CENTRE AT A GLANCE

ALL INDIA COORDINATED RESEARCH PROJECT FOR DRYLAND AGRICULTURE
Biswanath Chariali Centre

Domain Map  (Districts :- Dhemaji, Lakhimpur, Sonitpur, Darrang and Udalguri)

ARUNACHAL PRADESH

BHUTAN

NORTH BANK PLAIN ZONE OF ASSAM

BN COLLEGE OF AGRICULTURE
ASSAM AGRICULTURAL UNIVERSITY
BISWANATH CHARIALI-784176
Location of the Centre
Latitude : 26°84' N
Longitude : 93°13' E
Altitude : 86.7 m

Tehsil/Block: Kochgaon
District: Sonitpur, State: Assam
Agro climatic Zone (NARP): North Bank Plain Zone (NBPZ)
Domain Districts: Darrang, Sonitpur, Lakhimpur, Dhemaji, Udalguri
Agro ecological sub region (NBSSLUP): Hot Humid Alluvial Plain

Background:
The Jorhat Centre of All India Coordinated Research Project for Dryland Agriculture was in operation since 10.01.2005 and the Centre was shifted to B. N. College of Agriculture, Biswanath Chariali on 12th February 2010. The location of centre is in B.N College of Agriculture, Assam Agricultural University, Biswanath Chariali, Sonitpur, Assam-784 176

Mandate of AICRPDA Centre
☐ To optimize the use of natural resources.
☐ To identify suitable crops and cropping systems for rainfed situations.
☐ To evaluate crop varieties for drought prone situations.
☐ To develop alternate and sustainable land use system.
☐ To evaluate and transfer improved agro technology to farmers' fields.
☐ To improve livelihood of the rainfed farmers.

Information on Experimental Farm of AICRPDA, BNCA
Total area of AICRPDA Experimental farm, BNCA, Biswanath Chariali is 10 hectares. Depending upon the land situation a number of crops like rice, maize, potato, greengram, blackgram, toria, groundnut, buckwheat, niger, lentil, rajmah, arahar, ginger, turmeric etc are generally grown in the farm.

Climate
The climate of Biswanath Chariali is characterized by hot and humid summer and dry and cool winter. The station is receiving average annual rainfall of 1968 mm (1971-2014) while during post-monsoon (October-November) and winter (December-February) period the average rainfall is only 146 and 59 mm respectively. The rainy season starts in March and quantum of rainfall as well as number of rainy days increases gradually and reaches maximum in the month of July and then decline to minimum during December. Monthly morning relative humidity of the station always remains above 80% whereas monthly evening relative humidity varies from 47% to 73% throughout the year. The monthly average maximum temperatures varies from 23.5°C to 32.3°C.
### Soil Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>12 - 77%</td>
</tr>
<tr>
<td>Silt</td>
<td>12-55%</td>
</tr>
<tr>
<td>Clay</td>
<td>21-40%</td>
</tr>
<tr>
<td>Textural class</td>
<td>Sandy Loam - Sandy Clay Loam</td>
</tr>
<tr>
<td>pH</td>
<td>4.13 - 5.67</td>
</tr>
<tr>
<td>Organic Carbon</td>
<td>0.35 - 0.57 %</td>
</tr>
<tr>
<td>Available Nitrogen</td>
<td>188.00-473.09 kg ha⁻¹</td>
</tr>
<tr>
<td>Available Phosphorus</td>
<td>15.00-27.03 kg ha⁻¹</td>
</tr>
<tr>
<td>Available Potassium</td>
<td>178.50-523.89 kg ha⁻¹</td>
</tr>
<tr>
<td>Exch Na</td>
<td>0.40-1.00 Meq/100gm</td>
</tr>
<tr>
<td>Exch K</td>
<td>0.50-2.30 Meq/100gm</td>
</tr>
<tr>
<td>Exch Mg</td>
<td>0.30-1.20 Meq/100gm</td>
</tr>
<tr>
<td>Exch Ca</td>
<td>0.70-2.40 Meq/100gm</td>
</tr>
<tr>
<td>CEC</td>
<td>4.60-11.00 Meq/100gm</td>
</tr>
<tr>
<td>Exch Acidity</td>
<td>0.70-1.80 Meq/100gm</td>
</tr>
</tbody>
</table>

### CURRENT RESEARCH PROGRAMMES:

**Theme: Rainwater management**
- Studies on effectiveness of different lining materials on rain water storage in farm pond
- Enhancing crop productivity through harvested rainwater in rainfed condition
- Evaluation of polymers for high water productivity in high value vegetable crops (tomato- late cauliflower- okra) under upland conditions of North Bank Plains Zone of Assam

**Theme: Integrated Nutrient management**
- Permanent manurial trial for rice-green gram -toria system Maize-Greengram-Rajmah System under rainfed situation in NBPZ
- Effect of foliar application on drought tolerance and nutrient use efficiency in toria.
- Integrated nutrient management in Rice based cropping system under rainfed condition.

**Theme : Resource Characterization:-**
- Survey and soil site suitability evaluation of the soils of AICRPDA Biswanath Chariali of Sonitpur district and NICRA Village Chamua of North Lakhimpur Districts of Assam.

**Theme: Cropping Systems:-**
- Comparative study on Maize-based double cropping systems under north bank plain zone of Assam
- Effect of Fertility levels on yield and economics of sesame based intercropping system
- Effect of planting time on local small tuber potato varieties to improved varieties under rainfed condition of Assam.
- Relay cropping of rabi pulses with kharif rice under rainfed medium low land situation of NBPZ Assam.
Development of crop-coefficients for crop growth simulation models in Sali rice and potato grown in mid land situation of north bank plain zone of Assam.

Theme: Evaluation of Improved Varieties
- Participatory breeding programme for medium duration high yielding rice varieties under rainfed eco-system of NBPZ of Assam.
- Evaluation of pigeon pea genotypes for rainfed upland situation of Assam
- Evaluation of sesame genotypes for rainfed upland situations of Assam
- Evaluation of early mustard genotypes under rice-rabi crop sequence of Assam
- Assessment of performance of new and under utilised crop species adapted for dryland agriculture
- Collection, evaluation and maintenance of Ahu rice germplasm
- Evaluation of rice varieties under organic management

Theme: Energy Management
- Effect of tillage and INM on soil moisture conservation and yield of groundnut in NBPZ of Assam.

Theme: Natural Resource Management
- Assessment of Arsenic and Iron content of ground water of North Bank Plain Zone of Assam and possible remedial measures of Arsenic and Iron contaminated groundwater for agricultural use. (Collaborative mode with Tezpur University)

Brief Research Highlights:

Rainwater management:
- Polythene sheet lining was found to be the best lining material over the other lining materials viz. Cow dung + Soil Plaster and Cement + Soil Plaster. Seepage and percolation loss was highest in no lining condition followed by Cow dung + Soil Plaster, Cement + Soil Plaster and Polythene sheet lining material.
- With a rainwater harvest potential of 2.45 ha cm cement lined tank 2.07 ha cm harvested rainwater can be irrigated potato land of 0.99 ha, 0.31 ha and 0.21 ha by one, two and three times irrigation at 25; 25 & 60; and 25, 60 & 80 days after planting, respectively. Irrigation had a marked effect on tuber yield. The irrigation frequency increased yield significantly, and the highest yield was recorded at three irrigations at 25, 60 & 80 days after planting (IR3) with organics. Application of harvested rainwater at 25, 60 and 80 days after planting with organics may be suitable for obtaining high yield in potato. A harvest potential of 2.45 ha cm cement lined tank maximum 0.21 ha potato land can be irrigated by applying 99.9 mm irrigation at 25, 60 & 80 days after planting without application of vermicompost @ 2 t ha⁻¹ may be economically suitable for obtaining higher tuber yield of potato under prevailing situations.

Nutrient management:
- The maximum grain yield and straw was registered by the application of 75% RDF with 5 t ha⁻¹ vermicompost in rice. The same treatment also recorded highest rain water use efficiency (RWUE). This was followed by the application of 75% RDF + 3 t ha⁻¹
vermicompost. In *Greengram*, highest grain yield and stalk yield were recorded in treatment 75% RDF + 3 t ha⁻¹ vermicompost which results were at par with 75% RDF with 5 t ha⁻¹ vermicompost. In Toria also maximum grain and straw yield were in 75% RDF + 5 t ha⁻¹ vermicompost. Highest B:C ratio was recorded under treatment 75% RDF with 5 t ha⁻¹ vermicompost followed by 75% RDF with 3 t ha⁻¹ vermicompost. Highest Rice Equivalent Yield (REY) was observed under 75% RDF with 5 t ha⁻¹ vermicompost.

- Foliar application of KCl at different concentrations showed highest seed yield and straw yield for the treatment RDF + 2% KCl spray before flowering and at silique formation stage followed by the treatment RDF +2% KCl spray before flowering and at silique formation.

**Resource characterization:**
- 14 soil mapping units have been identified taking in to account the important properties that influence the crop productivity. Crops suitable for the 14 mapping units have been identified.

**Energy management:**
- The maximum grain yield of 28.63 q ha⁻¹ was observed under the treatment T₂ (Two harrowing + one pulverization by power tiller) followed by 21.89 q ha⁻¹ under the treatment T₄ (minimum tillage followed by rotavator). Lowest yield of 10.05 qha⁻¹ was recorded under the treatment T₃ (Rotavator). Maximum 96 numbers of pods per plant was recorded under the treatment T₂ (Two harrowing + one pulverization by power tiller). Highest Energy Use Efficiency of 2.5 % was observed under the treatment T₁ (minimum tillage) and lowest of 0.5 % was observed under the treatment T₃ (conventional tillage).

**Cropping system:**
- Sesame intercropped with greengram (2:2) with fertility level of 30:20:20 found to be the best in terms of SEY followed by Sesame intercropped with black gram (1:1) at same fertility level.
- Maize was grown during *kharif* with the variety Monsanto hybrid *Prabal* and grain yield was found to vary between 65.4 -71.5 q ha⁻¹. Highest maize equivalent yield was observed for *Maize-Potato* cropping sequence followed maize – *rajmah*.
- Early planting of potato recorded higher tuber yield than that of late planting situation. Among the varieties under study, the recommended check variety (*Kufri Pokhraj*) yielded maximum tuber yield with highest B:C ratio.
- The highest tuber yield, B:C ration and maximum rice equivalent yield of potato was obtained with rice -potato cropping sequence as compared to others followed by rice-rajmah and rice – Buckwheat

**Evaluation of improved varieties:**
- An effort for developing a package for cultivation of early maturing pigeonpea has been initiated. As an initiative varietal evaluation programme has been undertaken on pigeonpea under AICRPDA, BNCA. The genotype BAC 1 (Biswanath Arahar
Collection 1) exhibited highest seed yields followed by BAC 2, which are higher than the recommended variety T21. Both the varieties were of long maturity duration. Among the early maturing varieties ICPL 88039 exhibited lower but comparable grain yield. The observations indicate that ICPL 88039 is a promising early maturing pigeon pea genotype for the region which matured in 150 days under normal sown condition.

- Based on previous trials of rice varietal evaluation under rainfed upland direct seeded condition, Dehangi was found to be the best over the years followed by Pahari Dusura, a variety from Karbi Anglong. Two newly included varieties Safalu and Sahabhagi performed better than the Pahari Dusura. The variety Dehangi may be recommended as direct seeded Ahu variety to replace Banglami and Rongadora in the NBPZ and is under OFT.

- A medium duration rice variety, TTB 404 performed the best followed by Komal, Satyaranjan and Chandrama. The duration of Chandrama being only 125 days, it may be of added advantage. The observations indicated that there is possibility of identifying better varieties than the existing recommended and cultivated varieties in the medium duration group even with lesser maturity duration.

- A bulk population of niger viz. NB-1 has been developed which exhibited higher seed yield than the recommended variety NG 1 which is under Multi Locational Tria
Award/ Honour /Recognition to the faculties for the year 2014-15:

(i) "Best AICRPDA Centre Award 2014" for outstanding contribution in Dryland Research during the XXIV Biennial Workshop of AICRPDA held at RVSKW, Indore on 27th December, 2014.

(ii) Best Dryland Farmer Award, 2014 for outstanding contribution in adoption and popularization of crop diversification in rainfed uplands for higher productivity and profitability under NICRA held during the XXIV Biennial Workshop of AICRPDA held at RVSKW, Indore on 27th December, 2014.

Best AICRPDA Centre Award received by the Chief Scientist, AICRPDA, BNCA

Best Dryland Farmer Award received by Mr. H. Neog, NICRA village, Chamua, Lakhimpur district
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<tr>
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*Please note: This is a partial list of the officers.*