

Short Communication

Grain Losses of Wheat as Affected by Threshing Timings

S.K. AGHA, F.C. OAD AND M.H. SIDDIQUI†

Sindh Agriculture University, Tandojam-Pakistan

†*University College of Agriculture, Rawalakot, Azad Kashmir*

ABSTRACT

Grain losses of wheat (*cv.* Mehran-89) as affected by threshing timings were studied. The meteorological characteristics were slightly different during observation dates. The data revealed that grain losses were considerably affected by threshing timings; increased with late as well as early threshing. Minimum grain losses were recorded during middle of the day. Comparison of loss types indicated that the maximum were un-threshed followed by un-broking grain losses.

Key Words: Wheat; Grain; Threshing; Losses

INTRODUCTION

Wheat is preferred food amongst all the cereals in the world. Its cultivation in Pakistan is on large scale. The problems of harvesting, threshing and transporting have increased proportionately over the time. Threshing and winnowing are still carried out by traditional methods and by threshers in open threshing yards rather than combine harvesters.

Among the post harvesting losses, the threshing is one of the serious problem, which can affect the quality of wheat grain. Choudhry (1979) found that grain losses by threshing using bullock, mechanical, tractor and combine harvesting were 3.11, 2.68, 2.01 and 1.2%, respectively. Also it was pointed out that on an average 2.65% potential production was lost during harvesting and threshing operations. In Punjab province the wheat grain losses estimated 1.51 Lac tones in 1974-75. Tripathi (1979) reported that post grain losses occurred at various processing operations during harvesting, threshing, transporting and storage, which were 0.92, 1.68, 0.15 and 6.58%, respectively. Further Bukhari *et al.* (1983) reported grain losses during conventional harvesting, bundling, transporting, threshing, winnowing and cleaning were 3.67, 3.98, 0.24, 1.18, 2.46, and 4.53%, respectively and total average grain losses for conventional methods were 16.07%. Similarly, Devragani (1981) reported that total grain losses of traditional harvesting, threshing and cleaning of wheat were 19%. Buckingham (1979) concluded that wheat variety has greater effect on capacity and losses depending upon the cultivars. Harrington (1979) reported regarding a multi crop thresher having a spike tooth cylinder, the losses in wheat and paddy were 3%. The thresher was not suitable for making straw as it reduces 25-50% of original length depending upon cylinder speed and moisture conditions. The farmers of this area have a little knowledge about the post harvest grain losses of wheat, which occur and affect the quality as well

as quantity during threshing. Therefore, this study was carried out ascertain the losses occurring during various threshing timing on grain losses of wheat.

MATERIALS AND METHODS

The present study was carried out to evaluate grain losses influenced by threshing timings at Malir Farm Sindh Agriculture University Tandojam. Mehran-89 wheat variety on 10 hectares was harvested by Kubota reaper in first week of April. After sun drying, the harvested crop was transported to the threshing yard and threshing was started with Beco thresher from 15th to 24th April. The threshing timings were 3-7 am, 7-11 am, 11-15 pm, 15-19 pm, 19-23 pm and 23-3 am. For study of losses 5 kg of wheat straw was randomly taken from each heap and winnowed. The broken, un-broken grains, unthreshed ear heads were collected and again threshed the ear heads, winnowed, cleaned and weighed. Similarly 5 kg of grains were separately collected from each heap of grain and broken grains were separately collected in plastic bags and weighed for recording the data.

RESULTS AND DISCUSSION

The meteorological conditions were slightly different from each other during observation dates (Table I). The data regarding different agronomical traits of wheat variety Mehran-89 have been are presented in Table II. Result indicated that number of tillers per plant, spikes per plant, grains per earhead, length of earhead, number of plants per square meter and other traits were found normal.

The data in Table III revealed that grain losses in wheat variety Mehran-89 were influenced considerably by various threshing timings, and minimum losses were observed during middle of the day. The early as well as late threshing hours increased grain losses. Unthreshed grain

losses were greater during early and late threshing timings. Broken and unbroken losses in the middle of the day were found slightly less. The minimum losses were observed in middle of the day and drastically increased in both early and late threshing timing. By comparing types of losses the maximum were un-threshed losses which were observed in early and late threshing, timings followed by un-broken and broken. During threshing timing, un-threshing grain losses were less in middle of day and maximum during early and late threshing timings. Furthermore, the data demonstrated that all the grain losses were greater during early and late threshing timings. The grain losses observed by different timings are in accordance with the findings of Choudhry (1979), Tripathi (1979), Harrington (1979), Bukhari *et al.* (1989), Ibupota *et al.* (1991) and Devarejani (1981).

Conclusion and recommendation. Temperature and relative humidity were the major factors that affected the wheat grain losses during threshing. It is recommended that wheat threshing should be carried out in the middle of the day with proper adjustments to minimize the threshing grain losses.

REFERENCES

- Bukhari, S., J.M. Baloch and F.M. Ratter, 1983. Losses in wheat harvesting and threshing. *AMA Japan*, 14: 61-4
- Bukhari, S., K.A. Ibupoto, G.H. Jamro and M. Zafarullah, 1989. Grain losses of various wheat varieties harvested by power reaper. *AMA Japan*, 20: 17-8
- Buckingham, F., 1979. Looking at Combine Agricultural Engineering. *Compare rotaries and conventional models*, 1st 94: 16-20, 26, 58
- Choudhry, M.A., 1979. Wheat losses at the threshing and winnowing stages. *AMA Japan*, 10: 67-70
- Devragani, B.T., 1981. *Grain losses in Wheat Mechanized v/s Traditional Methods*, paper presented at second annual conventional of PSAE April-1-5.
- Harrington, R.E., 1979. Thresher principles confirmed with crop thresher. *Agri. Engg.*, 7: 49-61
- Ibupota, K.A., S. Bukhari, G.H. Jamro and F.M. Rattar. 1991. Field grain losses to wheat by conventional harvest and post harvest methods. *Pakistan J. Agric. Res.*, 12: 3153-8
- Tripathi, S.N., 1979. Status of post-harvest handling operations for food grain and proposed mechanization of grain market in India. *AMA Japan*, 10: 77-80

(Received 10 December 2003; Accepted 10 October 2004)

Table I. Meteorological data for the month of April, 1998

Observations	April dates 1998				
	15-16	17-18	19-20	21-22	23-24
Temp. max (°C)	39.1	37.9	39.0	38.9	38.8
Temp. min (°C)	32.9	33.1	33.9	32.6	32.4
RH (%)	39.5	38.6	39.1	32.8	32.9
Wind velocity (Canodes)	7.60	6.60	7.00	5.9	4.20
Sunshine (h)	10.4	10.3	10.4	10.5	10.3
Rainfall	-	-	-	-	-

Table II. Growth and yield traits of bread wheat (cv.Mehran-89)

Characters	Units
Plant height (cm)	85.63
Tillers per plant	8.00
Spikes per plant	6.00
Grain per ear head	53.00
Length of ear head (cm)	9.90
Plants per square meter	511.00
Seed index (g)	40.50
Grain yield per square meter (kgs)	0.29
Grain yield per hectare (kgs)	2900.00
Wheat straw yield (kgs)	3000.00

Table III. Post harvest grain losses (Threshing timings of bread wheat per 5 kg of straw)

Timings	UTG ¹ (g)	Loss (%)	BG ² (g)	Loss (%)	UBG ³ (g)	Loss (%)
3-7 am	55.59	1.11	15.56	0.31	35.46	0.71
7-11 am	53.05	1.06	14.65	0.29	30.55	0.61
11-15 pm	44.05	0.88	15.45	0.31	23.30	0.47
15-19 pm	44.05	0.88	15.45	0.31	25.96	0.52
19-23 pm	50.08	1.00	15.96	0.32	31.05	0.62
23-3 am	57.73	1.15	16.52	0.33	34.20	0.68

1, Unthreshed grains; 2, Broken grains; 3, Unbroken grains