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RESEARCH PAPER

Impact of foliar spray of nutrients and seed treatment on protein uptake and protein yield of lathyrus (*Lathyrus sativus* L.) under relay cropping system

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Abstract : An experiment was carried out during the *Rabi* season of 2016, to study the impact of foliar spray of nutrients and seed treatment on protein uptake and protein yield of lathyrus (*Lathyrus sativus* L.) Under relay cropping system at the Agronomy Research Farm of IGKV, Raipur.The experiment was laid out in Factorial Randomized Block Design with twelve treatments replicated thrice. highest cost of cultivation, gross return, net return and B:C ratio was found in treatment F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray (11570.50, 29492.64, 18618.14, 1.712 Rs.ha^{-1}, respectively), where as in case of seed treatment S_2: seed treatment with Sodium molybdate @ 0.5 g kg^{-1} seed gave the maximum cost of cultivation, gross return, net return and B:C ratio (11308.17, 26475.39, 15583.39, 1.431 Rs.ha^{-1}, respectively).

Key Words : Lathyrus, Utera, Foliar spray, Seed treatment, Energetics

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INTRODUCTION

The world population is projected to ~8.9 billion by 2050. Various pulses play an important role to satisfy the growing human food demands and nutritional security. Pulses are cheaper than meat; they are often referred to as "poor man's meat" in developing countries like India. Pulses are grown as a sole crop, intercrop, catch crop, relay crop, cover crop and green manure crop etc. Under sequential/mono-cropping in different agro-ecological regions. The per capita consumption of pulses in India is decreasing from 69 g in the year 1960-61 to 40 g in 1997-98 as against 80 g recommended by WHO and FAO. This has also had a direct effect on per capita availability of pulses (39.4 g/capita/day from the earlier 36g/capita/day). The current per capita availability of pulses is below 40 g which is half of the minimum per capita requirement of 80 g as recommended by the WHO. This requires a paradigm shift in research, technology generation and dissemination and commercialization along with capacity building in frontier areas of research. Grass pea is suitable for relay cropping with paddy rice and it has potential among grain legumes for its tolerance to dry conditions and its adaptability to unfavorable environments. Its seeds are highly nutritious having protein

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(31.9%), carbohydrates (53.9%), oil (0.9%) and ash (3.2%). It makes a good complimentary protein diet when mixed with cereals. Recently, some low- toxin lines have been developed that may prove safe for both animal and human foods. In India during 2012-13, lathyrus is cultivated in 0.58 mill. ha. of land and production is 0.43 mill. tonnes with the productivity of 742 kg and in 2014 India it is cultivated in 495.3 thousand hectare with the production of 456.0 thousand tonnes and average productivity was 921 kg/ha in India (Anonymous. 2014). In Chhattisgarh during 2010 – 2011 it was cultivated on 349.3 thousand ha of land and production is 212.4 thousand tonnes with the productivity of 608 kg (IIPR). In Chhattisgarh during 2016 it was cultivated in 358.22 thousand hectare with the productivity of 660 kg ha^{-1} (Anonymous, 2016). Lathyrus (*Lathyrus sativus* L.) is mostly grown on the residual soil moisture in rice-fallows as *utera* (relay) crop (Gupta and Bhowmick, 2005). But low productivity especially under *utera* system is the major problem associated with this crop (Bhowmick *et al*., 2014).

MATERIAL AND METHODS

The investigation was carried out during *Rabi* season of 2016 at Instructional cum Research Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India, situated at 21o4' N, ~ 1684 ~ 81o35' E, respectively and 290.20 meters above mean sea level. In experimental field the stubbles of rice after harvesting is left of 30 cm. height. The soil of the experimental field was *Vertisols* with low, medium and high in N, P and K, respectively and neutral in reaction. The climate of the region is sub-humid to semi-arid. The experiment was laid out in Factorial Randomized Block Design having the combination of twelve treatments and three replications. The treatment consisted of six foliar nutrients spray and two seed treatments. The experiment was comprised of factor A. Foliar nutrients, F_1: Control (No foliar nutrients spray), F_2: 2% *Neem* coated urea spray at branching, F_3: 2% *Neem* coated urea spray at branching and 15 days after 1st spray, F_4: 0.5% NPK (19:19:19) spray at branching, F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray, F_6: 2 % DAP spray at branching and 15 days after 1st spray and next factor B. Seed treatments, S_1: Control (No seed treatment) and S_2: Seed treatment with sodium molybdate @ 0.5 g kg^{-1} seed Lathyrus (*Lathyrus sativus* L.) variety Prateek was used in the experiment and sowing was done on 17th October, 2017 as *paira* crop by broadcasting in standing rice field 15 days before harvesting of rice with a seed rate of 75 kg ha^{-1}. The crop was harvested on 7th February 2016. Nitrogen content in the seeds of lathyrus was estimated by Kjeldhal's method (Jackson, 1967). The protein per cent in the seed was calculated by multiplying the nitrogen content by a factor of 6.25. Protein yield per hectare was worked out on the basis of seed protein content and seed yield of lathyrus.The data obtained in respect of protein were statistically analyzed by analysis of variance method (Gomez and Gomez, 1984) .

RESULTS AND DISCUSSION

The effect of foliar spray and seed treatment on economis and energetics of lathyrus under relay cropping system are summarized under following heads :

Protein content (%) in lathyrus:

The data on protein content are presented in Table 1. Significantly maximum protein content (27.08%) was recorded with the F_5: 0.5% NPK (19:19:19) spray at

Table 1: Protein content and protein yield in lathyrus as influenced by different foliar nutrients spray and seed treatments

Treatments	Protein content (%)	Protein yield (kg h^{-1})
Foliar nutrients spray		
F_1: Control (No foliar nutrients spray)	23.36	216.56
F_2: 2% *Neem* coated urea spray at branching	25.14	250.91
F_3: 2% *Neem* coated urea spray at branching and 15 days after 1st spray	27.04	318.35
F_4: 0.5% NPK (19:19:19) spray at branching	24.23	280.97
F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray	27.08	360.78
F_6: 2 % DAP spray at branching and 15 days after 1st spray	26.08	313.74
S.E.±	0.80	13.29
C.D. (P = 0.05)	2.35	38.97
Seed treatments		
S_1: Control (No seed treatment)	24.79	265.73
S_2: Seed treatment with Sodium molybdate @ 0.5 g kg^{-1} seed	26.19	314.71
S.E.±	0.46	7.67
C.D. (P = 0.05)	1.36	22.50

branching and 15 days after 1st spray as compared to other foliar nutrient sprays. However, it was comparable with F_6: 2 % DAP spray at branching and 15 days after 1st spray, F_3: 2% *Neem* coated urea spray at branching and 15 days after 1st spray and F_2: 2% *Neem* coated urea spray at branching. In case of protein content among seed treatment, S_2: Seed treatment with sodium molybdate @ 0.5 g kg^{-1} seed recorded significantly higher content of protein (26.19%) over S_1: Control (No seed treatment).

The differences in protein content of lathyrus due to interaction of foliar nutrients sprays and seed treatment were found non-significant.

Protein yield:

The data on protein yield are presented in Table 1. Significantly maximum protein yield (360.78 kg h^{-1}) was recorded with the F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray as compared to other foliar nutrient sprays. In case of seed treatment, S_2: Seed treatment with sodium molybdate @ 0.5 g kg^{-1} seed recorded significantly higher protein yield (314.71 kg h^{-1}) over S_1: Control (No seed treatment). The differences in protein content of lathyrus due to interaction of foliar nutrients sprays and seed treatment were found non- significant.

Conclusion:

The results in present has revealed that significantly maximum protein content was recorded with the F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray. However, it was comparable with F_6: 2 % DAP spray at branching and 15 days after 1st spray, F_3: 2% *Neem* coated urea spray at branching and 15 days after 1st spray and F_2: 2% *Neem* coated urea spray at branching. In case of protein content among seed treatment, S_2: Seed treatment with sodium molybdate @ 0.5 g kg^{-1} seed recorded significantly higher content of protein. Significantly maximum protein yield was recorded with the F_5: 0.5% NPK (19:19:19) spray at branching and 15 days after 1st spray as compared to other foliar nutrient sprays. In case of seed treatment, S_2: Seed treatment with sodium molybdate @ 0.5 g kg^{-1} seed recorded significantly higher protein yield.

REFERENCES

Anonymous (2014). *Area, production and yield of lathyrus and mothbean in India*. Pulses data book state wise.2,2.4. Indian Institute of pulse research, Kanpur (U.P.) India.

Anonymous (2016). Krishi Darshika, IGKVV, Raipur (C.G.): 5pp.

Bhowmick, M.K., Dhara, M.C., Duary, B., Biswas, P.K. and Bhattacharyya, P. (2014). Improvement of lathyrus productivity through seed priming and foliar nutrition under rice-utera system. *J. Crop & Weed,* **10** (2) : 277-280.

Gomez, K.A. and Gomez, A.A. (1984). *Statistical procedure for Agricultural Research*. John Wiley and Sons Publication. pp. 84.

Gupta, S. and Bhowmick, M.K. (2005). Scope of growing lathyrus and lentil in relay cropping systems after rice in West Bengal, India. *Lathyrus Lathyrism Newsletter*, **4** : 28 – 33.

Jackson, M.L. (1967). *Soil and plant analysis*. Bombay, New Delhi, Asia Publishing House, pp.30-38.