

Problems and Prospects of Grass Pea (*Lathyrus sativus* L.) Production in Bihar

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Abstract

Grass pea (*Lathyrus sativus*) is considered as one of the important climate resilient crops throughout the world. Bihar is one of the pioneer state in *lathyrus* production. A meta-analysis was conducted to know the problems and prospects of Grass pea (*Lathyrus Sativus*) production in Bihar. The major problems identified in production of *lathyrus* are people phobia on its consumption, unavailability of good quality seeds possessing low neurotoxin content and standardized *lathyrus* production technology etc. The major prospect of *lathyrus* production in Bihar is availability of 2.2 million rice fallow areas. These rice fallow areas have high potentiality for *lathyrus* cultivation as *utera/paira* crop. Government of India had lifted ban on cultivation of *lathyrus* and more production of *lathyrus* will reduce our dependence on import of other pulses.

Keywords: Phobia, Climate resilient, Livelihood, Leafy vegetable, Prospects

Grass pea (*Lathyrus sativus*) is well known crop and it is grown as both food and fodder crop. It is rich in nutritive value with 53.9% carbohydrate and 31.9% protein content. Its environmental stress tolerance capability is unique as it has the ability to withstand drought as well as water logging condition. It grows best in 10-25 °C temperature and 400-650 mm/year rainfall. Climate is changing naturally at its own pace and *lathyrus* is found to emerge as a viable crop option for this climate change scenario (Kumar *et al.* 2013). It is considered as one of the important climate resilient crops throughout the world.

Bihar is one of the pioneer state in *lathyrus* production with 13.62% of area and production with 20.09% yield among the all *lathyrus* producing state. *Lathyrus* intake is common in Bihar because less fuels are used for its cooking, its cost is low and it matches the taste of the community (Mishra *et al.*

2013). However, due to high neurotoxin (β -oxalyl-L- α,β -diaminopropionic acid (ODAP, also known as β -N-oxalyl-amino-L-alanine, or BOAA) content, its cultivation was once banned, but from 2016, this ban has been lifted. A meta-analysis was conducted to know the problems and prospects of Grass pea (*Lathyrus Sativus*) production in Bihar. *Lathyrus* is considered as life saver as well as destroyer. It has several advantages, at the same time there are number of disadvantages which it possesses. The neurotoxin, β -N-oxalyl-L-a, β -diaminopropionoc acid (BOAA) is present in entire part of *lathyrus* whose excessive consumption cause a neurological disorder which creates phobia among people and there is unavailability of good quality seeds of *lathyrus* possessing low BOAA content too. As the standardized *lathyrus* production technology is not yet introduced to the farmers, they rely on the

traditional technology and varieties. But the low productivity of traditional varieties of *Lathyrus* is major constraint. Though it is known as hardy crop with high environmental stress tolerant ability, still biotic stresses like powdery mildew, rust, affects the crop yield badly. Untimely sowing due to changing pattern of climate (monsoon) alters the crop physiology. It is mainly grown in relay cropping without investing much energy and resources which ultimately has negative impact on its production quality as well as quantity. High weed infestation in relay cropping on residual soil moisture leads to crop-weed competition at initial phase of crop growth. It is not grown commercially and as sole crop. There is also very less support from public extension system in *Lathyrus* cultivation.

Bihar being the pioneer state in *Lathyrus* cultivation it has a number of prospects. There is availability of 2.2 million rice fallow areas. These rice fallow areas have high potentiality for *Lathyrus* cultivation as *uteral/paira* crop. *Lathyrus* is a leguminous crop, it fixes nitrogen in soil and there be help in sustaining the soil fertility. Its nitrogen fixation capacity helps to produce higher yields for the crop itself as well as the succeeding crops. This crop is generally used to aid main economic crop in many production areas due to its leguminous nature. There is a chance to introduce *Lathyrus* as a pulse in food habit of people. Dried grains of grass pea are grinded or milled to use it as Dal in Nepal and an evidence of using grass pea flour to adulterate the higher- priced legume flours i.e chickpea and mung-bean is also noticed (Campbell, 1997). Government of India had lifted ban on cultivation of *Lathyrus* and more production of *lathyrus* will reduce our dependence on import of other pulses. Adulteration of *Lathyrus* with other pulses will be reduced. In Bihar a large number of resource poor women harvest green leaves of grass pea as leafy vegetable and sell it to market and it creates livelihood opportunities to large number of farm women.

MATERIALS AND METHODS

The study has been conducted after going through the relevant literature available on grass pea (*Lathyrus sativus*). The systematic review of scholarly work of different scientists are also considered in order to complete the research.

RESULTS AND DISCUSSION

(a) Problems of *Lathyrus* production

Lathyrus cultivation has a number of disadvantages. There is a neurotoxin namely β -N-oxalyl-L-a, β -diaminopropionoc acid (BOAA) is present in entire part of *Lathyrus* whose excessive consumption cause a neurological disorder called lathyrism which creates phobia among people. Seeds possessing low BOAA content are unavailable and its traditional varieties give low productivity. Farmers have not yet provided with the standardized *Lathyrus* production technology. Public extension system also does not show much concern of *lathyrus* cultivation.

Table 1: Problems of *Lathyrus* production faced by farmers

Sl. No.	Problems	Ranks
1	People phobia of <i>lathyrus</i> consumption due to BOAA presence.	I
2	Unavailability of good quality <i>lathyrus</i> seeds possessing low BOAA content.	II
3	Low productivity of traditional varieties of <i>lathyrus</i> .	III
4	Biotic stresses like powdery mildew, rust, affects the crop yield inspite of having high environmental stress tolerant ability.	IV
5	Farmers are unaware of standardized <i>lathyrus</i> production technology	V
6	High weed infestation in relay cropping on residual soil moisture leads to crop-weed competition at initial phase of crop growth.	VI
7	Growing in relay cropping without investing much energy and resources reduce production quality as well as quantity.	VII
8	Less support from public extension system in <i>lathyrus</i> cultivation.	VIII

Prospects of *Lathyrus* cultivation

Lathyrus is also considered as life saver. It has leguminous nature which makes it capable of fixing nitrogen in soil which leads to increase in yield of the crop itself as well as the succeeding crops. Bihar ranks 2nd position in area and production both among the all *lathyrus* producing state. 2.2 million rice fallow areas are available in Bihar. Grass pea has nitrogen fixation capacity which makes it enable to yield higher yields for itself as well as succeeding crops. As less fuels are used for *lathyrus* cooking, poor people prefer it for their food habit.

The leaves of *lathyrus* is also sold as leafy vegetables by the resource poor women to create livelihood opportunity for them.

Table 2: Prospects

Sl. No.	Prospects	Ranks
1	Nitrogen fixation capacity produce higher yields for the crop itself and succeeding crops too.	I
2	There are 2.2 million rice fallow area in Bihar	II
3	Having leguminous nature, it is used to aid main economic crop in many production areas.	III
4	More production of <i>lathyrus</i> will reduce dependence on import of other pulses	IV
5	Selling of grass pea leaves as leafy vegetables create livelihood opportunities for poor women.	V
6	It is one of the important climate resilient crops throughout the world.	VI
7	<i>Lathyrus</i> intake is common in Bihar because less fuels are used for its cooking	VII
8	Adulteration of grass pea with other pulses will be reduced	VIII

Lathyrus cultivation scenario in Bihar

Lathyrus intake is common in Bihar. Bihar ranks 2nd position in area and production both among the all *lathyrus* producing state. It is considered as one among major pulse crops grown in Bihar.

Table 3: Productivity of major pulses grown in Bihar (kgs)

Year	Chick pea	Pigeon-pea	Lentil	Mung bean	Lathyrus	Peas
1970-71	713	896	643	351	581	—
1975-76	550	705	582	336	612	606
1980-81	718	971	641	466	619	534
1985-86	839	1142	772	485	787	665
1990-91	941	1243	892	556	790	747
1995-96	651	929	581	557	657	554
2000-01	1033	1348	981	581	915	965
2005-06	902	1291	705	556	853	892
2010-11	1182	1515	900	669	998	1051
2013-14	1147	1667	1147	680	—	1041

The table 4 depicts the *lathyrus* cultivation scenario in Bihar. The area as well as production for *lathyrus* cultivation keeps on decreasing from 1970- 2018. The yield shows some variation.

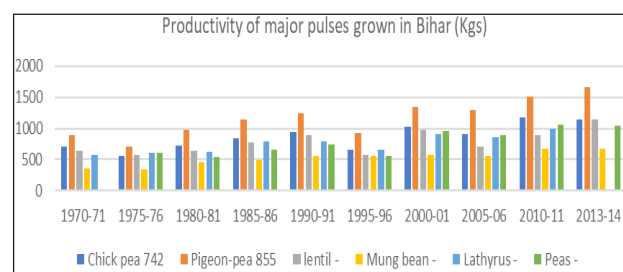


Fig. 1: Productivity of major pulses grown in Bihar

Table 4: Area, Production and yield of Grass pea (*Lathyrus sativus*) in Bihar

Year	Area ('000ha)	Production ('000t)	Yield (Kgs/ha)
2011-12	73.8	NA	998
2012-13	71.199	83.397	1388
2013-14	63.233	70.548	1116
2014-15	60.661	60.055	990
2015-16	54.606	50.987	934
2016-17	52.102	55.176	1059
2017-18	53.001	53.001	1000

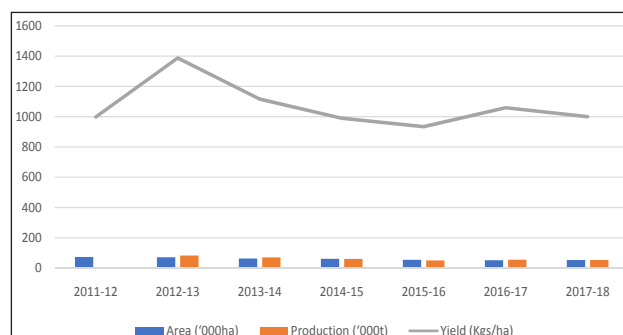


Fig. 2: Area, Production and yield of Grass pea (*Lathyrus sativus*) in Bihar

CONCLUSION

In Bihar there is a greater scope of grass pea (*lathyrus*) cultivation. Due to its cheaper value resource poor people include it in their food habit. It also creates livelihood opportunity. It is considered as major pulse crops. Due to the presence of a neurotoxin, its popularity goes down. There is a need to provide less BOAA content *lathyrus* seed to the farmers, to make them aware of benefits of *lathyrus* cultivation and to also make them aware of standardized production technology to grow *lathyrus* in a very efficient way.

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