

Knowledge level of sunflower farmers under public and private extension systems

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ABSTRACT

A test was constructed to measure the farmers' knowledge level on sunflower cultivation and administered to 183 and 167 farmers under public and private extension systems, respectively. The farmers were selected from Chikballapur, Kadapa, Nizamabad and Raigarh districts of Karnataka, Andhra Pradesh, Telangana and Chhattisgarh states. The item analysis indicated significant differences in knowledge level of farmers on best season to grow sunflower crop, most suitable period of sowing sunflower crop during *Rabi*, suitable sunflower hybrids, application of fertilizers and bee keeping increases yield in sunflower under public and private extension systems.

Keywords: Extension, Farmers' knowledge, Sunflower practices

Sunflower oil is quite popular as healthy cooking oil because of its nutritional benefits. In India, it is cultivated over an area of 2.90 lakh ha with a production of 2.36 lakh t and productivity of 0.9 t/ha (Directorate of Economics and Statistics, 2020-21). The production of sunflower crop is low in India and the major reasons being rainfed cultivation, small operational land holdings, losses due to pests and diseases, and low knowledge level and low adoption of improved technologies by farmers. Knowledge plays an important role in adoption of improved technologies and popularization of the crop. Farmers access knowledge on sunflower cultivation through various sources. These sources were categorized into public and private extension systems and a knowledge test was administered to farmers covered by the two systems to understand their level of knowledge on different aspects of sunflower production technology.

METHODOLOGY

A knowledge test was developed based on the guidelines of Sureshverma *et al.*, 2018 and administered to farmers covered by public (183 nos.) and private (167 nos.) extension systems in Chikballapur, Kadapa, Nizamabad and Raigarh districts of Karnataka, Andhra Pradesh, Telangana and Chhattisgarh states, respectively. The data were analyzed using frequency, percentage and Z-test.

RESULTS AND DISCUSSION

It was observed that farmers' under public extension had more knowledge on sunflower production technology compared to farmers' under private extension system. There were significant differences ($p < 0.01$) in knowledge level between farmers of public and private extension systems on most suitable period of sowing sunflower, suitable hybrids, application of boron and bee keeping,

best season to grow sunflower crop ($p < 0.05$), application of fertilizers ($p < 0.05$), management of pests and diseases ($p < 0.05$). The knowledge level of farmer under public and private extension systems were similar with respect to suitable soils for cultivation of sunflower, seed treatment and time of harvesting. Similar results were done by Kumar *et al.*, (2016) and Sureshverma *et al.*, (2018).

Farmers availing the public extension services had higher levels of knowledge compared to private extension services mainly due to lower involvement of private sector in extension services related to sunflower as the sunflower farmers were not ready to pay for the services. The services offered by the private extension were limited to sale of hybrid seed and the plant protection chemicals. Very limited activities related to capacity building of farmers were undertaken by the private extension system. Further, based on the study it is suggested to have a pluralistic extension services for the benefit of farmers. The private extension system can take care of supply of quality seed and other critical inputs and the public extension system can concentrate on capacity building of farmers in improving the knowledge level and enhancing the adoption of improved technologies.

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Table1: Knowledge level of Public and private extension system farmers

Items	Public F (%) n=183	Private F (%) n=167	Z-value
What type of soil is suitable for sunflower cultivation	139 (75.9)	123 (73.6)	0.49 ^{NS}
What is the best season to grow sunflower crop	142 (77.6)	115 (68.9)	1.84*
What is the most suitable period for sowing sunflower crop in <i>Rabi</i> ?	149 (81.4)	117 (70.0)	2.48**
Can you name any hybrid of sunflower _____	132 (72.1)	101 (60.5)	2.2**
Do you know about seed treatment? If, yes give the details. Name and Quantity (g/kg)	139 (75.9)	119 (71.3)	0.99 ^{NS}
Do you know about chemicals for seed treatment?	137 (74.9)	121 (72.5)	0.51 ^{NS}
Do you know the seed rate of sunflower/acre?	137 (74.9)	124 (74.3)	0.13 ^{NS}
What is the critical period of weed competition in sunflower? Days	136 (74.3)	118 (70.6)	0.76 ^{NS}
What is the recommended dose of NPK for sunflower under rainfed conditions? Rainfed- N: kgs/acre, P : kgs/acre, K:kgs/acre	141 (77.0)	106 (63.5)	2.78*
What is the recommended dose of NPK for sunflower under irrigated conditions? Irrigated- N: gs/acre, P :kgs/acre, Kkgs/acre	139 (75.9)	125 (74.9)	0.24 ^{NS}
Do you know application of Boron improves seed yield and seed weight?	141 (77.0)	109 (65.3)	2.44**
List out any three important pests which cause major damage to crop and mention their control measures Pest Name Controlling Measures	145 (79.2)	116 (69.5)	2.09*
List any three important diseases which cause major damage to crop and mention their control measures Disease Name Controlling Measures	134 (73.2)	108 (64.7)	1.73*
Do you know that honeybee hives in sunflower crop increases production?	152 (83.0)	114 (68.3)	3.24**
Can you mention the correct stage of harvesting sunflower crop?	155 (84.7)	131 (78.4)	1.5 ^{NS}

* = Significant at 0.01 level of probability; ** = Significant at 0.05 level of probability and NS = Non-significant

Competitive interspersed staminate flowers in females: A problem in hybrid seed production of castor

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ABSTRACT

The *in vitro* pollen germination study was carried out by using pollens of six genotypes which included two popular hybrids, two female and two male parents viz, DCH-177, ICH-66, DPC-9, SKP-84, DCS-9 and ICS-164 to know the competitiveness of interspersed staminate flowers (ISF). The standardized medium containing 15% sucrose, 0.01% H₃BO₃, 0.3% Ca(NO₃)-4H₂O, 0.0214% Mg (SO₄)7H₂O and 0.01% KNO₃ were used in the study. The results revealed that highest % of pollen germination observed with ISF pollens of female parents (DPC- 9: 57.35% and SKP- 84: 44.51%) in both the hybrids compared to their respective male parents (DCS-9: 47.24% and ICS-164: 27.27%). It indicated the importance of rouging of ISFs in order to maintain the high genetic purity in castor hybrid and parental seed production.

Keywords: Castor, Hybrid seed production, Interspersed staminate flowers (ISF)

Castor (*Ricinus communis* L.) is a non-edible oilseed crop extensively cultivated for bio-based raw material for wide industrial applications. Despite belonging to monotypic genus, castor shows high sexual polymorphism and highly unstable pistillateness. The reversed pistillate lines serves as a source of pollen during the hybrid seed production which affect the genetic purity (85%) for certification. In order to maintain the high genetic purity as well as to reduce the cost of rouging operations, we need to understand the competitive nature and fitness of

pollen produced by ISFs of pistillate lines over the male flowers of monoecious lines.

MATERIALS AND METHODS

The *in vitro* pollen germination study carried out by using pollens of six genotypes which includes two popular hybrids, two female and two male parents viz, DCH-177, ICH-66, DPC-9, SKP-84, DCS-9 and ICS-164 to quantify fitness of the pollen grains produced by ISF over