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## Off-Season Pea Cultivation in Dir Kohistan Valley

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**Abstract:** An experiment to screen out suitable pea cultivars for summer cultivation in Dir Kohistan Valley was conducted in May-August, 2001. All the parameters were found statistically significant except the germination percentage. Cultivar Rondo produced maximum yield (6.73 tons ha<sup>-1</sup>), highest number of pods/plant (16.8) and took minimum days (48) to maturity while cultivar Climax produced (4.78 tons ha<sup>-1</sup>), 12.6 pods per plant and maximum number of grains (8.48) per pod.

**Key words:** Pea cultivation, Dir Kohistan Valley, off-season

### Introduction

Pea (*Pisum sativum L.*) is a well known vegetable of the temperate region, which belongs to family leguminoceae. It originated in four possible centers i.e., Abyssinia, Mediterranean, Near Eastern and Central Asian regions. However, the present day commercial pea cultivars are the results of hybridization in England in 1787 by Thomas knight (Gendars, 1972).

Pea is an annual herbaceous plant with climbing habit. It is a cool season crop therefore, confined to cool temperate zone. There exist a lot of variation in pea cultivars for different plant characteristics like height, maturity, yield, color and quality of fruits etc. Cultivars also vary in the adoptability to certain agro-climatic conditions. Pea crop requires a well drained loosen soil provided with FYM @ 20-25 t ha<sup>-1</sup>. It also needs fertilizer @ 45 kg ha<sup>-1</sup> N, 90kg ha<sup>-1</sup> P<sub>2</sub>O<sub>5</sub> and 90kg ha<sup>-1</sup> K<sub>2</sub>O. Seed rate for early crop 100-120 kg ha<sup>-1</sup> while for late crop 80-90 kg ha<sup>-1</sup> is recommended (Baloch, 1994).

Pea is an excellent human food, either eaten as a vegetable or in soup. Cooked green peas are a rich source of protein. One pound (0.45 kg) of green peas has 13.7 gm protein, 0.8 gm fats and 37.1 gm carbohydrates, 45 mg calcium, 249 mg phosphorous and 45 mg ascorbic acid (Khan, 1994).

The pods having seeds are usually harvested at a young, succulent stage and the seeds are shelled from the pods, and eaten after boiling. Presently our consumption of vegetables is approximately 20 kg per capita per year which is 1/5th the consumption in advanced countries. High rate of population is putting further pressure on the available supplies. Availability period of most vegetables are very short. They are surplus in the peak season and become scarce as the season vanished. Price variation/inflation rate during on and off-season are also very high which affect both the growers and consumers. The need is to initiate a resultoriented research for off-season vegetables production.

Many researchers have conducted experiments on peas keeping in mind its importance. Shuja and Zaman (1975) reported that in a varietal trial FC-3954 produced heaviest pod as compared to all other varieties of peas. The varieties exhibited differently for various characters. Lines Small Sieve, Freezer, H-57 and FC-3954 gave maximum number of plants while lines P-35, P-8 and Blue Bantam produced more profused plants. Line P-35 gave significantly tallest plants.

Haq *et al.* (1997) conducted an experiment to screen out suitable pea cultivars for spring cultivation at Chitral. Four cultivars, Meteor, Climax, Green Feast and No.26 were tested. Cultivar Meteor gave significantly higher yield (6745 kg ha<sup>-1</sup>), number of grains per pod (8.00) than other cultivars. Number of days to maturity (41.220) and plant height (47.60) was also significantly lower than other cultivars.

Zaman *et al.* (1987) studied various pea varieties and found significant differences in their days to flowering, average number of seed/pod and the fresh pod yield per hectare. Variety Alaska was found early which took 31 days to flower. Maximum number of 9 seed/pod was noted in the variety "Alderman". However the highest yield of 7.5 and 10.4 tones ha<sup>-1</sup> were obtained from the variety "Early protection" in 1980-81 and 1982-82 respectively.

Poma and Zora (1993) tested four introduced varieties for their adaptation to hilly environment for Sicily, all showed good adaptation. Belinda was the best, showing highest yield per plant (5.6 g) and 1000 seed weight (20 g). Its seed yield /unit area was 3.6 t ha<sup>-1</sup> in 1989 and 4.2 t ha<sup>-1</sup> in 1990.

Shrma (1993) conducted field trials in the hills of Uttar Pradesh during 1980-83. They found that higher rainfall and lower temperature during March-April provide adverse conditions for the powdery mildew pathogen, *Erysighe pisi*, so that early sowings escape damage by the disease.

Ishtiaq *et al.* (1996) tested the performance of exotic pea cultivars in Peshawar Valley. They observed maximum germination (92%) and longest pods (8.535 cm) in Myfare, whereas minimum germination (54.50%) and smallest pod size were recorded in cv. VIP. As regard the flowering and final harvesting cv. Am-I was found to be the earliest, which took 44 and 129 days to flower and final harvesting. Almata took more days to flowering (84.50) while carvella took the longest period of time to final harvesting (188 days). Cultivar Green Sward produced maximum plant weight (159.2 g) and pod yield (5950 kg ha<sup>-1</sup>).

Nature has bestowed Pakistan a variety of agro-climatic conditions. Out of which certain hilly areas are suitable for off-season vegetables production. The need is to identify such natural pockets suitable for off-season cultivation. One of such blessing is the Dir Kohistan valley which lies in Dir sub division of upper Dir Dist. The length of the valley is about 130 km and has an area of 167032 ha, out of which 8.2% (13731 ha) is under agriculture. Maize and potato are major crops of the area. There are two crops of potato, spring and summer, which are grown successively one after another. It was once very economical but made their potato crop diseased and diseased with the rolling of years. It is now a general apprehension that if the same cropping pattern persists, it would be difficult to obtain a healthy potato crop in times to come. This research work was carried out in Dir Kohistan valley to see the possibility of off-season pea cultivation in the valley and to bring the existing cropping pattern in rotation with good alternative.

#### Materials and Methods

This experiment was carried out in Dir Kohistan valley in summer 2001 to see the suitability of off-season pea cultivation in the valley. The experiment also aimed at to determine which of the three cultivars Navona, Rondo and Climax are well adapted to the area. RCB design was used and each cultivar was replicated three times in a sub plot size of 5x2.4 m<sup>2</sup>. Farm Yard Manure was applied @ of 1000 kg ha<sup>-1</sup> before sowing while DAP @ 250kg ha<sup>-1</sup> at the time of sowing. The first irrigation was given immediately after sowing, second irrigation at after a week and subsequent irrigations at an interval of 10 days. Other cultural practices were carried out at proper time. Data on Germination % Pod Length (cm), Number of grains/pod, Number of Pods/plant, Number of days to first harvesting and Yield (t ha<sup>-1</sup>) was recorded.

#### Results and Discussion

The data regarding Germination % Pod Length (cm), Number of grains/pod, Number of Pods/plant, Number of

days to first harvesting and Yield (t ha<sup>-1</sup>) is presented in the Table 1.

**Germination percentage:** Non –significant difference was recorded among the varieties with regards to germination percentage. Maximum germination (91.40%) was observed in cultivar Navona followed by Climax (86.76%) and Rondo (85.76%). The high germination may be due to the genotypic characteristics of the cultivars plus environment interaction. Germination increases with increase in temperature as reported by Thompson and Kelly( 1982).

**Pod length:** Significant difference was recorded among the three varieties in regard to pod length. Cultivar Rondo produced the maximum pod length (9.25 cm) followed by Climax with (6.40 cm) while Navona produced smallest pod with 5.65 cm. Similar results were obtained by Haq *et al.* (1997).

**Number of grains per pod:** Cultivar climax produced maximum number of grains/pod (8.48), which is significantly different from both Rondo (6.15) and Navona (5.6) number of grains per pod, respectively. Cultivar Navona and Rondo were not significantly different from each other. Number of grains per pod is an important yield component and contributes to the final yield. It may be due to the genetic characteristic or environmental unsuitability, which may hinder the process of pollination, fertilization or cause abortion of the embryo.

**Number of pods per plant:** Maximum number of pods was produced by cultivar Rondo (16.8) followed by climax with (12.6) pods per plant which were significantly different from each other but both were non-significant to Navona having minimum (9.8) number of pods. Number of pods per plant depends on the genotype and environmental conditions. Less number of pods/plant may be due to the reason that in off-season pea plants take less number of days to maturity attaining less vegetative growth or plant height and subsequently having less number of pods/plant.

**Number of days to first harvesting:** All the three cultivars were significantly different from each other in respect to number of days taken to first harvesting. Minimum days (48) were taken by cultivar Rondo and was declared as early, followed by climax with (62) days while cultivar Navona took the maximum number of days (75). The results are in line with Ihsan-ul Haq *et al.* (1997).

Table 1: Performance of Pea Cultivars in Dir Kohistan Valley

Cultivar	Germination (%)	Pod length	Number of grains/pod	Number of pods/plant	Days to first harvesting	Average yield(t ha <sup>-1</sup> )
Novana	91.40A	5.65B	5.60B	9.8B	75A	2.07B
Rondo	85.76A	9.25A	6.15B	16.8A	48C	6.73A
Climax	86.76A	6.40B	8.48A	12.6AB	62B	4.78A

Results not followed by the same letters are significantly different at 5% level of probability

**Average Yield (t ha<sup>-1</sup>):** To get higher yield is the ultimate goal of every researcher. Highest yield (6.73 t ha<sup>-1</sup>) was produced by Rondo, which was non-significant to climax with (4.78 t ha<sup>-1</sup>) but both were significantly different from Navona with lowest yield (2.07 t ha<sup>-1</sup>). The lower yield of cultivar Navona is due to the fact that it was a late maturing variety and was not yet mature when the hot season started. The results are in agreement with Boswell (1929), who reported that as temperature during the growing season rises the yield drops off rapidly. Cultivar Rondo produced high yield because it was early maturing and matured before the commencing of hot weather. Apart from that maximum number of pods per plant and longer pod size were other factors attributing to its maximum yield.

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Swat valley farmers were helped to establish plots in four locations and taught to cultivate ten medicinal and aromatic plants (MAPs). In the first year, workshops were held on the financial benefits of growing MAPs for trade, criteria in selecting species, and strategies to improve MAP yield. Offering training in collection, preservation, and marketing can enhance the financial return and the long-term benefits of cultivation. Introduction of standardized production technology and appropriate post-harvest management has become a prime engine of growth for the economies of the subsistence farmers participating in our study, and is leading to better management and conservation practices for MAPs and the landscapes in which they grow. Keywords. Strawberry cultivation. By Dr. Ali Muhammad Khushk and Aslam Memon. Pakistan is producing a limited quantity of strawberries which are either eaten or used in preparing ice-cream, jam, jelly, pickle, cake or milk shake. The fruit fetches Rs100 to Rs120 per kg in big cities. The wholesale price of the fruit comes down to Rs 50 per kg during the second fortnight of March when the crop production touches its peak. Early spring is an ideal time for planting as it ensures good development for increased productivity the following season. Fall planting is not recommended due to greater problems with weed control and the cost of winter mulch. The number of plants needed per acre depends upon the spacing system used. Noor Habib and Muhammad Zamin, 2003. Off-Season Pea Cultivation in Dir Kohistan Valley. Asian Journal of Plant Sciences, 2: 283-285. DOI: 10.3923/ajps.2003.283.285. Table 1: Performance of Pea Cultivars in Dir Kohistan Valley. Results not followed by the same letters are significantly different at 5% level of probability. Average Yield (t ha<sup>-1</sup>): To get higher yield is the ultimate goal of every researcher. Highest yield (6.73 t ha<sup>-1</sup>) was produced by Rondo, which was non-significant to climax with (4.78 t ha<sup>-1</sup>) but both were significantly different from Navona with lowest yield (2.07 t ha<sup>-1</sup>). The lower yield of cultivar Navona is due to the fact that it was a late maturing variety and was not yet mature when the hot season started.