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Marketing Pattern and Price Spread of Berseem (*Trifolium alexandrinum*) Seed in Punjab

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ABSTRACT

The study was conducted in Punjab state during the agricultural year 2018-19. It was found that about 39 per cent of total seed produced was sold at the village level followed by self-retainment (35.35%), sale in nearby market (22.41%) and distinct market (3.45%). The market channel-I (Seed producer - seed user, was the most efficient with marketing efficiency (ME) of 84.17 followed by channel-V i.e. Seed producer- Milkfed- seed user (13.28), channel-II i.e. Seed producer- seed dealer- seed user (7.75) and channel-III i.e. Seed producer- wholesaler- seed dealer- seed user (5.32). The seed producers were getting a substantial margin through contract farming with Milkfed (channel-V).. Concept of village-based fodder seed bank may be introduced through establishment of fodder seed villages/farmers, fodder seed producer organizations/groups with facilities for seed processing and storage. On marketing front, fluctuation of price emerged as the most important hindrance to the seed producers followed lack of market information, variability in production, etc., Generating awareness about new varieties, incentives and assured market can play an important role in creating demand and consequently seed production of berseem.

Key Words: Berseem, fodder, Marketing, Price, Producer, Seed,

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INTRODUCTION

Livestock sector plays a fundamental role in the economy by providing employment to about nine per cent of the population in India (Bhardwaj *et al,* 2020). Dairying plays a main role to enhance the income of the farmers which in turn depend on the adequate supply of quality fodder. For the rearing of improved breeds of livestock, the production of higher quality of fodder is essential. Green fodder, nutritionally balanced and palatable constitute basic ration for milch cattle and farm animals for higher milk production and work efficiency respectively, apart from reducing feed and over-head costs (Dahiya and Tomar, 2018). The livestock population had increased by 4.7 per cent *i.e.,* from 512 million to 536 million during 2012-19, but the grazing land is declining day by day due to many factors like industrialization, urbanization, migration, population pressure, expansion of cultivable area, etc. The result of these factors is severe decline in feed and fodder. Additionally, limited land holdings, inappropriate agronomic practices, lack of timely inputs and poor seed production methods at the farm level also contribute to the seed shortage problem (Anwar *et al*, 2012).

Berseem (*Trifolium Alexandrinum L.*) is a leguminous winter (*rabi*) season forage crop which besides having many forage quality traits like high crude protein (20%) digestibility 65%) and palatability, is also multi cut in nature providing high quantum green fodder for a long duration (Malviya, 2018). Because of high yielding nature, it is grown over the vast area and its seed has huge demand in the market (Khalil and Jan, 2000). The cost of feeding milch animals can be reduced by using berseem in

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place of mineral concentrate (Kumar *et al,* 2021; Akila and Lakshmi, 2020). An all-berseem ration is adequate for milch animals yielding up to 6-7 litres of milk daily (PAU, 2021). The timely availability of seed to the farmers helps in timely sowing and realization of its full potential as fodder. The prices of seed fluctuate drastically during harvesting and sowing. There is also an impact of seed quality on production potential. In developing countries, fodder production has many folds restricted by land dearth, the inadequacy of standard seed (Tufail *et al,*2019), and unawareness about fodder production technology and usage (Kamanzi and Mapiye, 2012). Non-availability of good quality seeds especially in case of the improved varieties is the major reason for slow adoption of improved forage production technologies (Chauhan *et al,* 2017; Legheri *et al*, 2018).

Punjab state is among the leading states producing berseem with wheat being the main competing *rabi* season crop. The state has about one-fourth of the total area of fodder crops and livestock contributes approximately forty percent (40%) to the annual income of small farmers. The current livestock population of the state is 81.2 lakh (62.4 lakh adult) with a fodder supply of 31.4 kg per animal per day which is far from satisfactory. Based on 40 kg green fodder per adult animal per day, approximately 911 lakh tonnes of fodder is required (PAU, 2021). In this backdrop, the present study was carried out to study the marketing aspects of Berseem seed for taking the advantage of higher demand in the market along with measures to promote berseem seed production in the state.

MATERIALS AND METHODS

The study was conducted in two districts of Punjab namely Ludhiana and Gurdaspur which were selected randomly. Further, 20 berseem seed producers from each selected district were chosen randomly. Thus, a total of 40 seed producers were selected for the study. The primary data were collected using a pre-tested schedule by personal interview method relating to berseem seed production and method of sale along with constraints faced in production and marketing.

To work out the price spread of berseem seed through different marketing channels, different market intermediaries were selected from the prevailing market channels in Punjab. Hence, a sample of 10 intermediaries was taken. Data related to the method of procurement of berseem seed and its distribution, various costs incurred by intermediaries during the marketing of berseem seed were collected. The marketing efficiency of each marketing channels was worked out.

Statistical analysis

Price spread: The economic efficiency of the marketing system can be measured in terms of price spread. Price spread in the case of seed can be defined as the difference between the price paid by the consumer farmers (seed user) and price received by the producers (seed producer). It involves marketing costs and margin of the different market intermediaries involved in the marketing channel. In the present study, price spread was worked out by using 'Mode' method. From both the selected districts, five market channels were selected randomly to work out the price spreads.

Marketing efficiency: In order to examine the marketing efficiency of each marketing channel, Acharya's modified method was used (Acharya and Agarwal, 2014) which is stated as:

RP = FP + MC + MM

Where;

MME = Modified marketing efficiency

RP = Retail price of berseem seed/ Seed user's purchase price/(Rs/q)

FP = Net price received by the berseem seed producer (Rs/q)

MC = Total marketing costs (Rs/q)

MM = Total marketing margin (Rs/q)

Table 1: Disposal pattern of berseem seed by berseem seed producers in Punjab, 2018-19

S. No.	Disposal pattern	Sold to whom	Quantity (q)	Share in total production (%)
1.	Sale in village	Fellow farmers, relatives	90	38.79
2.	Retained for self-use	-	82	35.35
3.	Sale in nearby market	Seed dealers, wholesalers, Milkfed	52	22.41
4.	Sale in distant market	Other states	8	3.45

RESULTS AND DISCUSSION

The results of the collected information from the selected berseem seed producers are presented as below:

Disposal pattern of berseem seed followed by the respondents

The analysis of data revealed that the out of the total seed produced by the sampled seed producers, about 39 per cent was sold directly to seed users within the village itself which points toward the huge demand existing for the seed (Table 1).

Further, about 35 per cent of seed was self-retained for use in the next season. It was observed that about 22 per cent seed produced was sold in nearby markets to seed dealers, wholesalers, Milkfed, etc. Some quantity of seed (3.45%) was also sold in the distant markets (other states). All this indicates towards heavy demand of the berseem seed as whole production is being sold in the same year.

Marketing channels of berseem seed

Marketing of a commodity is an important part of every production process. Marketing channels refer to a part through which a commodity move from the producer to ultimate consumer. It is desired that the movement of goods from producer to consumer should be at the minimum cost consistent with provision of services**.** An efficient marketing system is a prerequisite for sustaining the tempo of increased agricultural production.

In the study area, five main prevailing marketing channels of berseem seed were identified through which the commodity passes from producer to the end user (Table 2).

Channel-I (Seed producer - seed user) was observed to the most preferred channel as 46.15 per cent seed was being sold through this channel. This is the direct channel through which the produce is being sold to the seed user directly by the seed producer. In Channel-II, Channel-III and Channel-IV, the berseem seed is sold through private intermediaries and the quantity handled through these channels has been worked out to be 18.91, 15.52 and 11.72 per cent of total seed sold in the study area, respectively. It was also observed that institutional sources play least role in the supply of berseem seed as only about 8 per cent berseem seed was distributed through this channel. It may be mentioned here that the role of Department of Animal Husbandry, Punjab was found to be fading with time. The department had produced and distributed just 150 kg berseem seed during 2016-17 and 115 kg during 2017-18. Afterwards it stopped its production. The main reason behind this was the shortage of working staff as against 112 Fodder Development Officers vacancies, only nine were posted at the state level (Department of Animal Husbandry, Punjab). In a similar study, the penetration of seed from the formal system in developing countries such as Pakistan has been very weak, supplying less than 20 per cent of the seed used by farmers, with the remaining seed

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Table 2. Seed distribution through different marketing channels in Punjab, 2018-19.

Sr. No.	Particular	Channel	Quantity handled (%)
1.	Directly by seed producer to seed user	Channel-I: Seed producer (producer) - seed user (consumer)	46.15
2.	Through private seed dealers to seed user	Channel-II: Seed producer- seed dealer- seed user	18.91
		Channel III: Seed producer- wholesaler- seed dealer- seed user	15.52
		Channel IV: Wholesaler of distant market - seed dealer- seed user	11.72
3.	Through institutional sources* to seed user	Channel V: Seed producer- institutional sources- seed user	7.70

*Includes Milkfed, Punjab Agricultural University, State Department of Animal Husbandry and authorized dealers

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being sourced through the informal supply system (Bishaw and Gastel, 2008).

Price spread of berseem seed in different marketing channels

It is very pertinent to study the marketing costs, margins and hence, the price spread of different marketing channels to improve the market structure for the berseem seed. It is helpful to improve the marketing efficiency by taking into account the seed producer's share in the price paid by seed user (consumer's rupee) and explore the further improvements in the existing market structure.

Channel-I: Seed producer- seed user

As already mentioned, this channel (channel-I) involving sale of berseem seed directly to the seed user (fellow farmers, relatives, etc.) was the most prevalent channel in the study area and major part of total production was marketed through this channel only. It was observed that the seed producer sold the produce directly to the seed user at the price of Rs 22400 per quintal (Table 3).

Analysis of different cost components indicated that the total marketing costs incurred by the producer farmer was Rs 263 per quintal which included cleaning and grading (0.74%), labour (0.15%), cost of packing material (0.11%), weighing (0.01%) and imputed value of time spent (0.18%). It was also observed that the price of berseem seed was not pre fixed by the seed producer, it was determined on mutual conversation and trust basis. The net price received by the producer was Rs. 22137 per quintal and the per cent share of producer in consumer's rupee was 98.82 per cent. As the net price received by the producer was the highest in this channel, it was the most favoured channel by the producers to sell their produced seed.

Channel-II: Seed producer- seed dealer- seed user

Channel II came out to be the second most common channel for marketing of the berseem seed. In this channel, berseem seed reached from its producer to end seed user through seed dealers prevailing in the market. The net price received by the producer in this channel was Rs. 20518 (Table 4).

Marketing costs incurred by the producer on cleaning and grading, weighing, bagging and sewing, loading and unloading, transportation, and imputed value of time spent were worked out to be Rs 389 per quintal having 1.68 per cent share in the price paid by the seed user. The purchase price of

Table 3. Price spread of berseem seed in marketing Channel-I (Seed producer- seed user).

Sr. No.	Particular	Value (Rs/q)	Share in consumer's price (%)
1.	Producer's sale price/ seed user's purchase price	22400	100.00
2.	Marketing expenses borne by the producer	263	1.18
3.	Net price received by the producer	22137	98.82

Note: Marketing expenses include cleaning & grading, labour charges, cost of packing material, weighing and imputed value of time spent by the producer.

Table 4. Price spread of berseem seed in marketing Channel-II (Seed producer- seed dealer- seed user).

Sr. No.	Particular	Value (Rs/q)	Share in consumer's price (%)
I.	Producer's sale price/ dealer's purchase price	20907	90.24
II.	Marketing expenses borne by producer		
	i) Cleaning and grading	166	0.72
	ii) Weighing. bagging, sewing, loading/unloading and cost of driver	39	0.17
	iii) Cost of bags	40	0.17
	iv) Transportation	88	0.38
	v) Imputed value of time spent	56	0.24
	Sub-total (i to v)	389	1.68
III.	Net price received by the producer	20518	88.56
IV.	Marketing expenses borne by dealer		
1.	Purchase price of dealer	20907	90.24
2.	Loss due to undersize seed @12%	2509	10.83
3.	Gain due to sale undersize seed	2160	9.32
	i) Actual price of seed for dealer (1+2-3)	21256	91.75
	ii) Cleaning and grading charges	93	0.40
	iii) Packing cost	48	0.21
	iv) Sub-total (i to iii)	21397	92.36
	v) Interest on sub-total (iv) @9% for 3 months	481	2.08
	vi) Rent of shop/ godown	134	0.58
	vii) Storage losses @ 0.5%	104	0.45
	viii) Permanent labour charges	88	0.38
	ix) Electricity bill and license fee	19	0.08
	Total cost borne by the dealer	1316	5.68
V.	Marketing margin of dealer	944	4.07
VI.	Dealer's sale price/seed user's purchase price	23167	100.00

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Table 5. Price spread of berseem seed in marketing channel-III (Seed producer – wholesaler - seed dealer - seed user)

Sr. No	Particular	Cost (Rs/q)	Share in consumer's price (%)
A	Producer's sale price/ wholesaler's purchase price (raw seed @ Rs18000 per q)	20160	85.79
B	Marketing expenses borne by producer		
	1. Cleaning and grading	150	0.64
	2. Weighing, bagging and sewing, loading/unloading, transportation and imputed value of time spent	189	0.81
	3. Cost of packing material	40	0.17
	Sub-total (1 to 3)	379	1.61
C	Net price received by the producer	19781	84.17
D	Marketing expenses borne by wholesaler		
i)	Purchase price of wholesaler	20160	85.79
ii)	Loss due to undersize seed @12%	2419	10.29
iii)	Gain due to sale undersize seed	2040	8.68
	1. Actual purchase price of wholesaler (i+ii-iii)	20539	87.40
	2. Cleaning and grading charges	75	0.32
	3. Packing cost	45	0.19
	4. Sub-total of items 1 to 3	20659	87.91
	5. Interest on item No. 4	465	1.98
	6. Rent of shop/ godown	22	0.09
	7. Storage loss@0.5%	101	0.43
	8. Labour charges	15	0.06
	9. Electricity bill and license fee	5	0.02
	Total cost borne by wholesaler	1107	4.71
E	Margin of wholesaler	733	2.73
F	Wholesaler sales price/ Dealer purchase price	22000	93.62
G	Expenses borne by dealer		
	1. Interest on purchase price @9% for 3 months	495	2.11
	2. Transportation cost and imputed value of time spent	106	0.45
	3. Rent of shop/ godown	146	0.62
	4. Permanent labour charges	96	0.41
	5. Electricity bill and license fee	9	0.04
	Total cost borne by the dealer	852	3.62
H	Margin of Retailer	648	2.76
I	Retailer's sale Price/ seed user's purchase price	23500	100.00

Note: One quintal of pure berseem seed can be obtained from 112 kg of raw seed

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Table 6. Price spread of berseem seed in marketing channel-IV (Wholesaler of distant market seed dealer- seed user)

Sr. No.	Particular	Value (Rs/q)	Share in consumer's price (%)
A	Wholesaler sale price/ Dealer's purchase price	24667	92.50
B	Marketing expenses borne by dealer		
	1. Purchase price of dealer	24667	92.50
	2. Interest on item No. 1 (@ 9% for three months)	555	2.08
	3. Rent of shop/godown	130	0.49
	4. Labour charges and imputed value of time spent	117	0.44
	5. Electricity bill and license fee	16	0.06
	6. Transportation cost during buying	116	0.43
	Total cost (1 to 8)	934	3.50
C	Actual purchase price of dealer (A+B)	25601	96.01
D	Dealer's margin	1066	3.99
E	Dealer's sale price/seed user's purchase price	26667	100.00

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the dealer was Rs. 20907 per quintal. However, after considering losses due to undersized seed it worked out to be Rs. 21256 per quintal. Total marketing costs incurred by the dealer was Rs 1316 per quintal (5.68%) which included loss due to undersize seed, gain due to sale of undersize seed, cleaning and grading, packing, rent of shop, storage losses, cost of labour charges, electricity and license fee. The marketing margin of seed dealer was 4.07 per cent (Rs 943/q). The purchase price of seed user/ sale price of seed dealer was found to be Rs 23167 per quintal.

Channel III: Seed producer - wholesaler- seed dealer- seed user

In this channel, berseem seed producers sell the seed to the wholesalers from which private seed dealers purchase it and further sell to ultimate consumers (seed users). The producers received price of Rs 20160 per quintal from the wholesalers. The producers' share in consumers' rupee was 85.79 per cent (Table 5). The marketing expenses borne by the producer were Rs. 379 per quintal which included cleaning and grading, weighing, bagging and sewing, cost of packing material, loading/unloading, transportation, driver cost. The marketing expenses borne by wholesaler were to the tune of Rs. 1107 per quintal of berseem seed. The wholesaler sold the produce to the seed dealer at a price of Rs. 22000 per quintal. Hence the margin of the wholesaler turned out to be Rs. 733 per quintal. The seed dealer further sold the produce to the end consumer at a price of Rs. 23500 per quintal. The total marketing cost incurred by the seed dealer were worked out to be Rs. 852 (3.62% share in consumer's price). Hence the net margin of the seed dealer was Rs. 648 per quintal (2.76% in the consumer's rupee).

Channel IV: Distant market (Wholesaler of distant market - seed dealer- seed user)

In Punjab, the berseem seed is also purchased from distant markets of other states like Haryana and Delhi through dealers of the distant markets. It was observed that the local seed dealers purchased seed from the distant market dealer at an average price of Rs. 24667 per quintal which accounted for 92.50 per cent of the consumer's purchase price (Table 6).

The purchase price of these dealers was more as compared to other channels. These dealers purchased the seed in packed form, hence they themselves did

Table 7. Price spread of berseem seed in marketing channel channel-V (Seed producer- Milkfed- seed user).

Sr. No.	Particular	Value (Rs/q)	Share in consumer's price (%)
A	Producer's sale price/ Milkfed's purchase price (raw seed @ Rs. 22000/q)	24640	94.26
B	Marketing expenses borne by producer		
	1. Cleaning and grading	144	0.55
	2. Weighing, bagging and sewing, bags cost and imputed value of time spent	69	0.27
	3. Certification fees	163	0.62
	Total expenses (1 to 3)	376	1.44
C	Net price received by the producer	24264	92.82
D	Marketing expenses borne by Milkfed		
i)	Purchase price of Milkfed	24640	94.26
ii)	Loss due to undersize seed@12%	2957	11.31
iii)	Gain due to sale undersize seed	2520	9.64
	1. Actual purchase price of Milkfed (i+ii-iii)	25077	95.93
	2. Cleaning, grading and packing cost	114	0.43
	3. Sub-total of items 1 to 3	25191	96.37
	4. Interest on item No. 4 @9% for 3 months	567	2.17
	5. Loading/unloading, transportation and labour	132	0.50
	Total cost borne by Milkfed	1249	4.78
E	Marketing margin of Milkfed	206	0.79
F	Milkfed's sale price/seed user's purchase price	26140	100.00

not incur any packing cost. The marketing expenses borne by the dealer in this channel was Rs. 934 per quintal which included shop rent, labour charges, transportation cost, unloading, imputed value of time spent, etc. The dealer sold the produce to seed user at the price Rs. 26667 per quintal. Hence, net margin received by the dealer was Rs. 1066 per quintal which was 3.99 per cent of the price paid by consumer.

Channel V: Seed producer- Milkfed- seed user

As a result of progressive extension of dairying by Milkfed, the farmers were fully satisfied by the high yielding forages for increasing milk production at low cost in the study area. Considering the shortage and non-availability of fodder seed, Milkfed started its own fodder seed multiplication programme and during 2018-19, about 1350 quintals of quality berseem seed was produced by Milkfed through contract farming. It was observed that the respondents produced certified seed under the contract and sold to Milkfed at a price of Rs 24640 per quintal (Table 7).

The expenses borne by the seed producer for cleaning, grading, weighing, bagging, sewing, purchasing bags, etc. came out to be Rs. 376 per quintal. The net price received by the producer was Rs. 24264 per quintal. The produce reached to seed user through Milkfed co-operative agency. The purchase price of Milkfed was Rs. 24640 per quintal. The actual purchase price of Milkfed (after taking

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Table 8. Marketing efficiency of berseem seed under different marketing channels. (Rs/q)

Sr. No.	Particular	Channel-I	Channel-II	Channel-III	Channel-V
1.	Net price received by the producer	22137	20518	19781	24264
2.	Consumer's purchase price	22400	23167	23500	26140
3.	Total marketing costs	263	1705	2338	1625
4.	Total marketing margins	-	944	1381	206
5.	Modified marketing efficiency	84.17	7.75	5.32	13.28

into account the loss borne due to about 12 kg/q undersized seed) was Rs. 25077. Total marketing expenses borne by the Milkfed was Rs. 1249, which involved various costs like cleaning, grading, packing, loading, unloading, transportation, labour, etc. Sale price of Milkfed/purchase price of seed user was Rs. 26140 per quintal. Marketing margin of Milkfed was only Rs. 206 (0.7% of farmers' purchase price). The seed producers were getting a substantial margin from this trade which may help in bringing forward the Milkfed as a main public institute for supply of quality seed in the Punjab state.

Marketing efficiency

Analysis of data revealed that due to certain constraints, berseem seed growers were selling their produce through channel-II and channel-III in spite of sizeable losses. Hence, taking into account the significance of the aforesaid facts, the marketing efficiency (ME) of various channels prevailing for the berseem seed marketing were also studied. It was observed that the most efficient marketing channel was channel-I with marketing efficiency of 84.17. Next most efficient marketing channel emerged out to channel-V with ME of 13.28 followed by channel-II (7.75) and channel-III (5.32) as shown in Table 8.

It was evident that with rise in the number of market intermediaries, the ME of a system declines and vice-versa. The number of market intermediaries was the same in channel-II and channel-V, but difference in marketing efficiency was due to marketing margin. The marketing margin of channel-V was less because it is handled by co-operative institution that supplies seed under the public scheme and follow the policy of no profit no loss.

Problems faced by the seed producers

The major problems faced by the sampled seed producers during production and marketing of the seed were also studied. It was observed that fluctuations in price of seed emerged as the major problem faced by the respondents (83.33%) as given in the Table 9. In a similar study at IGFRI Jhansi, the price of Berseem seed varied highly in the market form Rs 80 per kilogram to Rs 160 per kilogram (Kumar *et al.*, 2017).

Further, lack of market information and instability in production were reported by 66.67 per cent each of the seed producers. The seed requires optimum temperature and humidity for its storage. Half of the respondents faced constraint of improper storage facility. Also, there was absence of proper marketing system for the marketing of berseem seeds and about one-fourth farmers had to sell their produce at village level and only few farmers were able to explore the distant markets with better prices. Delay in payment, high transportation costs and non-remunerative price of produce were reported by about 17 per cent producers each.

CONCLUSION

Out of five prevalent marketing channels for marketing of berseem seed, Channel-I involving direct sale from producer to consumer emerged as most preferred channel with seed distribution share of about 46 per cent produce and marketing efficiency (ME) of 84.17. Another marketing channels

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Table 9. Problems faced by the berseem seed producers in Punjab, 2018-19. (Multiple responses)

Sr. No.	Problem	No. of seed producers	Per cent to total
1.	Price fluctuations	10	83.33
2.	Lack of market information	8	66.67
3.	Instability in production	8	66.67
4.	Improper storage facilities	6	50.00
5.	Long distance market access	3	25.00
6.	Delay in payments	2	16.67
7.	High transportation costs	2	16.67
8.	Non-remunerative price according to variety	2	16.67

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involving intermediaries had much lower ME i.e., channel-V (13.28), II (7.75) and III (5.32). The seed producers were getting a substantial margin in berseem seed produced by Milkfed through contract farming (channel-V) which may help in bringing forward the Milkfed as a main public institute for supply of quality seed in the Punjab state in the future also. As practically seed production chain in forage crops is lacking, therefore, seed chain linking milk federations, state line departments, and other community-based organizations may be initiated for popularization and production of forage crops for enhanced demands. Concept of village-based fodder seed bank may be introduced through establishment of fodder seed villages/ farmers, fodder seed producer organizations/groups with facilities for seed processing and storage. On marketing front, fluctuation of price emerged as the most important hindrance to the seed producers as reported by 83.33 per cent respondents followed other problems like lack of market information, variability in production, lack of storage facility, long distance market access, delayed payments, high transportation costs and non-remunerative price. Generating awareness among the farmers/ livestock keepers/policy makers about new varieties, incentives and assured market for encouraging seed production can also play an important role in creating demand, usage of quality fodder and consequently seed production of berseem.

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