



# Comparative Economic Benefits of Different Oat Varieties in Rainfed Areas of Pothwar, Pakistan

Sobia Naheed, Nusrat Habib, Muhammad Zubair Anwar, Saqib Abbasi and Saqib Siddiqui  
Social Sciences Research Institute, National Agricultural Research Centre, Islamabad, PAKISTAN

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## Abstract

The present study was designed to analyze the comparative economic benefit of different oat varieties in rainfed areas of Pothwar, Pakistan. It is based on sectional data collected through simple random sampling technique in April 2013 from 40 oat growing farmers. It is observed that PD2-LV65 and oat NARC varieties were commonly adopted by majority of the respondents in the study area. Data was collected on cost of production of these varieties and analyzed by using Minitab software. Net value of the produced and cost involved were estimated by estimating net benefits and cost benefit ratios of these selected varieties. Through analysis it was observed that "Oat NARC" variety was comparatively high yielding. The total cost of cultivating Oat NARC per acre of oat in rainfed area was 11250 rupees with gross revenue of 42750 rupees with net benefit of 31500 rupees. The benefits cost ratio was 1.35 of Oat NARC. While in case of PD2-LV65 variety the total cost of cultivating per acre of this variety in rainfed area was 10950 rupees with gross revenue of 28800 rupees and net benefit was 17850 rupees. The benefits costs ratio was 1.63 of PD2-LV65. This comparison showed that PD2-LV65 variety cost benefit ratio was higher than 1.35 cost benefit ratio of Oat NARC variety. Keeping in view the economic benefit of PD2-LV65 it is recommended to adopt this variety by large number of farmers and this intervention will provide them higher economic benefits which lead to improve their livelihood situation at farm level.

**Keywords:** Avena sativa, fodder yield, Oats, cost benefit ratio, net benefit, rainfed, pothwar, Pakistan.

## Introduction

Oats (*Avena sativa* L.) is an essential coldness season cereal fodder crop which can be profitably grown all over Pakistan under equally irrigated and rainfed circumstances with a rainfall of 400 mm and a most favorable temperature series of 16-32°C. It is an vital forage/green crop grown as a meadow, hay, silage and poultry feed in the world. It requires temperate and cool sub-tropical conditions for its growth. Its share in national GDP accounts by 20.9% and employing 45% of work force<sup>1</sup>. The area under various fodder crops in the country is estimated as 2.312 million hectares and annual fodder production 51.925 million ton. The average fodder production is 22.5 tons per hectare (t ha<sup>-1</sup>) which is as well low to meet even half of the preservation ration of 154.6 million heads of livestock in the country. In Pakistan, very little work on the development of fodder oat varieties has been undertaken<sup>2</sup>.

Oats (*Avena sativa* L.) are Asiatic in starting point and grade fourth in conditions of world production of cereals<sup>3</sup>. Forage oats are developed throughout Pakistan in winter under an extensive variety of soil and climatic situation. Oat is an imperative winter fodder, frequently fed as green but excess is changed into silage or hay to use for the period of fodder shortage stage<sup>4</sup>. Farmers have to face keen scarcity of green fodder in Pakistan during mid-November to mid-January when there are only dry stalks of dehydrated cereal fodders or dry summer grasses. Oat has inherited prospective to generate three-fold green fodder, that is

60 to 80 tones/ha and can feed double number of animals per item area as against the traditional fodder crops<sup>5</sup>. Many cultivars of oat have high feed value if cut at flowering stage or soon after it and can meet the demand of quickly growing livestock industry of Pakistan. Ideal variety is always one, which possesses general version with higher yield latent<sup>6</sup>.

Several growers of oat have high feed value if cut at flowering period or soon behind it and can assemble the demand of fast growing livestock manufacturing of Pakistan. Ideal variety is forever one, which acquires universal alteration with higher yield potential<sup>7</sup>. It is high in total edible nutrients (TDN), protein, fat, vitaminB<sub>1</sub> and minerals i.e. phosphorus and iron<sup>8</sup>. It is a preferred feed of all animals and the straw is soft and much better to wheat and barley. Keeping in view the shortage of green fodder, a field testing of one hundred and eight accessions of oats along with five typical varieties were under taken to appraise and recognize fitting genotypes for green fodder yield for Pakistan<sup>9</sup>.

NARC Oat is a new high yielding, tall, broad leaved, late fodder producing variety of oats. It is also forbearing to creature (aphid) and diseases (loose/covered smut, leaf spot and silky mildew). On the basis of yield trials and other agronomic characters as evaluated to check variety S-2000, the NARC suggested the new variety NARC Oat for farming at farmer field. It has been permitted by the Punjab Seed Council in 2011, for general cultivation in the rainfed areas of Potohar and irrigated areas of Pakistan<sup>10</sup>.

Hussain<sup>11</sup> deliberated yield and excellence components of 15 striking and native varieties of oats. They reported that highest mean fresh forage and dry material yields were attained from variety PD2LV65 while variety No.681 had higher rough thread content. In spite of the fact that our country is sanctified with a galaxy of climate, soil situation and irrigation water yield per unit area of a variety of crops are very low. Therefore, it is crucial to enlarge food and fiber production to cope up not only with ever growing requirements of the country, but also for the sake of unfamiliar exchange earnings and to conquer self-sufficiency<sup>12</sup>.

In Pakistan, very little work on the development of fodder oat varieties has been undertaken. Only 9 varieties of fodder oat have been developed since 1947<sup>13</sup>. The fitness of oats as a forage crop beneath diverse agro-climatic environment. Thus present study was carried out to estimate the cost and gross margins of oat production and the cost benefit ratio of oat variety for rainfall areas of Pothwar tract of Pakistan<sup>14</sup>.

**Objectives:** The objective of the study was to estimate the cost and gross margins of Oat production and to estimate the cost benefit ratio of Oat.

## Material and Methods

**Location of the Study:** The study was performed in the rainfed areas of the district Rawalpindi, in order to represent the whole rainfed areas of Rawalpindi.

**Selection of Sample:** The results would have been more precise, if the entire of the population had been studied. However 40 respondents were randomly interviewed from different villages of district Rawalpindi.

**Data Collection Techniques:** In order to get the full information, a questionnaire for the cost of production was framed with preset objectives and struggles were made to cover all the information required for the study. The questionnaire was the pretested and adjusted according to the feedback from the respondent, before actual survey was conducted. All the farmers were interviewed on their field.

**Data Analysis:** The collected data was passed in to the computer using the SPSS software, keeping the requirement of the study, expressive statistics was used to find the result, pronounced in new section.

**Evaluation of Costs and Incomes:** Net value of the twisted and cost implicated were projected. Cost of variables inputs such as labour, ploughing, disk ploughing, planking, seed, fertilizer, organic manure, returned and threshing were calculated. For the evaluation of gross income, the worth of invention (grains) during the year was taken in to the account. To calculate the net income the subsequent formula was used:

**Net Return:**  $NR = GR - TVC$ ,

Whereas, NR = Net return, GR = Gross return, TVC = Sum variable costs.

**Cost Benefit Ratio:** It is distinguished as the quantity established in the figure of proceeds on the costs of one rupee. The CBR was calculated by the methods<sup>15</sup>.

$CBR = NR/TVC$

Whereas, CBR = Represents costs benefit ratio, NR= Stands for net returns, TVC = Denotes total variable cost

## Results and Discussion

This section presents the finding of study that includes gross revenue, total variable cost, net revenue and cost benefit ratio of oat.

**Average Farm Size:** The average farm size of the participating household was ranged between 4 to 12 kanals. It shows that the selected families are poor and also belong to middle class. The erratic and uneven rainfall made their life more miserable. So in the unpredictable conditions, they cannot depend only on agricultural crops. These poor families mainly hand on both crops and small ruminants. Almost every household kept 2 or 3 animals to fulfill their domestic milk and cash needs.

**Major Crop Rotations:** Two types of fallow systems are predominant in barani areas. First was on year fallow system, land is fallowed for one year in drier areas to protect moisture and the other is seasonal fallow system. The major reasons for fallowing land were lack of moisture and risk due to drought. Continuous cropping produces lower yield and is not economically feasible. Indifferent provinces for the oat fodder production, it should be sown in mid-October to November. Oat is sown with wheat crop to fulfill the fodder shortage during that period. After that maize and ground nut is sown as food crop.

**Economic Analysis of Oat Variety PD2-LV65:** In case of Oat variety PD2-LV65 cost of ploughing, organic manure and seed per acre were, 2450, 1400 and 1400 rupees respectively. While fertilizer, and harvesting per acre cost were 3450 and 2250 rupees respectively. The total cost of cultivating per acre of oat in rainfed area was computed to be 10950 rupees with gross revenue of 28800 rupees. Net income of oat per acre was 17850 rupees. The benefits costs ratio was 1.63. These results implicit that Oat cultivation is very profitable enterprise in the study areas. Details are given in table 1.

**Economic Analysis of Oat NARC Variety:** In case of Oat NARC variety cost of ploughing, organic manure and seed per acre were 2150, 1400 and 2200 rupees respectively. While fertilizer and harvesting per acre cost were 3450 and 2050 rupees respectively. The total cost of cultivating per acre of oat in rainfed area was computed to be 11250 rupees with gross revenue of 42750 rupees. Net income of oat per acre was 31500

rupees. The benefits costs ratio was 1.35. These results implied that Oat cultivation is very cost-effective enterprise in the study areas. Details are given in table 2.

**Table-1**  
**Economic Analysis of Oat Variety PD2-LV65**

Items and units	Units	Amounts (Pak Rupee)
Inputs side		
Cost of ploughing	Rs./ac	2450
Organic manure	Rs/ac	1400
Seed	Rs/ac	1400
Fertilizer	Rs/ac	3450
Harvesting cost	Rs./ac	2250
Total cost of production	Rs./ac	10950
Output side		
Production	kg/ac	960
Returns from green yield	Rs./ac	28800
Profitability Analysis		
Gross benefit	Rs./ac	28800
Net benefit	Rs./ac	17850
Cost benefit ratio		1.63

Source: Field Survey 2012-13.

**Table-2**  
**Economic Analysis of Oat NARC Variety**

Items and units	Units	Amounts (Pak Rupee)
Inputs side		
Cost of ploughing	Rs./ac	2150
Organic manure	Rs/ac	1400
Seed	Rs/ac	2200
Fertilizer	Rs/ac	3450
Harvesting cost	Rs./ac	2050
Total cost of production	Rs./ac	11250
Output side		
Production	kg/ac	1050
Returns from green yield	Rs./ac	42750
Profitability Analysis		
Gross benefit	Rs./ac	42750
Net benefit	Rs./ac	31500
Cost benefit ratio		1.35

Source: Field Survey 2012-13.

**Comparative Economic Benefits of Different Varieties:** PD2-LV65 variety of NARC was producing proficiently by farmers and they were in good economic situation by growing this variety in evaluation to those farmers who producing Oat NARC 2010 variety on their farms. Gross returns as well as net returns and farmers' margin were higher in growing PD2-LV65. The cost of production of PD2-LV65 was lower expenses on the part of farmers but at the same time it yielded also lower but in case of Oat NARC the cost of production is higher and its yield also higher as compare to PD2-LV65. So, the cost benefit ratio of PD2-LV65 and Oat NARC were 1.63 and 1.35 respectively

which is clearly indicated that PD2-LV65 is more valuable for farmers for improving their economic conditions.

## Conclusion

The ultimate objective of this study is to promote oat crop and increase income of the marginal growers. It is only possible by increasing per acre yield of crops particularly the high value cash crops. In journal observation majority of the farmers were preferred oat variety PD2-LV65 due to high grain yielding and fodder production. It is clearly indicated from the observed results that oat crop has prospective to improve socioeconomic conditions of the rural masses. The current oat crop management practices needs instantaneous consideration of the stakeholders to popularize use of agriculture machinery at farm level. This interference will save farmers time, precious resources and ultimately provide them resources to improve their farming activities. Government should announce support price for oat to encourage the oat growing society to improve fodder for the livestock.

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