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**PERFORMANCE OF NEW HIGH YIELDING WHEAT VARIETIES
ON THE HIGH ALTITUDE REGIONS OF KERALA**

Wheat requires cool, moist weather during major part of its growing period. Therefore, it is a crop of the high altitude regions, as far as Kerala is concerned. Emmer wheat (*Triticum dicoccum*) is cultivated in small pockets in Kerala in Munnar, Nelliampathy and Wynad hills during the winter season. The varieties belonging to this species are poor yielders though they are resistant to brown rust and powdery mildews. In order to popularise, cultivation of high yielding varieties a multilocational adaptability trial was conducted during the winter season of 1975-76, with 20 wheat varieties at 7 locations (table 1) situated in the high altitude regions of Western Ghats; in collaboration with the All India Co-ordinated Wheat Improvement Project. Except at Ambalavayal, the treatments (varieties) were replicated 3 times in a randomised block design. The experiment was not replicated at Ambalavayal due to want of enough seed material.

Table 1

Locations and elevations of the locations from the mean sea level (MSL)

Location	elevation (m)
Madupatty	1,800
Vattavada	2,000
Peermade	940
Nelliampathy	1,066
Attappady	460
Pampadumpara	950
Ambalavayal	974

At all the locations, the test varieties (Table 2) were direct-seeded during November at 23 cm row spacing adopting a seed rate of 100 kg per ha. Prior to seeding, 40 kg N, 100 kg P₂O₅ and 40 kg K₂O (per ha) were incorporated into the soil as basal dressing. At the mid vegetative phase, nitrogen was top-dressed at 40 kg per ha.

The gross and net plot sizes were, 8.28 m² and 4.60 m² respectively. At all locations the crop was irrigated.

Table 2

Flowering duration, total duration, plant height and grain yield of wheat varieties

Designation	Flowering duration (days)				Total duration (days)				Plant height (cm)				Grain yield (kg)			
	Atta	Madu	Peer	Vatta	Atta	Madu	Peer	Vatta	Atta	Madu	Peer	Vatta	Atta	Madu	Peer	Vatta
W 537	46	54	44	68	70	117	99	128	70	76	66	80	1793	2373	755	641
276	63	73	55	67	80	132	114	134	49	75	77	88	685	1510	1423	876
D 2 35	56	64	41	70	76	134	99	128	62	70	67	68	587	3119	1336	423
28 ⁿ	50	64	54	63	70	124	10	127	65	80	82	100	1207	3306	1698	410
VP 532	43	64	45	63	67	127	99	128	64	72	72	99	1120	3286	967	482
1839	47	64	55	68	70	126	110	137	56	92	65	83	1641	2242	1413	689
W 135	49	54	52	63	70	136	99	128	69	77	79	96	1543	4769	1559	615
W 513	56	54	44	70	78	128	112	126	55	80	69	93	1076	3720	1511	365
W 535	50	54	44	68	75	115	99	135	50	74	63	96	891	1245	1178	441
W 505	50	64	46	52	75	136	99	128	68	82	77	95	1065	3458	1722	932
W 521	45	54	45	70	73	116	99	126	63	63	68	86	1609	1610	922	480
W 524	56	64	46	73	75	135	112	146	60	68	57	66	1033	693	734	84
W 515	54	54	47	70	78	134	110	130	66	70	74	85	739	3597	1722	739
W 517	48	54	46	73	70	135	99	128	59	82	75	91	1413	4697	1927	665
W 539	51	54	50	63	78	123	110	127	59	75	72	95	1130	3876	1088	1297
1 687	49	74	47	77	72	137	114	143	44	84	74	79	659	4142	1297	969
1 667	47	54	45	63	70	118	99	127	57	86	65	91	1446	4797	1288	458
1 267	51	54	44	63	75	134	99	132	62	80	63	91	1424	2023	635	773
Red Lerma	48	64	47	73	72	133	105	127	64	87	75	91	1228	5119	1413	1663
Loti Lerma	49	54	54	70	70	128	105	125	71	82	74	93	1196	4832	1657	1030
Mean	50.4	58.45	47.55	67.35	73.2	123.5	98.65	130.85	57.7	77.25	67.0	87.25	1174	3226	1248	702

Atta: Attappady

Madu: Madupatty

Peer: Peermade

Vatta: Vattavada

The data gathered from the trials laid out at Nelliampathy, Pampadumpara and Ambalavayal were rejected as they showed high coefficient of variation. The data collected from the other centres are presented in Table 2.

Growth behaviour and durations of flowering and ripening phases of the varieties varied with the elevations of the testing centres from the mean sea level. Flowering duration of the varieties ranged from 43 days (IWP 532) to 63 days (M 276) at Attappady; 54 days (M 537, HW 135, HW 513, HW 535, HW 521, HW 515, HW 517, HW 536, HI 667, M 267 and Choti Lerma) to 73 days (M 276) at Madupatty; 41 days (HD 2135) to 55 days (M 276 and D 1839) at Peermade and 52 days (HW 2135) to 55 days (M 276 and D 1839) at Peermade and 52 days (HW 505) to 77 days (HI 687) at Vattavada. The effect of elevation and consequently, atmospheric temperature, was more pronounced in the duration of ripening phase. The periods of maturity, on an average of all the varieties, were 22.8 days at Attappady, 52 days at Peermade, 63.2 days at Vattavada and 64 days at Madupatty. Low moisture in the soil and high day temperature of the atmosphere reduced the vegetative and ripening phases at Attappady and Peermade which are situated at comparatively lower altitudes compared to Madupatty and Vattavada.

The mean yields of wheat were 3226 kg per ha at Madupatty, 702 kg per ha at Vattavada, 1248 kg per ha at Peermade and 1174 kg per ha at Attappady. This indicates that Madupatty has high potential for wheat cultivation. The highest yielder at this centre was Safed Lerma, recording 5119 kg per ha. This was equivalent to a productivity of 38.48 kg of grain per hectare per day. Choti Lerma ranked second with an yield of 4932 kg per ha, its productivity being 38.5 kg per hectare per day.

At Peermade, HW 517 was the top yielder (1997 kg/ha). The highest yielder at Attappady was HW 537 (1739 kg/ha). Unusual rains at the flowering phase adversely affected grain setting and therefore, the percentage of spikelet sterility was high in all the varieties at Vattavada. Very high organic carbon content (3.1 per cent) of the soil might be another reason for this phenomenon. The mean yields of the varieties ranged from 84 kg per ha (HW 524) to 1663 kg per ha only (Safed Lerma) at this location, though the vegetative growth was excellent (Table 2). The trials indicated that the climatic and edaphic conditions of Madupatty are highly favourable for wheat cultivation. The high yielding varieties Safed Lerma and Choti Lerma showed higher yield potentials at this location.

The trials also showed that wheat could be successfully grown at Attappady and Peermade.

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സംഗ്രഹം

ഉത്പാദനക്ഷമതകൂടിയ ഗോതമ്പിനങ്ങൾ കേരളത്തിലെ ഉയരംകൂടിയ firsgruosT, വയനാട്, ഹൈറേഞ്ച് മുതലായ പ്രദേശങ്ങളിൽ വിജയകരമായി കൃഷിചെയ്യാമോ എന്നതിനെപ്പറ്റി പരീക്ഷണങ്ങൾ നടത്തിയതിൽ fffflaosoerajTaggg മാട്ടുപ്പെട്ടിപ്രദേശം ഈ ഇനങ്ങൾക്ക് അനുയോജ്യമാണെന്ന് കണ്ടു. സമുദ്രനിരപ്പിൽനിന്നുള്ള ഉയരം കൂടുതലായ ഇവയുടെ മൂപ്പം വിളവ് വർദ്ധിക്കുന്നതായും കാണാൻ കഴിഞ്ഞു. എന്നാൽ പരീക്ഷണപ്പോട്ടുകളിൽ ഏറ്റവും ഉയർന്ന വിതാനത്തിലുള്ള വട്ടവടയിൽ പലകാരണങ്ങൾകൊണ്ടും വിളവ് മോശമായിരുന്നു. അട്ടപ്പാടിയും പീരുമേടും പുതിയ ഇനങ്ങൾക്ക് സാമാന്യം യോജിച്ച പ്രദേശങ്ങളായും കണ്ടു.

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