

Theme : Human health sustainability under changed climate

Groundnut-a climatic resilient and sustainable crop for *Jhoom* to ensure nutritional food security of north-eastern states of India

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Groundnut, packed with energy, minerals and vitamin and an important food legume crop of tropical and subtropical areas, is utilized throughout India in one or the other form and helps alleviate malnutrition. But its availability, due to its scanty cultivation, is very poor in remote areas of north eastern region of India where production of groundnut has to be increased, to ensure nutritional food security in this region. The large scale cultivation of groundnut in the north-eastern states where water is not a limiting and soils are rich in organic matter providing good soil physical condition for pod growth is of utmost important. However, climatic variations, the acidic nature (4.5 to 6.0 pH) of soil and Al- and Fe-toxicities and Ca- and P-deficiencies are the major factors which may restrict the expansion of groundnut cultivation in these region (Singh et al 2003, 2006). Through an inter-institutional collaborative project between DGR, Junagadh and ICAR Research Complex NEH Region in Meghalaya, Tripura, Manipur, Mizorum, Nagaland and Arunachal Pradesh, a number of field studies on climatic resilient varieties and integrated nutrient managements conducted for almost of two decades (1996-2013) with an aim to restore the *Jhoom* land to maintain the biodiversity and provide nutritional food security through groundnut in these states.

About 1000 germplasm lines and more than 100 cultivars were screened under various yield trials and several Ca and P –efficient and Al-toxicity tolerant genotypes were identified. The varieties ICGS 76, ICGV 86590, TKG 19A, DRG 12, OG 52-1, ICGS 44, TG 37A, GG 7, SG 99, GIRNAR-2, R 9251, SG 84, DH8, CSMG 84-1, GG 20, GG 16, CSMG-9510 were recommended for their commercial cultivation in NE states. Also large seeded groundnut varieties BAU 13, B-95, M 13, M 335, M 197, JSP 19 may be cultivated under high management for table purpose. Most of these cultivars are rich in Iron and zinc which will help in alleviating these micronutrient malnutrition. The optimum sowing time of groundnut for different situations in NE states are: 5th May - 15th June during Kharif, and 15th Sept to 15th Oct during Rabi (winter) season (only under polythene/straw mulch). Treat the seed with Thiram @ 3 g k⁻¹g seed or Bavistin @ 2 g kg⁻¹ seed before sowing.

Application of 40 kg N (all basal), 50 kg P and 50 kg K (both 50 % as basal and 50 % at 50 days after sowing (DAS) and 500 kg ha⁻¹ lime or gypsum at 50 DAS boost the crop

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yield. Biofertilizers inoculation with efficient nitrogen fixing *Bradyrhizobium* strains (IGR 40 and TAL 1000), new phosphorus solubilizing microbe (PSM) and PGPR 1 and 2 developed by DGR are essential for effective use of fertilizers. There is need of multiplication and distribution of these biofertilizers to the farmers. In highly eroded acidic soils of discarded *Jhooms*, deficient in Ca, and P, furrow application of lime @ 0.5-1.0 t ha⁻¹ + P fertilizer is must. The decomposed FYM or organic matter at 5-10 t ha⁻¹ before sowing ameliorate Al-toxicity and hence all possible local manurial resources should be used for the improvement of acid soils. The basic slag, lime sludge and, press mud are cheaper source of liming materials and wherever available may be used as an alternate source.

Weed infestation, due to high rainfall, is a major problem of these states where application of 1 kg ha⁻¹ pendimethalin or butachlor at the time of sowing followed by one hand weeding at 40-50 DAS is keep the crop weed free. If further weed occurs, foliar application of quizalofop (0.1%) or imazethapyr (0.2 %) at 50-70 days after sowing (DAS), take care of the major weeds. The intercropping and crop rotation such as: Groundnut-Mustard, Groundnut- Potato, Maize + Groundnut(2:2) - Mustard, Upland rice + Groundnut (4:2) – Mustard, and Groundnut + Pigeon pea (4:2) increase the production without replacement of traditional crops. Use of polythene or straw mulch is must, in Rabi-summer crop facing low temperature, which increases temperature enhancing germination and growth during early growth stages. This technology needs large-scale implementation in NE states.

Various state seed corporations and NSC should take-up the seed production of the recommended varieties and distribute the same to the growers/farmers in the region. The seed produced during rainy season can cater the requirement of rainy and post-rainy seasons of these states. Seed village programme is necessary to increase the availability of quality seeds in each state with the help of state agriculture department and NE council. There is a need to develop small scale industries for groundnut processing and value addition in the NE States.

Suggested Readings:

Singh, A.L., M.S. Basu and N.B. Singh 2003. Potential of Groundnut in North-eastern States of India. National Research Center for groundnut (ICAR), Junagadh, India. 76 p.

Singh A.L., M.S. Basu, G.C. Munda, M. Dutta, N.P. Singh, D.P. Patel and M Raychaudhuri 2006. Groundnut Cultivation Technologies for North Eastern Hills of India. National Research Centre for Groundnut (ICAR), Junagadh, India. 50 p.