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Groundut Yields as Influenced by Heat Unit Efficiency, Levels of Fertility and Varieties under Different Growing Environment in Hyper Arid Zone of Rajasthan

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Abstract: A field experiment was conducted during *Kharif* seasons of 2009 and 2010 on effect of four growing environments (20th April, 15th May,9th June and 4th July) and four fertility levels (0,20N:40P_2O_5,30N:60 P_2O_5 and 40N:80 P_2O_5 kg ha^{-1}) on various agronomic traits of two varieties (HNG-10 and TG-37A) of groundnut under semi-arid region of Rajasthan. Semi-spreading variety HNG-10 had yields i.e. pod, kernel, haulm and biological yield were also statistically at par with each other from 20th April to 9th June sowing while days to maturity reduced significantly with delay sowing. Variety TG-37A sown at 4th July had significantly higher yields at 4th July sowing. However, in 9th June sowing had significantly higher heat unit efficiency than all three sowing. Significantly higher yields were recorded in 30 kg N-60 kg P_2O_5 ha^{-1} plots which was statistically at par with 40 kg N-80 kg P_2O_5 ha^{-1}.

Key words: Dates of sowing, Fertility levels, Heat unit, Varieties, Yield.

Groundnut shall continue to be an important oil seed crop for the semi- arid regions if the projected demand of oils and fats has to be mat with sustainability. This calls for a considerable growth in production which has to come mainly from the increase in productivity. Of the several factors responsible for its low productivity, proper date of sowing for varieties of different growth habits and efficient nutrient management are considered as major constraint. In dry land agriculture, farmers have limited choice for sowing time, but in irrigated situation sowing time is one of the most important non- monetary input affecting yield of crops. Time of sowing of groundnut is well documented in other regions (Sardana and Kandhola, 2007). However, in Bikaner region, all the cultivation of groundnut is under irrigated conditions. Groundnut cultivation in Bikaner region was started two decades ago in the command area of Indra Gandhi Nahar Pariyojana (IGNP) and later on it spread to tube well irrigated area of the region. At that time, dust storms were common in the region with minimum vegetation during optimum sowing time of May and June months leading to poor crop establishment due to which the farmers started sowing of groundnut in early summer in the months of April and May for better crop establishment with its harvesting in October-November. This practice is still followed, despite reduction in frequency of dust storms in the region. With increase in the irrigated area the practice of early sowing of groundnut in the area despite reduction in the frequency of hot winds is fast depleting the water table in the majority of the blocks (Anonymous, 2011) and has considerably reduced WUE of canal command area. With reduction in the dust storms limiting crop establishment and in order to stabiles the fast depleting water table and improve in the WUE of the crop, determining suitable sowing time of groundnut varieties of short and long duration maturity would prove a better strategy of improving WUE and the crop productivity. Several workers (Barik *et al.*, 1998; Kabadagi *et al.*, 2010 and Bala *et al.*, 2011) recommended a starter dose of nitrogen until the crop starts nitrogen fixation at about 30 days stage. In the arid region of Rajasthan some workers (Pareek and Poonia, 2011 and Hossain *et al.*, 2007) reported 60 kg N ha^{-1} along with equal level of phosphorus as the appropriate fertilizer level while others recommended 20 kg N ha^{-1} and 32 kg P_2O_5 ha^{-1} for groundnut. Due to the variation in the optimum fertilizer requirement for groundnut reported by research workers it has also become necessary to determine fertilizer requirement for the crop varieties of different maturity under different sowing time. Therefore, an experiment was conducted to investigate on "Yields as Influence by Heat Unit Efficiency, Levels of Fertility and Varieties of Groundnut under Different Dates of Sowing in Arid Western Zone of India"

MATERIAL AND METHODS

Field experiments were conducted during *Kharif* seasons of 2009 and 2010 at Agronomy Farm, College of Agriculture, Bikaner (Rajasthan) under semi-arid conditions. The soil of the experimental site was loamy sand in texture containing 156.33, 16.05 and 221 kg ha^{-1} available nitrogen, phosphorus and potassium, respectively in 0-30 cm soil depth with pH 8.40 and 0.08 per cent organic carbon content. The experiment was laid out in split plot design with three replications, assigning 32 treatments consisting of four date