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STATUS OF CERTIFIED SEED PRODUCTION OF FORAGE CROPS IN HARYANA

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SUMMARY

Last five years data (2016-17 to 2020-21) on certified seed of forage crops was collected from Haryana State Seed Certification Agency (HSSCA), Panchkula (Haryana) including certified seed production in public, private and co-operative sector. The data of fresh as well as revalidated certified seed were also collected to know the status of certified seed in the state. The results revealed that quantity of certified seed of forage crops has increased since last five years. Certified seed of oat crop has increased from 838.58 q (2016-17) to 2960.79 q (2020-21). Number of seeds lots offered for certification have also increased from 10 to 22. During 2017-18, only one seed lot and during 2018-19, three seed lots were offered for revalidation of 15.00 q seed while no seed was offered for revalidation since last two years *i.e.* 2019-20 and 2020-21. In oat crop, five varieties *i.e.* HJ-8, OS-6, OS-377, OL-10, Kent are in seed chain and three varieties *i.e.* HB-2, BL-10, BL-42 of berseem are in seed chain since last five years. Berseem certified seed production has also increased from 17.37 q (2016-17) to 120.00 q (2020-21) but production was maximum (161.40 q) during 2018-19. No quantity of berseem certified seed was offered for revalidation since last five years which indicates the heavy demand of seeds of fodder crops. Apart from this quantity of certified seed, a huge quantity of TL seed is also being sold to the farmers which need to be estimated for total quantity of seed available for farmers. The above information may be useful for seed producing organizations for demand forecasting/planning and can be used in framing agricultural policies.

Key words : *Avena sativa*, forage crops, certified seed, revalidation, *Trifolium alexandrinum*

India is home to largest livestock population having world's 56.7% of buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry (Anonymous, 2013). Presently, the country is facing a shortage of 11.2% green fodder, 23.4% dry fodder (Roy *et al.,* 2019). The shortage of fodder creates dairy sector less economical and unattractive as a source of income among the poor farmers of the country. As a consequence, fodder crops occupy only 4% of the total cultivable area in the country. The choice for increasing area under fodder cultivation is very limited. Hence, there is an urgent need to increase fodder production which is possible through availability of quality seed of fodder crops. There is a wide gap between requirement and availability of forage seeds in the country. Fodder production in India is varies considerably across the country and its use mainly depends on cropping pattern, soils, climate and socio-economic condition and cattle type. Forage seed production also has another problem as the economic part is not the seed as forage crops are shy seeder and harvested before seed setting to feed animals. Moreover, non-synchronous flowering/anthesis and spikelet maturity, abscission of spikelet after maturity and presence of large number of sterile glumes in range grasses also affect seed harvest. Oat and berseem are main *rabi* fodder crops of Haryana. Berseem (*Trifolium alexandrinum L.*) is a *rabi* season leguminous fodder crop and also called king of the fodders. It is one of the most suitable fodder crops with irrigation facilities which remains soft, nutritive, palatable and succulent at all stages of growth. It is a highly liked fodder by the animals having crude protein 20-24%, calcium 3%, phosphorus 0.4%, and digestible dry matter 65-70 percent. Oat (*Avena sativa* L.) also known as *jai*, is a most important cereal fodder crop of winter season. The green plant is good forage and makes good hay and silage. Seed replacement rate in forage crops is still very low due to non-availability of certified seeds in time, more price and some technological gaps. Seed demand of cultivated forages, range grasses and

legumes is increasing day by day. Seed is just not a carrier of life but an entity that may bring social changes as well. Seed being one of the most vital agricultural inputs, exercises a tremendous influence on the forage production. Healthy and viable seed is the first pre-requisite for increasing seed production and to reduce possible seed crop failures. Quality seed is the vital input for realizing potential productivity by ensuring better germination, rapid emergence and vigorous growth thereby good crop stand alone contributes about 15-20 % to the crop productivity (Sidhawani, 1991). Timely availability of quality seeds of high yielding varieties is still a major concern. Concerted and coordinated efforts are imperative in ensuring timely availability of seeds as well as increasing the seed replacement rate. Certain norms are followed for the production of pure seeds and seeds are multiplied through a well defined seed chain *viz*. nucleus, breeder, foundation and certified/truthful labeled seed. Certified and truthfully labeled seed are distributed to farmers for crop production. State seed certification agency certifies the seed which is valid upto nine months. If seed standards are maintained above Indian Minimum Seed Certification Standards (Anonymous, 2013), the validity can be extended by seed certification agency upto next six months. The seed possess maximum vigour at the time of physiological maturity, thereafter it start decreasing with the passage of time. Hence, it is advisable to farmers instead of revalidated seed, fresh seed should

TABLE 1
Assessment of prevalence of revalidated seed lots of oat (*Avena sativa*) in Haryana

Names of varieties/Lot nos.	HJ-8, OS-6, OS-377, OL-10, Kent			
Year 2020-21	No. of lots	No. of Varieties	Percent of Var.	Percent of lots
Total Numbers of lots offered for certification (Initial)	22	3	100	100
Total Numbers of lots accepted for certification (Initial)	20	3	100	90
Total Quantity of lots accepted for certification (Initial)	2960.79	3	100	90
Total Numbers of lots offered for revalidation (RV-I)	1	1	33	4.5
Total Numbers of lots accepted for revalidation (RV-I)	1	1	33	4.5
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2019-20				
Total Numbers of lots offered for certification (Initial)	19	4	100	100
Total Numbers of lots accepted for certification (Initial)	13	4	100	68
Total Quantity of lots accepted for certification (Initial)	900.35	4	100	68
Total Numbers of lots offered for revalidation (RV-I)	1	1	25	5
Total Numbers of lots accepted for revalidation (RV-I)	1	1	25	5
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2018-19				
Total Numbers of lots offered for certification (Initial)	12	4	100	100
Total Numbers of lots accepted for certification (Initial)	9	4	100	75
Total Quantity of lots accepted for certification (Initial)	1658.30	4	100	75
Total Numbers of lots offered for revalidation (RV-I)	3	1	25	25
Total Numbers of lots accepted for revalidation (RV-I)	3	1	25	25
Total Quantity of lots accepted for revalidation (RV-I)	15.00	1	25	25
Year 2017-18				
Total Numbers of lots offered for certification (Initial)	31	3	100	100
Total Numbers of lots accepted for certification (Initial)	27	3	100	87
Total Quantity of lots accepted for certification (Initial)	1020.00	3	100	87
Total Numbers of lots offered for revalidation (RV-I)	1	1	33	0.03
Total Numbers of lots accepted for revalidation (RV-I)	1	1	33	0.03
Total Quantity of lots accepted for revalidation (RV-I)	15.00	1	33	0.03
Year 2016-17				
Total Numbers of lots offered for certification (Initial)	10	3	100	100
Total Numbers of lots accepted for certification (Initial)	9	3	100	100
Total Quantity of lots accepted for certification (Initial)	838.58	3	100	90
Total Numbers of lots offered for revalidation (RV-I)	1	1	33	10
Total Numbers of lots accepted for revalidation (RV-I)	0	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-

be used. The study was conducted to know the status of certified seed production in Haryana.

MATERIALS AND METHODS

The data of certified seed production of forage crops (oat and berseem) for last five years was collected from Haryana State Seed Certification Agency (HSSCA), Panchkula (Haryana) to know the status of certified seed production of cereal crops in Haryana. The data includes the certified seed production from all the seed production organizations of Haryana including public, private and co-operative sector. The data of fresh as well as revalidated certified seed were collected from four regional offices of HSSCA *i.e.* Karnal, Hisar, Sirsa and Rohtak and compiled. Data on total quantity, number of varieties, number of seed lots offered for fresh certification and revalidation were also collected.

RESULTS AND DISCUSSION

Collected data shows that quantity of certified seed of oat crop has increased from 838.58q (2016-17) to 2960.79 q (2020-21) in last five years. Number of seeds lots offered for certification have also increased from 10 to 22. During 2017-18, only 1 seed lot, during 2018-19, three seed lots were offered for revalidation of 15.00 q seed and no seed was offered for revalidation since last two years *i.e.* 2019-20 and

TABLE 2
Assessment of prevalence of revalidated seed lots of Berseem (*Trifolium alexandrinum*) in Haryana

Names of varieties/Lot nos.	HB-2, BL-10, BL-42			
Year 2020-21	No. of lots	No. of Varieties	Percent of Var.	Percent of lots
Total Numbers of lots offered for certification (Initial)	6	2	100	100
Total Numbers of lots accepted for certification (Initial)	6	2	100	100
Total Quantity of lots accepted for certification (Initial)	120.50	2	100	100
Total Numbers of lots offered for revalidation (RV-I)	-	-	-	-
Total Numbers of lots accepted for revalidation (RV-I)	-	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2019-20				
Total Numbers of lots offered for certification (Initial)	6	2	100	100
Total Numbers of lots accepted for certification (Initial)	6	2	100	100
Total Quantity of lots accepted for certification (Initial)	40.80	2	100	100
Total Numbers of lots offered for revalidation (RV-I)	-	-	-	-
Total Numbers of lots accepted for revalidation (RV-I)	-	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2018-19				
Total Numbers of lots offered for certification (Initial)	5	1	100	100
Total Numbers of lots accepted for certification (Initial)	1	1	100	20
Total Quantity of lots accepted for certification (Initial)	161.40	1	100	20
Total Numbers of lots offered for revalidation (RV-I)	-	-	-	-
Total Numbers of lots accepted for revalidation (RV-I)	-	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2017-18				
Total Numbers of lots offered for certification (Initial)	7	2	100	100
Total Numbers of lots accepted for certification (Initial)	7	2	100	100
Total Quantity of lots accepted for certification (Initial)	113.40	2	100	100
Total Numbers of lots offered for revalidation (RV-I)	2	1	50	29
Total Numbers of lots accepted for revalidation (RV-I)	0	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-
Year 2016-17				
Total Numbers of lots offered for certification (Initial)	8	3	100	100
Total Numbers of lots accepted for certification (Initial)	7	3	100	100
Total Quantity of lots accepted for certification (Initial)	17.37	3	100	87
Total Numbers of lots offered for revalidation (RV-I)	-	-	-	-
Total Numbers of lots accepted for revalidation (RV-I)	-	-	-	-
Total Quantity of lots accepted for revalidation (RV-I)	-	-	-	-

2020-21 (Table 1). Berseem seed production has also increased from 17.37 q (2016-17) to 120 q (2020-21) but production was maximum (161.40q) during 2018-19. No quantity of berseem certified seed was offered for revalidation since last five years which indicates the heavy demand of seeds of this crop (Table 2). In oat crop, five varieties *i.e.* HJ-8, OS-6, OS-377, OL-10, Kent are in seed chain and three varieties *i.e.* HB-2, BL-10, BL-42 of berseem are in seed chain since last five years. Old varieties such as HFO 114 (Oat) and Mascavi (Berseem) have been replaced by new high yielding varieties indicating enhancement in varietal replacement rate. Varietal replacement rate is an essential factor to have genetic gains for crop productivity. Rapid breeding cycles and quality seed systems are essential to enhance VRR (Singh *et al.,* 2020). The quantity of seed offered for certification during 2018-19, was reduced in both the crops. Unfavourable weather conditions during this period may be possible reason for this reduction in total quantity of certified seed of these crops. In India, seed certification is voluntary and only notified varieties are eligible for certification. There is a provision of another class of seed *i.e.* truthfully labeled seed (TL seed). Truthfully labeled seed of both notified and un-notified can be produced. The record of certified seed is available with state seed certification agencies but it is difficult to estimate the total quantity of TL seed produced. Hence, there is need to estimate the total quantity of seed produced by the seed producing organizations. The discouragement of farmers'/ uncertified seeds is motivated by the facts that: (a) their continue use leads to decrease infertility (b) usually infected with insects and diseases (c) having less physical purity and more weeds, broken seeds and empty shells (Gaines *et al.,* 2007 and Jorgensen *et al.,* 2007). The above information will be useful for the seed producing organizations in demand forecasting and future planning of seed production. The information will also be important for constitution of polices related to agriculture.

CONCLUSION

It is concluded from the study that the quantity of certified seed of fodder crops (oat and berseem) has increased in the state during last five years which indicates the enhancement in seed replacement rate. Replacement of old varieties by the new varieties in seed chain indicates varietal replacement rate in the state. No seed lot was offered for revalidation of seed which shows huge demand of certified seed of fodder crops.

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