A guava-based hortipasture system for mitigating climate change and sustaining fodder & fruit supply in semi-arid regions of India

* Kamini Gautam, Sunil Kumar, Amit Kumar Singh, Avijit Ghosh, Manjanagouda SS and R V Kumar
ICAR-Indian Grassland and Fodder Research Institute, Jhansi-284003, Uttar Pradesh, India
* For correspondence: kaminigautam1989@gmail.com; Kamini@icar.gov.in

INTRODUCTION

• Semi-arid regions in India are facing challenges of poverty, malnutrition, low livestock productivity and climate change.
• 90% people in the region depend on livestock for their livelihood.
• For tackling aforesaid issues a Hortipasture was established with Guava (Psidium guajava L.) a nutritious fruit tree; fodder grass Cenchrus ciliaris (Buffel grass) and fodder legume Stylosanthes hamata (Caribbean stylo) under rainfed conditions of semi-arid region in central India.

MATERIALS AND METHODS

10 YEARS OLD HORTI-PASTURE

Guava Cultivar
Shweta
Lalit
Buffel grass
Caribbean stylo

Location: 25° 26’ 08” N, 78° 30’ 21” E; altitude: 216 m amsl; ICAR-Indian Grassland and Fodder Research Institute, Jhansi, India

Spacing: Guava cultivars: 6 m x 6 m ; Cenchrus ciliaris: planted between tree rows (100 cm × 50 cm row- to- row & plant to plant); Stylosanthes hamata: @ 4 kg/ha was sown as a line between 2 rows of grass.

Pruning treatment: T1: pruning 15 cm top portion of one/more year-old shoot; T2: 30 cm top portion of one/more year-old shoot; T3: 45 cm top portion of one/more year-old shoot and T4: No pruning.

Data recording: Pasture yield; fruit yield and carbon stock

Statistical Design: RBD

RESULTS AND DISCUSSION

<table>
<thead>
<tr>
<th>Variety Treatments</th>
<th>Fruit Yield (t/ha)</th>
<th>Pasture Yield (t DM/ha)</th>
<th>Carbon stock TREE Mg C ha⁻¹</th>
<th>Carbon stock PASTURE Mg C ha⁻¹</th>
<th>Total carbon stock SYSTEM Mg C ha⁻¹</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Lalit</td>
<td>Shweta</td>
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<td>Shweta</td>
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<tr>
<td>T1</td>
<td>12.96</td>
<td>11.80</td>
<td>5.4</td>
<td>5.6</td>
<td>7.88</td>
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<tr>
<td>T2</td>
<td>15.46</td>
<td>14.87</td>
<td>5.7</td>
<td>5.4</td>
<td>9.95</td>
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<tr>
<td>T3</td>
<td>14.54</td>
<td>10.88</td>
<td>6.1</td>
<td>5.8</td>
<td>8.20</td>
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<tr>
<td>T4</td>
<td>9.58</td>
<td>9.94</td>
<td>5.3</td>
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<tr>
<td>Mean</td>
<td>13.1</td>
<td>11.87</td>
<td>5.6</td>
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Abbreviations: CD: Critical Difference; SEM = Standard Error of Mean; DM = Dry Matter; NS =Non significant, V: Variety; T: Treatment

• T2 treatment should be followed to maintain high yield and quality of guava fruits even after 10 year age
• System is self sufficient to produce quality fodder (grass + legume) rich in crude protein
• System is capable of storing huge amount of carbon in biomass.

CONCLUSION

HORTI-PASTURE

Nutritional security
Fodder security
Economic security
Environmental security

ACKNOWLEDGEMENTS

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