

INTRODUCTION OF *PIMPINELLA ANISUM* (ANISEED) TO JUDGE ITS PERFORMANCE AND EFFECT OF VARIOUS ROW TO ROW SPACING ON THE GROWTH AND SEED YIELD

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Introduction

Aniseed is one of the oldest spice which has been cultivated as a specialised crop over vast areas in Egypt, Asia minor, India and Southern Europe for commercial utility of its seed and essential oil which find a variety of uses in various industries. The fruits form an article of commerce and are extensively used by bakers and confectioners to flavour their products. Aniseed on distillation yield 2 to 3.5% essential oil, which contain 80 to 90% anethole, an important estrogenic agent used for the treatment of millennia. The bulk of oil is used in medicine, perfumery, soap and other toilet articles. The distilled water of aniseed is also used by Hakims as carminative to relieve flatulence and for the successive control of cholera. In certain European countries the young leaves and shoots of the plant are used as garnish and for flavouring salad. Pakistan is importing aniseed and essential oil from Iran to meet the local requirements of food processing and allied pharmaceutical industries and the demand is on the increase.

Keeping in view, its economic importance and variety of uses, introduction and cultural trials were conducted for two consecutive years at Medicinal Plants Farm of P.F.I. Peshawar to ascertain its adaptability and suitable row spacing in order to get optimum seed yield and to judge the feasibility of its commercial exploitation.

Material and Method

Seeds of *P. anisum* was procured from local drug market. The experiment was set up in a complete randomised block design replicated five times to test the effect of different row spacings i.e., 20, 30, 40 cms and broadcasting on the seed yield. The plot size was kept as 34 m². Seed @ of 68 gm/plot (basis 20 kg seed/ha) was sown during the middle of September at different row spacing according to the lay out plan. First irrigation (10 cm) was provided immediately after sowing and 6-subsequent irrigations at an interval of fourteen days were given to the crop upto the end of April every year, providing a total depth of 70 cm. In addition 223 mm average rain was received annually. The crop received a uniform dose of 40 kg N/ha, applied in two split doses. First half dose was given as side dressing in January, while the second half dose was applied a month later. Two hoeing and weedings were given during November and January. The crop was harvested when the tip of fruits assumed greyish green colour. Seed yield was recorded in kg/plot after threshing and winnowing.

Results and Discussion

Seeds sown in September germinated very slowly and required a dormant period of

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atleast 2 - 3 months prior to complete germination in the field. At the end of frost season the plant made luxuriant growth and attained a height of 1 to 1½ metre under Peshawar climatic conditions. The plant started producing white umbels in March which continued upto the middle of April and later on fruits formation took place. The crop matured in the 1st week of May. Seed yield recorded under various spacing treatments is given as below:

Comparative effect of various row to row spacings
on the seed yield of *P. anisum* in kg/plot
(34 m²)

Treatment (spacings)	Mean seed yield in kg/plot		Mean
	1980-81	1981-82	
20 cm	4.725	5.286	5.005
30 cm	5.135	5.791	5.463
40 cm	5.951	6.355	6.153
Broadcasting	4.687	5.209	4.948
LSD 5%	0.650	0.736	
LSD 1%	0.894	1.032	

A row to row spacing of 40 cm resulted in a significant increase in the seed yield (1809 kg/ha) as compared to other spacings i.e., 30, 20 and broadcasting during two consecutive year of trials. No significant difference was observed in the mean seed yield of 20 cm row to row spacing and broadcasting respectively.

In order to estimate the ratio of biomass (dry matter) with seed yield, dried stem, roots were weighed (kg/plot) during May, 1982. The percentage of biomass (dry matter) was determined to be 81.24% while that of seed was 18.76% of the total dry matter. It was further observed that seed yield increased in 40 cm row spacing due to vigorous vegetative growth and formation of more number of umbels as compared to other spacings.

Economic aspect of growing aniseed

Average seed yield under different treatment was calculated to be 1.5 tonne/ha.

Gross income from the sale of 1.5 tonne of seed @ of Rs. 8 per kg.	Rs.	12,000.00
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Cost of cultivation (including land rent) @ of Rs. 1500/annum	Rs.	4,000.00
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Net income	Rs.	8,000.00
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Aniseed cultivation is an economically feasible proposition and it can provide a net cash income of Rs. 8000/ha, to the cultivators in a season.



Pimpinella anisum in flowering stage at Medicinal Plant Farm, Peshawar.

Conclusion

Spacing trials conducted for two consecutive years, revealed that plant spaced at 40 x 5 cm. resulted in a significant increase in the seed yield (1.80 tonne/ha) as compared to other spacings under irrigated conditions. The crop can provides a very reasonable return to the cultivators, if there is stable demand in the market. Therefore cultivation of aniseed in the irrigated areas is recommended to the farmers growing medicinal and other specialised crops.

INSECT-RESISTANT PINE HEAVILY DAMAGED BY A LEEPER

Blue pine (*Pinus wallichiana*), a beautiful tree of high hills in Pakistan, well known for its resistance against insect pests fell prey to a very robust 10 cm long ugly looking leeper, identified as *Biston regalis* Moore. The measuring worm (Geometridae Lepidoptera), absolutely unknown before, appeared all of a sudden in blue pine forests of Murree (50 km from Islamabad) and Azad Kashmir and ravaged large areas during 1980 killing tens thousands trees of all ages by complete defoliation. Having an annual life cycle the pest hibernates as pupae in the soil, emerging in May/June as adult moths and voraciously devouring blue pine needles from July to October.

The resistance to insect pests prevalent in blue pine was factually not an inherent characteristic of the tree. It was rather the magic of the biotic equilibrium of the undisturbed natural eco-system exercised by a strong complex of bio-control agents, the parasites and predators. During the past half a decade a large scale repeated sprayings of various toxic insecticides against codling moth on apples took a heavy toll of insect friends of man, the parasites and predators resulting in the withdrawal of strong natural checks and free multiplication of insect pests. Blue pine defoliator is one of those many insects which became serious problems in the field of forestry and agriculture as a result of indiscriminate spraying in the area.

In order to combat this menace use of toxicants, apart from being expensive and impracticable in hilly terrain during monsoon rains, would have further aggravated the situation by spoiling bird fauna wildlife and the remaining natural enemies of insect pests. The most effective and long lasting method was to augment the natural enemies of the pest so that the disturbed biological balance is set back in position to exercise for natural check again. In this context large scale mechanical collection of hibernating pupal population was made from all over the affected areas and put in wire-gauze cages on the peripheries of the defoliated patches so as to hold back the large sized adults of the pest and let the parasite/predator adults go back to the field. The method proved such a surprise that in Murree the pest was over powered by the natural enemies in the initial stages and no further damage to the crop occurred. In Azad Kashmir due to defective and partial application of the same method the pest was brought under complete control in the next year. The expenditure on this method was unimaginably low i.e. Rs. 40/- per acre (1981) or US\$ 8 per hectare.

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