



## Grasspea: A Potential Fodder and Feed Resources

Ashutosh Sarker

*International Center for Agricultural Research in the Dry Areas, India*

Pooja Sah

*International Center for Agricultural Research in the Dry Areas, India*

Vijay Kumar Yadav

*Indian Grassland and Fodder Research Institute, India*

M. M. Das

*Indian Grassland and Fodder Research Institute, India*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/23/3-3-1/7>

The XXIII International Grassland Congress (Sustainable use of Grassland Resources for Forage Production, Biodiversity and Environmental Protection) took place in New Delhi, India from November 20 through November 24, 2015.

Proceedings Editors: M. M. Roy, D. R. Malaviya, V. K. Yadav, Tejveer Singh, R. P. Sah, D. Vijay, and A. Radhakrishna

Published by Range Management Society of India

---

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## **Grasspea: A potential fodder and feed resources**

Ashutosh Sarker\*<sup>1</sup>, Pooja Sah<sup>1</sup>, V. K. Yadav<sup>2</sup>, M. M. Das<sup>2</sup>

<sup>1</sup>International Center for Agricultural Research in the Dry Areas (ICARDA) New Delhi, India

<sup>2</sup>ICAR-Indian Grassland & Fodder Research Institute, Jhansi, India

\*Corresponding author e-mail: [A.SARKER@cgiar.org](mailto:A.SARKER@cgiar.org)

**Keywords:** Feeding trial, Fodder, Grasspea, Low ODAP

### **Introduction**

Grasspea (*Lathyrus sativus* L.) is an important legume crop grown in India, Bangladesh, China, Ethiopia, Nepal, and Pakistan for human food, animal feed and soil health improvement. In India, grasspea is grown in about 521,100 ha, mainly in Chhattisgarh, Bihar, Jharkhand, Maharashtra, Orissa, Assam, West Bengal, and eastern Uttar Pradesh. Grasspea cultivation is low-cost and easy. Inherently grasspea possesses resistance to drought, excess moisture, salinity, diseases, and insect pests. As grasspea has an ambivalent reputation due to ODAP content in its plant parts, efforts are on to develop low or ODAP-free grasspea varieties with high biomass for dual purpose for human food and animal feed. A number of such varieties are now available in India, Bangladesh, Nepal and Ethiopia. Grasspea is known as excellent feed and fodder crop for centuries as a main concentrate for horses (Anonymous, 1894). Livestock is a key component of farming systems in South Asia and in Africa, and most particularly with small and marginal farmers, estimated about 678 million, and indicates importance of livestock to their livelihoods (ILRI, 2000).

### **Materials and Methods**

In India, low ODAP and high biomass grasspea varieties along with recommended production packages are being up-scaled among farmers of Assam, Bihar, Chhattisgarh, Uttar Pradesh and West Bengal. In these states, demonstrations were conducted with low ODAP and high biomass varieties, Nirmal, Prateek, Mahatoera and Ratan with the active participation of 6769 farmers from 17 districts of 517 villages covering an area of 2350 ha. Farmers grew grasspea mainly as relay crop. Nutritional analysis of grasspea fodder is done at Indian Grassland & Fodder Research Institute, Jhansi. Samples were collected at 50% flowering stage and analysed for various chemical components. Feeding trials were also conducted on small ruminants to know the effect of feeding of grasspea fodder and grain-based concentrates.

### **Results and Discussion**

The demonstrations have been conducted at farmers' fields and it was observed that improved varieties performed well as compare to local cultivars. On an average, improved varieties with site-specific production technologies provided 49% higher seed yield than local cultivar and farmers' practice. Field performance on biomass showed excellent fodder and seed production with the variety Nirmal with slightly higher biomass yield at 50 % flowering compared to the variety Ratan, and ranged from 250 to 278 q/ha. The variety Ratan was found to be better seed yielder than Nirmal. However, large scale demonstration over locations indicated that both the varieties are equally suitable for dual purpose use (grain and fodder). For fodder analysis, samples were collected at 50% flowering showed crude protein content between 14.80 to 16.48 % which was at par with superior legume fodder, viz. Egyptian clover and Stylosanthes, etc. While most important parameter to decide the usability as fodder was ODAP content, was below detectable limits (<3.5 ppm), indicating suitability and safety of grasspea to be used as fodder.

**Nutrient utilization and growth performance of Jalauni lambs with grasspea grain supplemented diet:** The effect of supplementation of grasspea seed in the diet of lambs was studied for a period of 90 days. In control group (T<sub>1</sub>) the animals were fed *ad lib* green chaff of M P Chari with concentrate mixture as per requirement whereas in the T<sub>2</sub> and T<sub>3</sub> the crude protein of Groundnut cake was replaced @ 50% and 100% with lathyrus seed protein in the concentrate mixture. DM intake as percentage of body weight was comparable among the groups and ranged from 3.31% to 3.39%. Digestibility coefficients of DM, OM and CP was 63.30, 65.54 and 63.04% in T<sub>1</sub>, 64.57, 66.82 and 66.79% in T<sub>2</sub> and 62.40, 64.86 and 63.26% in T<sub>3</sub>, respectively. NDF digestibility was also similar among the groups (49.81 vs 48.36 vs 49.01%). DCP intake (g/d) was 52.40, 53.13 and 55.43, respectively whereas TDN intake (g/d) was 393, 366 and 425 among the respective groups. DCP content of the diet ranged from 8.44 in T<sub>1</sub> to 9.22% in T<sub>2</sub> and TDN content varied from 63.12% in T<sub>1</sub> to 61.08% in T<sub>3</sub>.

**Table 1:** Average seed yield gain of grasspea in West Bengal and Chhattisgarh under NFSM-Pulses project (2011-13)

| State        | District    | Variety   | Average yield of improved variety (kg/ha) | Average yield of Local (kg/ha) | % increase over local |
|--------------|-------------|-----------|---|--------------------------------|-----------------------|
| West Bengal  | Cooch Behar | Nirmal    | 1100                                      | 670                            | 63.4                  |
|              | Nadia       | Ratan     | 1077                                      | 860                            | 25.2                  |
|              |             | Nirmal    | 1049                                      | 860                            | 22.0                  |
|              | Murshidabad | Ratan     | 1907                                      | 1285                           | 48.3                  |
|              |             | Nirmal    | 1786                                      | 1285                           | 39.0                  |
| Chhattisgarh | Durg        | Prateek   | 998                                       | 578                            | 72.61                 |
|              |             | Mahateora | 984                                       | 590                            | 66.72                 |
|              | Bilaspur    | Prateek   | 925                                       | 596                            | 54.99                 |
|              |             | Mahateora | 917                                       | 585                            | 56.57                 |
|              | Raipur      | Prateek   | 899                                       | 598                            | 50.17                 |
|              |             | Mahateora | 992                                       | 571                            | 73.46                 |
| Average      |             |           | 1148                                      | 770                            | 49                    |

**Table 2:** Fodder and seed yield in farmers' field demonstrations

|        | Jhansi (U.P.) |            |             | Lalitpur (U.P.) |            |             | Datia (M.P.) |            |             | Tikamgarh (M.P.) |            |             |
|--------|---------------|------------|-------------|-----------------|------------|-------------|--------------|------------|-------------|------------------|------------|-------------|
|        | GFY (q/ha)    | DMY (q/ha) | Seed (q/ha) | GFY (q/ha)      | DMY (q/ha) | Seed (q/ha) | GFY (q/ha)   | DMY (q/ha) | Seed (q/ha) | GFY (q/ha)       | DMY (q/ha) | Seed (q/ha) |
| Min    | 130           | 18.9       | 9.5         | 140             | 39.5       | 9.2         | 145          | 19.5       | 11.5        | 150              | 40.5       | 10.2        |
| Max    | 390           | 98.5       | 20.5        | 360             | 95.3       | 18.3        | 350          | 99.5       | 21.5        | 285              | 100.5      | 17.3        |
| Avg    | 240           | 65.2       | 14.3        | 265             | 62.5       | 14.4        | 255          | 66.2       | 13.5        | 210              | 66.2       | 13.9        |
| Nirmal | 250           | 60.2       | 15.2        | 278             | 61.2       | 15.4        | 260          | 62.5       | 14.5        | 255              | 61.2       | 14.0        |
| Ratan  | 230           | 58.5       | 14.2        | 245             | 59.2       | 16.2        | 245          | 68.5       | 16.4        | 245              | 58.1       | 15.2        |

**Table 3:** Chemical composition of low ODAP varieties of grasspea

| Parameter | DM%   | N.D.F.% | A.D.F.% | Cellulose % | Lignin% | Ash%  | OM%   | CP%   | ODAP (ppm) |
|-----------|-------|---------|---------|-------------|---------|-------|-------|-------|------------|
| Min       | 14.73 | 33.29   | 26.11   | 21.20       | 5.16    | 7.94  | 89.58 | 14.80 | -          |
| Max       | 18.86 | 46.15   | 36.61   | 29.19       | 8.09    | 10.42 | 92.07 | 16.48 | -          |
| Mean      | 17.03 | 41.04   | 31.73   | 24.88       | 6.59    | 9.14  | 90.90 | 15.65 | -          |
| SD        | 1.91  | 3.75    | 3.10    | 2.58        | 0.95    | 0.73  | 0.78  | 0.54  | -          |
| Ratan     | 17.50 | 39.91   | 30.04   | 23.31       | 6.49    | 8.94  | 90.75 | 15.97 | <3.5*      |
| Nirmal    | 16.57 | 42.17   | 33.42   | 26.45       | 6.71    | 9.34  | 91.79 | 15.32 | <3.5*      |

### Conclusion

Grasspea is increasingly recognized as an important feed and fodder crop by the resource poor farmers of semi-arid and dry areas. Acceptability of low ODAP varieties by the farmers of non-traditional grasspea growing areas and high nutritional composition makes the grasspea a perfect dual purpose for crop securing food, feed and fodder security in the region.

### References

- Anonymous, 1894. *Lathyrus Fodder* (*Lathyrus sativus*, L.) *Bulletin of miscellaneous information* (Royal botanic gardens, Kew) 94: 349-352
- ILRI, 2000. *Strategy to 2010: making the livestock revolution work for the poor*. International Livestock Research Institute, Nairobi, Kenya