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Yield maximization of winter groundnut (*Arachis hypogaea* L.) through integrated input management under polythene mulch in the Konkan region of Maharashtra

D.K. KATHMALE AND B.M. KAMBLE

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SUMMARY

The field experiment was conducted at Agronomy Department Farm, College of Agriculture, Dapoli, MS on the lateritic soil to study the role of different components of production technology of groundnut (*Arachis hypogaea* L.) under polythene mulch. The factors considered were *viz*., improved varieties, seed beds, nutrition levels and plant growth regulator. Results revealed that the groundnut genotypes TG 26 and JL 24 equally proved better for yield and quality of groundnut in lateritic soils of Konkan. TG 26 and JL 24 recorded 51 q ha^{-1} and 53 q ha^{-1} dry pod yields, respectively. JL 24 also showed good promise for higher haulm yield in addition to yield and quality. The values of yield and yield attributing characters *viz*., dry pods, kernels, oil and haulm yield, mean number of mature pods per hill, mean weight of pods per hill, 100-pod weight, 100-kernel weight and harvest index and nutrient content and uptake were considerably higher due to application of 50:100:70 kg N, P_2O_5 and Ca /ha (N_3) and 75:150:105 kg N, P_2O_5 and Ca /ha (N_4) than the other treatments under study. Polythene mulched *Rabi* groundnut gave equal pod and haulm yield on both the seed beds *viz*., flat bed and broad bed furrow (BBF). Mean dry pod yield of 51.5 and 52.8 q ha^{-1}, dry haulm yield of 57.9 and 56.7 q ha^{-1}, kernel yield of 38.3 and 39.2 q ha^{-1} and oil yield of 18.7 and 19.2 q ha^{-1} was recorded under FB and BBF, respectively. A foliar application of growth regulator *i.e.* paclobutrazol @ 60 ppm at 25 days after initiation of first flower roughly 52 to 58 days after sowing during *Rabi* season proved better in reducing excessive vegetative growth ultimately reflecting in increased the yield of groundnut. The dry pod, kernel and oil yield was increased significantly due to application of paclobutrazol.

Key words : Groundnut, Polythene mulch, Genotypes, Nutrients, Seed beds, Paclobutrazol

Groundnut is one of the world's staple oil, food and industrial crops and it is grown in about 23.77 million ha in the world extending from tropical to temperate zones in about 100 countries. India is the third largest edible oil producing country in the world after the U.S. and China. The impact of groundnut crop in the oilseed scenario of India and its reflection on the country's economy has been highly significant. Groundnut is dominating other oilseeds of the country by sharing 35 to 45 % of the total area under oilseeds and 45 to 55 % of the total oilseeds production.

Groundnut is grown in the post rainy (*Rabi* / summer) season in about 1.5 million ha with assured moisture with an average yield of 1.5 to 2.0 t ha^{-1}.

Konkan region has the potential for non-traditional area, where groundnut can be grown in both the rainy and the post rainy seasons with the productivity range of 2.0 to 3.0 t ha^{-1}. (Bandopadhhyay and Desai, 2000)

On the global basis, major abiotic stresses, drought, temperature extremes, mineral nutrient deficiencies are most important (Johansen and Nageswara Rao, 1996).

Among the environmental factors, temperature is the most important factor for proper development of crop. Low temperature <18^{0}C in the *Rabi*-hot season at the time of sowing affects germination, whereas higher temperature affects pod development at a later stage. Use of mulches especially polythene mulch is useful for the temperature stress management. The use of polythene mulch to boost the productivity of groundnut was introduced from Japan into China in 1978. Trials with polythene mulched groundnut (PMG) were conducted at Shandong Peanut Research Institute in 1979, resulting in significant increase in pod yield.

Intensification of food grain production resulted in excessive removal of plant nutrients from the soil and hence corrective measures are necessary for sustainability. Groundnut needs large amount of N P K and Ca and various micronutrients. Amount of N fixed by root nodules, N content of the soil and cost: benefit ratio of N application determines rate of nitrogen application. A balanced application of P and N Fertilizers in a ratio of 1:1.5 has observed to be better than single application. When available potassium in the soil is < 128 kg ha^{-1}, then there is a response to potassium. K:Ca:Mg ratio is important than total K, 4:4:2 K:Ca:Mg ratio is observed to be a best ratio for higher yields.

Correspondence to:
D.K. KATHMALE, Zonal Agricultural Research Station, SOLAPUR (M.S.), INDIA
Authors' affiliations:
B.M. KAMBLE, Zonal Agricultural Research Station, SOLAPUR (M.S.), INDIA