.61	11.11	21.91	52.53	70.49	67.69	86.94	104.88	151.79	207.63
P-irrigation (I)	ns	ns	ns	ns	ns	**	**	**	**	**
P-mulching (M)	**	**	**	**	**	**	**	**	**	**
I x M	ns	ns	ns	ns	ns	ns	*	ns	ns	ns

Note : ns = not significant

* = significant at $p < 0.05$

** = significant at $p < 0.01$

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Appendix Table 5. ANOVA of nitrogen, phosphorus and potassium uptake by wheat (kg./ha) at 35 days after sowing

Source of Variation	DF	Nitrogen		Phosphorus		Potassium	
		MS	P	MS	P	MS	P
Replication	1	392.12	0.0998	18.4980	0.0637	4518.00	0.0208
Irrigation (I)	3	155.05	0.2678	3.1548	0.3918	954.55	0.1333
Error (a)	3	70.70		2.2343		225.34	
Mulching (M)	2	1148.50	0.0001	4.6331	0.0655	3321.40	0.0004
I x M	6	134.46	0.0318	0.0943	0.5989	127.15	0.5090
Error (b)	8	31.55		1.1863		133.31	

Appendix Table 6. ANOVA of nitrogen, phosphorus and potassium uptake by wheat (kg./ha) at 56 days after sowing

Source of Variation	DF	Nitrogen		Phosphorus		Potassium	
		MS	P	MS	P	MS	P
Replication	1	722.59	0.0221	2.4961	0.1451	1436.50	0.2467
Irrigation (I)	3	1963.40	0.0044	48.3230	0.0026	10067.00	0.0274
Error (a)	3	37.78		0.6512		697.19	
Mulching (M)	2	816.32	0.0114	14.1080	0.0029	3402.30	0.0036
I x M	6	158.54	0.2628	2.1253	0.1791	258.94	0.5181
Error (b)	8	99.07		1.0641		276.43	

Appendix Table 7. Nitrogen, phosphorus and potassium uptake by wheat (kg./ha) 35 and 56 days after sowing as affected by irrigation and mulching treatment

Treatments	At 35 DAS			At 56 DAS		
	N	P	K	N	P	K
Early irrigation						
-Bare soil	44.58	5.46	66.44	75.44	8.33	112.20
-Straw mulch (3 t/ha)	60.96	7.27	106.80	70.62	9.63	103.60
-Straw mulch (6 t/ha)	53.27	5.50	88.55	79.18	8.22	135.30
Late irrigation						
-Bare soil	32.79	3.69	45.93	58.97	6.56	64.00
-Straw mulch (3 t/ha)	74.91	6.38	77.49	85.03	9.05	125.70
-Straw mulch (6 t/ha)	63.63	5.65	82.38	79.85	8.30	97.59
Full irrigation						
-Bare soil	48.38	5.58	70.83	74.99	9.25	114.20
-Straw mulch (3 t/ha)	54.05	6.42	97.10	90.40	12.50	157.90
-Straw mulch (6 t/ha)	56.77	6.84	109.80	87.85	13.12	163.20
No irrigation						
-Bare soil	28.13	4.17	42.93	21.34	4.77	32.76
-Straw mulch (3 t/ha)	54.92	4.89	75.05	49.68	4.78	57.63
-Straw mulch (6 t/ha)	51.87	5.30	75.15	57.99	6.59	63.11
LSD 0.05	16.53	2.05	26.74	17.41	1.99	27.24
LSD 0.01	22.39	2.78	36.24	23.59	2.69	36.91
P-irrigation (I)	ns	ns	ns	**	**	**
P-mulching (M)	**	*	**	**	**	**
I x M	*	ns	ns	ns	ns	ns

Note : ns = not significant

* = significant at $p < 0.05$

** = significant at $p < 0.01$

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Appendix Table 8. Days to anthesis, days to maturity and grain filling period of wheat as affected by irrigation and mulching treatments

Treatments	Days to Anthesis	Days to Maturity	Grain Filling Period
Early irrigation			
-Bare soil	51	84	33
-Straw mulch (3 t/ha)	53	87	34
-Straw mulch (6 t/ha)	54	89	35
Late irrigation			
-Bare soil	48	85	37
-Straw mulch (3 t/ha)	50	92	42
-Straw mulch (6 t/ha)	51	94	43
Full irrigation			
-Bare soil	51	90	39
-Straw mulch (3 t/ha)	53	92	39
-Straw mulch (6 t/ha)	54	94	40
No irrigation			
-Bare soil	48	80	32
-Straw mulch (3 t/ha)	50	84	34
-Straw mulch (6 t/ha)	51	85	34

Note : Days were counted from sowing

Appendix Table 9. Soil temperature (°C) at 03:00 pm. during the wheat growth period as affected by irrigation and mulching treatments

Days after Sowing	Early Irrigation			Late Irrigation			Full Irrigation			No Irrigation			Air
	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	
2	26.00	23.75	23.50	26.13	24.50	23.50	26.25	23.75	23.75	26.25	24.13	23.25	26.50
4	25.50	23.75	23.00	26.00	24.25	23.00	25.75	23.25	23.25	25.75	24.00	22.75	27.90
6	26.38	24.38	24.00	26.88	24.63	23.38	26.75	24.13	23.25	26.75	24.00	23.63	29.80
8	27.38	24.75	24.38	28.00	25.50	24.25	27.50	25.00	24.25	28.13	25.50	24.50	30.55
10	28.63	25.75	25.13	29.13	26.25	24.75	28.88	25.88	24.88	29.25	26.38	25.13	31.85
12	28.50	25.75	25.00	28.75	26.00	25.00	29.00	25.75	25.00	29.00	26.00	25.25	31.20
14	29.88	26.00	25.00	30.00	26.13	25.00	29.38	25.88	25.00	29.75	26.25	25.25	30.80
16	30.63	26.63	25.25	30.25	26.38	25.63	29.50	26.25	25.63	30.25	26.50	26.00	31.50
18	28.50	26.25	25.38	30.38	26.38	25.88	28.25	26.25	25.75	30.00	26.50	25.75	31.40
20	27.88	26.38	25.50	30.25	26.00	25.75	27.75	25.88	25.25	30.13	26.50	25.50	30.25
22	27.38	25.38	24.63	29.63	25.38	25.00	26.88	25.13	24.75	29.38	25.50	25.25	30.15
24	26.00	24.25	23.50	28.75	24.50	24.25	25.50	24.25	23.75	28.75	25.00	24.50	29.65
26	26.00	24.50	23.75	29.75	24.50	24.25	25.50	24.25	23.50	29.00	25.00	24.50	30.70
28	25.38	24.38	23.25	29.75	24.50	24.25	24.75	24.00	23.38	29.00	24.75	24.50	31.05
30	25.50	23.88	22.75	28.75	24.38	24.13	24.50	23.13	23.25	28.50	24.88	24.38	31.10
32	25.50	24.50	23.75	29.75	25.25	25.00	25.00	24.38	24.00	29.38	26.25	25.25	32.20
34	25.00	24.25	23.25	30.50	25.25	25.00	24.00	23.63	23.50	30.25	26.13	25.25	31.85
36	23.88	23.38	22.50	30.25	24.88	24.50	22.75	22.63	22.63	30.00	25.88	24.50	32.25
38	23.00	23.00	21.75	29.25	24.25	24.00	21.50	21.75	22.00	29.25	25.00	23.75	31.40
40	22.50	22.13	21.00	28.88	23.75	23.63	20.75	21.13	21.25	28.75	25.00	23.38	32.10
42	22.38	22.13	21.00	28.38	23.75	23.63	20.88	21.25	21.38	28.38	24.88	23.13	30.60
44	24.00	23.25	22.38	27.50	25.00	24.38	22.63	23.13	23.00	30.25	26.63	25.00	30.40
46	24.25	23.25	22.50	27.50	24.00	23.50	21.50	22.25	22.25	30.75	27.00	25.25	30.55
48	24.00	23.25	22.75	27.50	24.50	23.75	22.25	22.75	22.75	30.50	26.75	25.00	30.95
50	23.88	22.75	21.50	25.38	21.75	21.75	20.00	20.75	21.00	31.00	26.38	24.50	30.85
52	23.50	22.75	21.50	24.50	21.50	21.50	19.50	19.75	20.25	30.75	26.25	24.25	32.30
54	24.50	23.75	22.00	25.13	22.25	22.13	20.50	20.75	20.88	31.50	26.63	24.88	32.35
56	26.00	25.25	23.50	26.75	24.00	23.50	22.50	22.50	23.00	32.25	28.00	26.25	30.95
58	26.00	25.25	23.50	26.75	24.50	24.50	23.50	23.00	23.25	31.75	28.00	26.25	31.30
60	26.50	25.25	24.00	25.75	23.75	23.00	23.00	22.25	22.75	32.75	28.50	27.00	30.75
62	26.50	25.25	24.00	25.25	23.00	23.00	22.00	22.00	22.25	32.50	28.25	26.75	31.25
64	28.00	26.25	24.00	25.50	23.50	23.00	22.00	22.00	22.50	34.00	29.25	27.50	31.70
66	28.00	26.25	24.00	25.00	23.00	23.00	22.00	22.00	22.00	34.75	29.25	28.00	33.50
68	28.50	27.00	24.50	24.75	24.00	23.00	23.50	21.75	22.50	35.00	29.25	28.00	32.50
70	29.00	27.25	25.00	25.00	24.00	23.25	24.50	23.25	23.50	35.00	29.75	28.25	33.65
72	29.50	27.50	25.00	25.75	25.00	24.00	25.50	23.75	23.75	35.00	29.75	28.25	33.75
74	29.50	28.00	25.00	25.00	23.50	23.00	24.00	22.50	23.00	36.00	30.25	29.00	34.35
76	29.50	27.50	25.00	23.75	23.00	23.00	23.00	22.50	22.50	34.50	30.00	28.50	34.05
78	30.00	28.25	25.50	24.00	23.50	23.00	23.50	22.75	23.00	35.00	30.25	29.00	34.50
80	32.50	30.50	27.50	26.00	25.00	25.00	25.50	24.75	24.75	37.50	32.50	31.00	33.40
82	32.50	30.75	27.50	26.00	25.00	25.00	25.50	24.75	25.00	37.50	32.25	31.00	32.55
84	33.50	31.50	29.00	26.75	27.00	26.50	28.00	26.25	26.00	38.50	33.25	32.00	33.95
86	34.00	31.50	29.00	27.50	27.50	27.00	29.00	26.75	26.50	38.50	33.75	32.50	35.05
88	35.00	33.00	30.00	29.25	28.50	28.00	30.00	27.50	27.50	40.50	35.00	33.50	35.75
90	34.00	32.25	29.00	29.25	28.00	27.50	29.50	27.25	27.25	38.50	33.75	32.50	34.95
92	37.00	33.25	30.50	31.00	29.50	33.50	31.00	28.75	28.50	40.50	35.00	33.50	35.70
94	36.00	32.25	30.00	31.00	29.50	28.50	30.50	28.75	28.50	39.00	34.50	32.75	36.15
Average	26.94	25.69	24.33	27.36	24.80	24.49	24.75	23.76	23.78	30.92	27.19	26.13	31.96

Note : Average soil temperature was calculated from sowing to maturity in each treatment

BS = Bare soil, SM3 = Straw mulch (3 t/ha), SM6 = Straw mulch (6 t/ha)

Appendix Table 10. Soil temperature (°C) at 07:00 am. during the wheat growth period as affected by irrigation and mulching treatments

Days after Sowing	Early Irrigation			Late Irrigation			Full Irrigation			No Irrigation			Air
	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	
2	16.50	17.75	18.25	16.75	17.75	18.50	15.50	18.00	18.75	16.00	18.00	18.50	13.10
4	15.63	17.63	18.25	15.75	17.75	18.25	15.13	17.75	18.50	15.38	17.50	18.38	11.65
6	18.25	18.75	19.00	19.00	19.25	19.50	18.50	19.50	19.50	18.25	19.25	19.50	13.40
8	16.63	18.25	18.88	16.88	18.63	19.13	16.50	18.75	19.13	16.50	18.63	19.00	14.40
10	17.50	19.00	19.00	17.75	19.25	19.50	16.75	19.25	19.75	17.25	19.25	19.50	15.70
12	19.00	20.00	20.25	19.13	20.25	20.63	18.63	20.50	20.75	19.13	20.25	20.75	16.70
14	18.50	19.75	20.25	18.75	20.00	20.25	18.25	20.25	20.50	18.50	19.75	20.25	16.25
16	18.50	20.00	21.00	19.00	20.00	20.50	18.50	20.00	21.00	19.00	19.75	20.00	16.25
18	20.38	20.88	21.13	20.75	21.25	21.25	20.38	21.25	21.25	20.75	20.75	21.25	17.50
20	20.75	21.00	21.50	21.00	21.25	21.25	20.25	21.50	21.50	21.00	21.25	21.50	17.55
22	19.00	19.25	20.00	19.25	19.75	20.25	18.75	20.25	20.25	19.50	19.75	20.25	15.35
24	18.00	18.50	19.00	18.25	19.00	19.25	17.75	19.25	19.00	18.75	18.75	24.25	13.35
26	18.00	18.50	19.00	18.25	19.00	19.25	17.75	19.25	19.00	18.75	18.75	24.25	13.70
28	18.00	18.25	19.00	18.50	19.00	19.00	18.00	18.75	18.75	18.50	18.25	18.75	13.75
30	19.00	19.25	19.75	19.75	19.75	20.00	18.75	19.75	19.75	19.25	19.75	19.75	14.40
32	20.13	20.25	20.75	20.13	20.50	20.63	20.00	20.75	20.75	20.38	20.50	20.63	16.85
34	20.00	20.00	20.75	20.25	20.50	20.50	19.50	20.75	20.75	20.00	20.25	20.50	14.70
36	19.00	19.00	19.71	19.24	19.47	19.47	18.53	19.71	19.71	19.00	19.24	19.47	12.60
38	16.25	17.00	18.00	17.25	17.75	18.00	16.00	17.75	18.00	17.25	17.75	18.00	11.30
40	16.50	16.25	17.50	17.25	17.50	17.50	16.00	17.25	17.50	17.25	17.50	17.75	10.75
42	15.00	15.75	17.00	16.50	17.50	17.25	15.00	16.50	16.75	16.25	17.25	17.25	12.55
44	18.50	18.75	19.75	20.00	20.00	20.00	18.50	19.25	19.50	20.25	20.00	19.75	15.90
46	18.00	18.00	19.00	19.50	19.25	20.25	18.25	19.50	20.00	19.25	19.75	19.50	13.60
48	17.00	17.25	18.25	17.50	18.50	19.25	16.50	18.25	18.75	18.25	18.75	19.00	11.35
50	16.50	16.75	17.75	17.00	17.50	18.25	16.00	17.50	18.00	17.25	18.75	18.50	11.15
52	16.00	16.00	17.00	16.25	16.50	17.25	15.00	16.50	17.00	17.25	18.00	17.75	10.15
54	16.00	16.00	17.00	16.25	16.50	17.25	15.00	16.50	17.00	17.25	18.00	17.75	12.50
56	19.50	19.25	20.00	19.50	19.50	20.00	18.50	19.50	20.00	20.25	20.75	20.50	17.25
58	20.00	20.00	20.75	20.50	20.50	21.00	19.50	20.50	20.50	20.75	21.50	21.75	16.80
60	19.50	19.75	20.25	19.75	20.00	20.50	19.00	20.00	20.00	20.25	21.25	21.25	13.20
62	19.50	19.00	20.00	18.75	20.00	20.00	18.75	19.75	20.00	19.25	20.75	21.00	14.50
64	19.00	18.75	20.00	18.75	19.50	20.00	18.00	19.00	19.50	19.25	20.50	20.50	14.00
66	18.50	18.75	19.50	17.75	18.50	19.00	17.00	18.50	19.00	19.00	20.25	20.50	13.30
68	19.00	19.25	20.00	17.50	18.50	19.25	17.00	18.50	19.00	19.50	20.50	20.75	13.10
70	18.00	18.50	19.00	17.00	18.50	18.50	17.00	18.00	18.25	18.50	20.00	20.25	12.70
72	19.50	19.75	20.00	18.00	19.50	19.25	18.00	18.75	19.25	19.50	21.00	20.75	13.75
74	19.00	19.25	20.00	18.00	19.00	19.25	18.00	18.75	19.25	19.50	20.50	20.50	13.65
76	20.00	20.00	20.50	18.50	19.50	20.00	18.00	19.50	19.75	20.00	21.25	21.25	13.05
78	20.00	20.25	21.00	18.75	19.50	20.00	18.00	19.50	19.75	20.50	21.25	21.50	15.15
80	22.50	22.25	22.00	20.50	21.00	21.25	20.00	21.00	21.00	22.50	23.25	22.75	17.05
82	24.00	23.25	23.00	21.50	22.00	22.00	21.00	21.75	21.75	24.00	24.50	24.50	19.60
84	23.00	22.25	23.00	20.00	21.50	22.00	20.50	21.25	21.50	22.50	23.75	24.00	17.75
86	23.00	23.25	23.25	21.00	22.00	22.00	22.00	22.00	22.00	23.50	24.25	24.25	19.35
88	22.50	22.50	23.00	20.50	21.50	22.00	21.00	21.50	21.50	22.00	23.00	23.00	18.25
90	23.00	23.25	23.25	21.00	22.00	22.00	22.00	22.00	22.00	23.50	24.25	24.25	19.35
92	22.50	22.50	23.00	20.50	21.50	22.00	21.00	21.50	21.50	22.00	23.00	23.00	18.25
94	23.00	23.25	23.25	21.00	22.00	22.00	22.00	22.00	22.00	23.50	24.25	24.25	19.35
Average	18.65	19.18	19.89	18.64	19.51	19.87	18.15	19.47	19.76	18.87	19.91	20.41	14.81

Note : Average soil temperature was calculated from sowing to maturity in each treatment
BS = Bare soil, SM3 = Straw mulch (3 t/ha), SM6 = Straw mulch (6 t/ha)

Appendix Table 11. Changes of soil temperature (°C) during the daytime period (07:00 am. to 05:00 pm.) at booting stage of wheat as affected by irrigation and mulching treatments

Time (hr.)	Early Irrigation			Late Irrigation			Full Irrigation			No Irrigation		
	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6
07:00	18.25	18.38	19.30	19.63	19.93	20.22	18.31	18.78	19.46	19.50	19.63	19.88
08:00	18.40	18.56	19.41	19.81	20.00	20.25	18.47	18.88	19.50	19.80	19.93	20.00
09:00	18.89	19.00	19.56	20.44	20.28	20.39	18.89	19.27	19.69	20.75	20.40	20.36
10:00	19.57	19.63	19.88	21.63	20.88	20.78	19.56	19.88	20.16	22.38	21.44	21.31
11:00	20.67	20.65	20.52	23.13	22.00	21.89	20.31	20.44	20.69	24.19	22.37	22.20
12:00	22.28	22.00	21.25	25.35	22.75	22.55	21.59	21.49	21.44	27.00	23.88	23.63
13:00	22.99	22.66	21.81	26.64	23.75	23.50	22.20	22.10	21.81	28.54	24.73	24.44
14:00	23.50	23.06	22.06	27.39	24.39	24.00	22.69	22.53	22.16	29.71	25.57	25.00
15:00	23.65	23.25	22.25	27.56	24.65	24.35	22.88	22.78	22.34	29.81	25.81	25.13
16:00	23.44	23.00	22.15	27.13	24.46	24.19	22.75	22.59	22.28	29.50	25.50	25.00
17:00	23.10	22.65	22.00	26.25	23.75	23.50	22.57	22.47	22.15	28.50	25.00	24.50

Note : BS = Bare soil
 SM3 = Straw mulch (3 t/ha)
 SM6 = Straw mulch (6 t/ha)

Appendix Table 12. Soil chemical properties and soil texture of the experimental plots (at 0-25 cm. depth)

Block	pH <u>1/</u>	OM. <u>2/</u> (%)	P <u>3/</u> (ppm.)	K <u>4/</u> (ppm.)	Texture		
					%Sand	%Silt	%Clay
1	5.10	1.11	75.00	52.50	62.68	21.00	16.32
2	5.20	1.08	50.00	67.50	58.68	25.00	16.32

Note : 1/ Soil:Water = 1:1
2/ Walkley & Black method
3/ Bray II method
4/ 1N NH₄OAc, pH 7 extraction

Appendix Table 13. Climatic data during the growing season at the research station of Multiple Cropping Center, Faculty of Agriculture, Chiang Mai University

Days after Sowing	Air Temp. (°C)		Soil Temp. (°C)		Air Humidity (%)	E-pan (mm./day)	Wind (km./day)	Sunshine (hrs.)	Solar Radiation (mm./day)	PET.	Rain (mm.)
	Min.	Max.	Min.	Max.	(%)						
2	13.1	26.5	21.7	25.5	62.4	3.4	74.7	9.6	7.3	2.4	
4	11.7	27.9	21.1	25.1	67.9	4.3	56.2	9.2	7.1	2.2	
6	13.4	29.8	21.4	25.8	33.2	3.4	60.1	9.1	7.1	1.2	
8	14.4	30.6	21.9	26.2	71.4	3.4	52.2	9.6	7.2	2.5	
10	15.7	31.9	21.9	26.5	67.8	4.1	59.0	9.5	7.1	2.7	
12	16.7	31.2	22.7	26.1	35.4	3.9	56.4	7.2	6.2	1.3	
14	16.3	30.8	22.8	26.4	66.2	3.4	61.2	9.3	7.1	2.6	
16	16.3	31.5	22.7	26.8	70.0	4.2	56.6	9.6	7.2	2.7	
18	17.5	31.4	23.5	27.5	35.6	4.1	68.1	8.8	6.8	1.4	
20	17.6	30.3	23.6	26.6	35.5	4.1	80.6	8.1	6.5	1.4	
22	15.4	30.2	22.4	26.3	67.1	4.4	57.2	9.1	7.0	2.5	
24	13.4	29.7	21.8	25.6	66.1	3.6	56.9	9.6	7.2	2.4	
26	13.7	30.7	21.6	25.0	33.7	4.4	57.5	9.5	7.2	1.3	
28	13.8	31.1	21.7	0.0	0.0	3.9	53.0	9.7	7.3	0.0	
30	14.4	31.1	22.0	25.4	69.3	2.8	61.9	8.2	6.6	2.5	0.7
32	16.9	32.2	24.1	27.5	70.5	4.8	79.4	9.7	7.3	2.9	
34	14.7	31.9	22.4	26.0	30.8	4.6	56.8	9.6	7.3	1.3	
36	12.6	32.3	21.6	25.8	62.4	4.4	58.0	10.0	7.5	2.6	
38	11.3	31.4	20.6	24.9	60.6	3.8	54.9	10.0	7.5	2.4	
40	10.8	32.1	20.0	23.6	31.1	4.5	52.5	9.2	7.2	1.3	
42	12.6	30.6	20.6	24.1	65.2	3.0	49.3	7.3	6.4	2.4	0.2
44	15.9	30.4	21.9	25.1	36.3	4.0	61.9	7.9	6.7	1.3	
46	13.6	30.6	21.3	24.5	79.6	5.0	78.9	9.8	7.6	2.6	
48	11.4	31.0	20.6	24.6	30.7	5.0	55.7	9.6	7.5	1.3	
50	11.2	30.9	20.3	24.5	57.1	4.2	61.2	9.8	7.7	2.6	
52	10.2	32.3	19.6	24.0	57.3	4.1	53.8	9.8	7.7	2.6	
54	12.5	32.4	20.3	23.1	30.9	3.9	55.4	8.9	7.4	1.3	
56	17.3	31.0	22.2	24.9	67.9	3.1	56.0	6.8	6.5	2.9	5.1
58	16.8	31.3	22.4	25.2	66.9	4.5	68.5	7.6	6.9	3.0	
60	13.2	30.8	22.2	24.9	63.3	4.6	88.0	7.6	7.0	3.1	
62	14.5	31.3	21.3	24.7	31.8	4.4	70.7	8.5	7.4	1.5	
64	14.0	31.7	21.5	25.1	62.3	5.3	68.0	9.8	8.0	3.1	
66	13.3	33.5	21.4	25.5	57.9	5.0	62.7	9.9	8.2	3.1	
68	13.1	32.5	21.3	24.5	30.1	6.9	71.5	9.8	8.1	1.5	
70	12.7	33.7	21.3	25.3	57.7	4.8	56.9	9.7	8.2	3.1	
72	13.8	33.8	21.6	25.6	57.8	4.7	62.0	9.8	8.3	3.3	
74	13.7	34.4	21.6	25.3	53.3	5.0	59.7	10.1	8.5	3.4	
76	13.1	34.1	21.2	25.0	28.7	5.4	50.4	9.4	8.3	1.7	
78	15.2	34.5	21.8	25.5	57.2	4.0	47.7	9.3	8.2	3.5	
80	17.1	33.4	22.6	25.8	64.1	5.3	96.4	9.0	8.2	3.8	
82	19.6	32.6	23.6	25.7	30.5	5.9	116.4	8.4	8.0	2.0	
84	17.8	34.0	23.4	26.8	61.0	5.7	46.0	8.9	8.3	3.7	
86	19.4	35.1	24.3	26.6	29.9	4.6	64.0	9.2	8.4	2.0	
88	18.3	35.8	23.6	26.5	50.7	7.3	94.0	8.1	8.0	4.2	
90	19.4	35.0	22.7	26.0	24.9	6.6	104.2	9.4	8.7	3.4	
92	18.3	35.7	23.5	26.7	51.9	6.4	94.2	9.4	8.7	4.2	
94	19.4	36.2	23.9	27.4	53.2	6.0	75.5	9.6	8.9	4.3	
Average	14.8	32.0	22.0	25.0	50.9	4.5	65.6	9.1	7.5	2.4	

Note : Soil temperatures were recorded at 10 cm. depth

Appendix Table 14. Soil moisture content (% by weight) before irrigation in different soil layers

Depth (cm.)	Early Irrigation			Late Irrigation			Full Irrigation			No Irrigation		
	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6	BS	SM3	SM6
(A) 0-25 cm. depth												
0 DAS	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21
14 DAS	10.72	13.16	14.33	11.37	13.37	14.59	11.05	13.27	14.95	10.08	12.96	15.08
29 DAS	8.22	8.91	9.18	8.53	9.44	9.95	8.83	9.97	9.71	7.00	7.13	9.28
44 DAS	6.70	6.82	7.56	5.38	5.61	6.05	6.28	7.36	7.52	5.44	5.73	6.09
59 DAS	5.79	6.03	6.40	5.86	7.51	7.75	7.60	8.23	8.41	4.26	4.64	5.10
74 DAS	4.88	5.23	5.32	5.20	6.07	7.24	5.10	6.07	6.68	3.85	4.46	4.71
90 DAS	3.72	4.24	4.41	4.79	4.94	4.91	4.47	4.76	5.23	3.09	3.98	4.22
(B) 25-50 cm. depth.												
0 DAS	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20
14 DAS	9.62	11.34	13.03	10.94	13.20	13.74	10.28	12.27	12.89	8.29	9.47	13.32
29 DAS	9.32	10.51	10.58	9.14	9.82	10.49	8.97	9.12	10.39	8.48	9.46	9.76
44 DAS	8.67	9.10	10.46	5.54	7.10	8.18	9.60	9.85	10.21	5.45	6.45	6.39
59 DAS	6.88	7.28	8.90	7.52	8.51	9.25	7.21	7.55	9.77	4.94	5.76	5.89
74 DAS	5.09	5.45	7.33	7.11	7.28	8.62	4.95	6.79	7.90	4.21	5.07	5.38
90 DAS	4.42	4.43	5.23	4.59	4.98	5.65	4.24	4.80	5.22	4.53	5.07	4.72
(C) 50-75 cm. depth												
0 DAS	17.24	17.24	17.24	17.24	17.24	17.24	17.24	17.24	17.24	17.24	17.24	17.24
14 DAS	16.12	13.89	11.93	16.39	15.09	12.87	16.26	14.49	12.40	15.86	12.69	11.00
29 DAS	13.48	12.92	12.24	12.50	11.67	12.17	12.52	12.92	12.24	13.39	12.52	10.08
44 DAS	13.64	12.27	12.77	8.02	9.08	9.79	12.98	11.68	12.51	9.13	9.17	8.33
59 DAS	10.81	8.11	9.11	10.63	10.40	9.19	9.43	13.17	13.23	9.83	7.81	8.73
74 DAS	7.99	3.95	5.46	9.57	11.25	9.77	6.47	8.23	9.14	6.49	6.44	9.13
90 DAS	4.54	4.54	4.54	7.69	6.49	6.89	7.61	6.26	5.25	7.03	4.93	7.15
(D) 75-100 cm. depth												
0 DAS	18.82	18.82	18.82	18.82	18.82	18.82	18.82	18.82	18.82	18.82	18.82	18.82
14 DAS	10.54	14.42	13.25	12.97	14.26	13.15	11.75	14.34	13.20	15.10	14.58	13.35
29 DAS	12.19	14.37	14.56	13.23	14.35	13.89	14.27	13.41	13.22	14.88	14.39	11.74
44 DAS	15.56	15.30	14.16	12.91	11.64	11.31	14.24	13.76	14.20	12.21	12.43	10.54
59 DAS	12.10	10.30	10.76	13.33	15.11	12.18	12.66	13.04	13.37	11.97	11.22	10.35
74 DAS	8.63	5.30	7.36	12.15	10.93	11.95	9.28	13.43	10.83	10.75	10.00	10.17
90 DAS	7.00	5.00	7.14	7.73	10.19	11.64	10.11	8.29	8.48	9.99	8.10	12.11

Note : BS = Bare soil

SM3 = Straw mulch (3 t/ha)

SM6 = Straw mulch (6 t/ha)

DAS = Days after sowing

Appendix Table 15. Effects of irrigation and mulching on seedling number of wheat (plants/m²)

Mulching	Irrigation				Mean
	Early	Late	Full	None	
Bare soil	227	323	272	297	280
Straw (3 t/ha)	228	313	248	311	275
Straw (6 t/ha)	220	295	270	268	263
Mean	225	310	263	292	273

LSD_{0.05} for irrigation (I) = NS

LSD_{0.05} for mulching (M) = NS

Appendix Table 16. Effects of irrigation and mulching on 1,000-grain weight (gm.) in wheat

Mulching	Irrigation				Mean
	Early	Late	Full	None	
Bare soil	30.00	35.75	35.25	33.00	33.50
Straw (3 t/ha)	28.75	33.25	31.25	32.50	31.44
Straw (6 t/ha)	29.25	33.25	31.50	32.00	31.50
Mean	29.33	34.08	32.67	32.50	32.15

LSD_{0.05} for irrigation (I) = 2.76 gm.

LSD_{0.01} for mulching (M) = 1.66 gm.

LSD_{0.05} for I x M = NS

Appendix Table 17. Effects of irrigation and mulching on number of grain-bearing spikelets/spike in wheat

Mulching	Irrigation				Mean
	Early	Late	Full	None	
Bare soil	12.75	10.12	14.62	10.62	12.03
Straw (3 t/ha)	14.37	14.87	15.12	12.12	14.12
Straw (6 t/ha)	12.12	14.37	15.37	13.00	13.72
Mean	13.08	13.12	15.04	11.92	13.29

LSD_{0.01} for irrigation (I) = 1.89 spikelets/spike

LSD_{0.01} for mulching (M) = 0.76 spikelets/spike

LSD_{0.01} for I x M = 1.51 spikelets/spike

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