Black gram (*Vigna mungo*) seed production: an approach towards food security and income generation

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ABSTRACT

The main focus of the present study was to assess effect of seed production under seed hub programme on income, yield and constraints faced by the black gram seed growers in Trichy and Karur districts of Tamil Nadu. Interviews and focus group discussions were conducted involving ninety respondents randomly selected from the selected districts. It was found that the improved variety was preferred most by the respondents (57%) as compared to local (24%) or intermediate (18%) variety. Farmers got an additional yield of 50.0 per cent through seed production though the production cost was higher (33.1%). They realized gross income of 72.5 per cent and net income of 87.5 per cent more than the normal cultivation. As a result the benefit-cost ration was 50.0 per cent higher. The four factors (credit facility, market price, value addition, extension visit and management practices) were most important determining factors deciding profitability of seed production. The high labour demand was biggest constraint faced by the growers followed by market uncertainty and procurement whereas pest and disease incidence was the least important constraint for them.

Keywords: Black gram; variety; seed production; income; constraints

INTRODUCTION

Seed is widely recognized as a vital input for efficient crop production. Quality seed is one of the major bottlenecks hampering the production and productivity of crops. It is the basic genetic unit responsible for maintenance and multiplication of plant population. For effective production farmers require seeds with the right and desired qualities in sufficient quantities at the right time and at affordable price. This boosts productivity of the local farmers, alleviate poverty and improve the livelihood of rural households and enhance the economy of farmers (Umar et al 2014). The vital role of seed in boosting agricultural production is well recognized by agricultural scientists, farmers and development workers (Tsegaye 2012).

Seed quality comprises many aspects where four key attributes are explicitly identified viz genetic, physical, physiological and health quality. However seed quality can be affected by environmental conditions under which the crop is grown and the cultural practices are used for production. Maintaining seed quality is essential if the variety is to meet the expectation of farmers and consumers. Seed producers should be aware of the technical and regulatory requirements for growing a crop for seed and ensure that all operations are carried out strictly under specific guidelines in a timely fashion (Bishaw et al 2007).

Black gram (*Vigna mungo*) is one of the important pulse crops grown throughout India. It is consumed in the form of Dal (whole or split, husked and un-husked) or perched. Black gram is used as a nutritive fodder for milch cattle and plants are also used as green manure which improves soil health and adds nutrients into the soil. India is the largest producer (25%) of world's production and consumer (27%) of total pulses of the world. The domestic production is often less than the estimated demand ie 23-24 MT. Thus the average gap of 05 MT is met through imports. As regards the total contribution from states, Madhya Pradesh stands first in respect of area (19.40%) followed by UP (17.88%) and Andhra Pradesh

(11.69%) whereas in production UP stands first (16.98%) followed by Andhra Pradesh (16.75%), Madhya Pradesh (15.07%) and Tamil Nadu (10.93%) (Tiwari and Shivhare 2016).

In line with the above GoI-NFSM launched a scheme on creation of seed hubs for increasing indigenous production of pulses in India for seed production through farmers to provide good quality seed to farmers at affordable price and within the shortest possible distance taking care of the issues of availability, accessibility and affordability. Seed production was enlightened on the superior attributes of black gram with improved and released varieties in relation to their (farmers') local varieties to the farmers. The interested farmers were trained on the foundation and certified seed production. The study was to describe the perceived superiority of improved seed varieties in relation to local varieties, determine the profitability of improved seed production enterprises, ascertain the socio-economic factors affecting profitability of seed production enterprises and identify the constraints militating against seed production in the study area.

METHODOLOGY

The present study was conducted by ICAR-Krishi Vigyan Kendra, Sirugamani, Tiruchirappalli, Tamil Nadu where the GoI-NFSM scheme on creation of seed hubs for increasing indigenous production of pulses in India was launched through Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Cooperation and Farmers Welfare (NFSM Cell), New Delhi through ICAR- Agricultural Technology Application Research Institute, Bengaluru during 2016-17. Seed production programme on black gram was implemented in Trichy, Karur, Pudukottai and Perambalur districts of Tamil Nadu.

Farmers involved in seed production were selected for this study based on their involvement and experience in seed production. A preliminary survey of the farms and farmers was carried out during the production season by a multidisciplinary team of researchers during which a focus group discussion (FGD) was conducted with the participating farmers. This formed the design of interview schedule used for data collection during May 2018. Stratified random sampling method was used to select 90 farmers from two districts namely Trichy and Karur. An expense involved in seed production was calculated to get benefit and cost and the differences were expressed in percentage. To determine the factors influencing the profitability of seed production enterprises in the study area results were arranged as low, medium and high based on the number of respondents and their expressions. To triumph the constraints in seed production enterprises in the study area constraints were ranked from I to X. Accordingly the respondents were grouped on the basis of percentage. It was hypothesized that household size, land size, income, number of extension visits, sources of agricultural inputs, harvesting and post harvest activities influenced the profitability (in average rate of returns) of agricultural seed production enterprises in the study area.

RESULTS and DISCUSSION

Preference for improved black gram variety

Table 1 indicates that the improved variety was preferred most by the respondents (57%) as compared to local (24%) or intermediate (18%) varieties. The improved variety was preferred for the traits like pest and disease resistance, grain yield, low input requirement, climate variation resistance, time of maturity, ease of processing during harvesting, socio-cultural compatibility and market price whereas the local vairiety was preferred for accessibility and availability of seed. It might be due to synchronized flowering, less incidence of yellow mosaic virus and non-shattering of grain compared with local or old black gram variety. Chindi et al (2017) reported that improved crop varieties were widely recognized as fundamental input for ensuring increased production and productivity.

Profitability of improved seed production

The gross return (GR) is the total income accrued to the farm from the seed production enterprise. It consists of the monetary value of all products and by-products. Farmers got an additional yield of 50.0 per cent through seed production though the production cost was higher (33.1%). They realized gross income of 72.5 per cent and net income of 87.5 per cent more than the normal cultivation. As a result the benefit-cost ration was 50.0 per cent higher (Table 2). It might be due to the reasons that farmers received consecutive trainings on integrated disease and pest management as well as postharvest handling of the black gram seed. Similar observations were made by Chindi et al (2017).

Table 1. Distribution of respondents on the basis of preference for improved black gram variety

Component	Respondents (%)		
	Preference for local variety	Intermediate	Preference for improved variety
Pest and disease resistance	12	24	64
Grain yield	30	22	48
Low input requirement	18	26	56
Accessibility and availability of seed	42	34	24
Climate variation resistance	42	10	48
Time of maturity	12	18	70
Ease of processing during harvesting	4	10	86
Socio-cultural compatibility	30	16	54
Market price	30	6	64
Average	24	18	57

Table 2. Comparison of benefit-cost ratio of seed production and normal cultivation techniques in black gram

Component	Normal cultivation	Through seed production	Additional income through seed production (%)
Yield obtained (kg/ha)	562	1125	50.0
Production cost (Rs/ha)	21750	32500	33.1
Gross income (Rs/ha)	30910	112500	72.5
Net income (Rs/ha)	9160	73000	87.5
Benefit-cost ratio	1.42	2.84	50.0

Factors influencing profitability of seed production

The factors influencing profitability of seed production are shown in Fig 1. The four factors (credit facility, market price, value addition, extension visit and management practices) were most important determining factors deciding profitability of seed production. Similar findings were observed in maize seed production by Umar et al (2014). The results showed that household size and land size were also influencing factors for the adoption of seed production. This depicts that farmers with larger farms and/or more plots gained more from seed production. Social support and quality inputs were other significant factors determining the profitability of seed production.

Constraints in seed production

The constraints faced by the seed growers are enumerated in Table 3. The observations show that high labour demand (Rank I) was biggest constraint followed by market uncertainty and procurement (Rank II), complexity of techniques (Rank III) and inadequate capital (Rank IV). However the pest and disease incidence was the least important constraint for them (Rank X). Umar

Table 3. Constraints in community seed production

Constraint	Respondents (%)	Rank
Coordination among farmers	64	VII
Deficiency in technical knowhow	68	VI
Inadequate input supply	48	VIII
Market uncertainty and procurement	72	V
Inadequate extension visit	22	IX
Inadequate capital	80	IV
Complexity of techniques	82	III
High labour demand	94	I
Pest and disease incidence	18	X
Market uncertainty and procurement	88	II

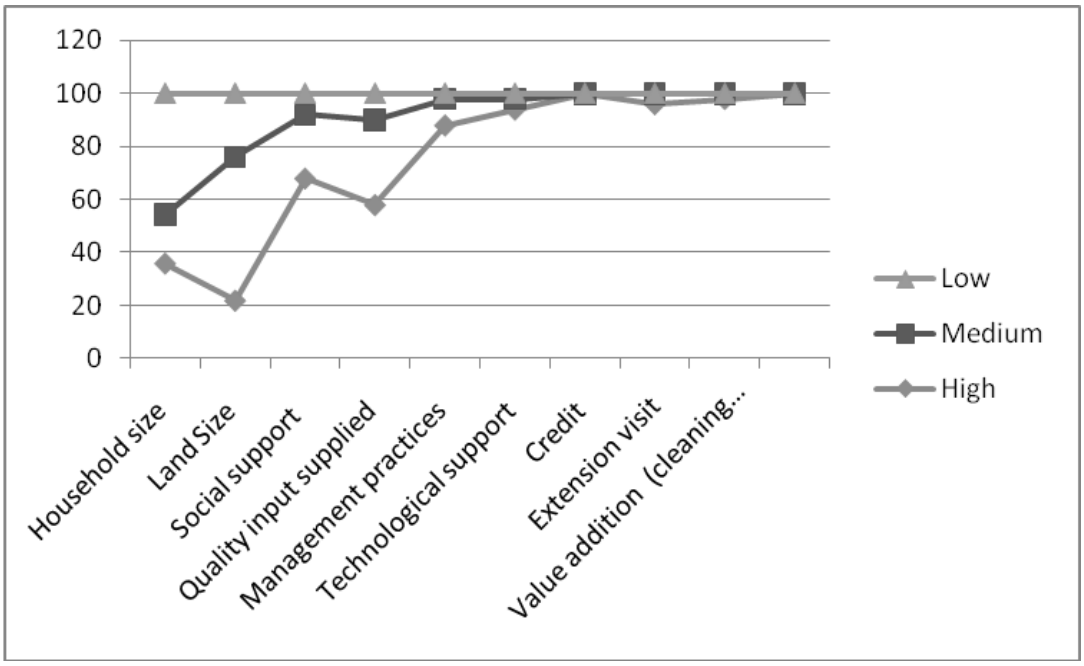

Fig 1. Factors influencing profitability of seed production enterprises

et al (2014) reported that labour demand, market uncertainty, lack of availability of machineries, deficiency in technical knowhow were the major constrains in seed production.

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