

## Physiological basis of yield variation in groundnut genotypes in *kharif* season

D.T. JAGTAP\*, D.J. JADHAV, R.V. KANASE AND R.G. NALAWADE

Department of Agricultural Botany, Ratnai College of Agriculture, Akluj, SOLAPUR (M.S.) INDIA

### ABSTRACT

A study on physiological functions and its relation with yield contributing characters was undertaken and completed at M.P.K.V., Rahuri. From the study, it is revealed that the genotypes J-30 and J-17 performed better during *kharif* season over other eight genotypes studied in respect of per plant number of dry pods, dry pod yield, kernel weight, number of kernels, dry pod yield per hectare, 100 kernel weight, harvest index etc. The study further indicated that the activity and efficiency of dry matter production in physiological growth functions *viz.*, AGR, RGR and NAR had greater influence on yield and yield contributing characters. It was also observed that, there was positive correlation of yield contributing characters with total yield.

**Key words :** Physiological basis, Groundnut genotypes.

### INTRODUCTION

In India groundnut is the king of oilseed crops. India ranks first in area of groundnut cultivation and eighth in productivity in the world. A large variation in growth and yield is seen among the different improved cultivars of groundnut. The growth analysis techniques help in understanding, growth pattern and contribution of various plant parts to economical yield. It also helps in finding out yield contributing characters. Thus, growth analysis forms the basis for manipulation of productivity of the crop. The yield of groundnut is largely influenced by the partitioning of assimilates between reproductive and vegetative parts, the length of pod filling period and the pod setting. In view of these, the present investigation was undertaken.

### MATERIALS AND METHODS

A field experiment was conducted during *kharif*, 2002 at the MAP (Medicinal and Aromatic Plant) Project Farm, Mahatma Phule Krishi Vidyapeeth, Rahuri. The experiment was conducted in a Randomized Block Design with ten genotypes. [*viz.*, J-17 (T<sub>1</sub>), I-09 (T<sub>2</sub>), T-18 (T<sub>3</sub>), I-13 (T<sub>4</sub>), J-30 (T<sub>5</sub>), I-43 (T<sub>6</sub>), ICGS-76 (T<sub>7</sub>), I-10 (T<sub>8</sub>), T-41 (T<sub>9</sub>) and I-23 (T<sub>10</sub>)] of groundnut and replicated three times in rainfed condition. The gross plot size was 3.0 x 2.10 m<sup>2</sup> and net plot size was 2.80 x 1.50 m<sup>2</sup>. The sowing was done by dibbling on 22<sup>nd</sup> July, 2002 with 30 cm x 10 cm spacing. Three randomly selected plants from each plot were tagged and taken as observation plants. The periodic observations were recorded at 30 days interval *viz.*, at 30, 60, 90 DAS and at harvest stage. The observations such as number of per plant mature pods, kernel weight, number of kernel, 100 pod weight, 100 kernel weight, dry pod yield, total dry matter per net plot, shelling percentage, harvest index etc. were recorded at

harvest. Similarly, various physiological growth functions *viz.*, AGR, RGR and NAR were worked out during different growth stages as per the standard procedure given by Radford (1967) and Gardner *et al.* (1988). The data was analyzed as per the standard method of analysis of variance (Panse and Sukhatme, 1985).

### RESULTS AND DISCUSSION

The data on yield contributing characters are presented in Table 1. It is evident from yield data that the differences due to genotypes were statistically significant indicating genetic variation in yield potential. The performance of different genotypes in respect of dry pod yield q/ha was statistically significant.

The genotype J-30 (24.36 q/ha) recorded significantly highest dry pod yield per hectare, over all genotypes. The genotypes J-17 (20.95 q/ha), I-13 (20.87 q/ha), I-09 (19.92 q/ha), ICGS-76 (19.60 q/ha) and T-18 (19.37 q/ha) were at par in per hectare yield with each other. The genotype I-10 (16.90 q/ha) recorded the significantly lowest dry pod yield per hectare over rest of the genotypes. The higher pod yield of the genotypes, *viz.*, T<sub>5</sub>, T<sub>1</sub>, T<sub>4</sub>, T<sub>2</sub>, T<sub>7</sub> and T<sub>3</sub> was mainly due to favorable yield contributing characters like per plant number of kernel, kernel yield, dry pod yield, pod yield per net plot and harvest index. The present investigation had similar trend as seen by Jayalakshmi *et al.* (2000), observed positive correlation of the characters like number of dry pods, dry pod yield, kernel weight and harvest index with yield.

The genotypes as regards to the number of matured pods and number of kernel per plant were statistically significant indicating basic variation in the genetic potential. The genotype J-30 exhibited its superiority in respect of per plant kernel yield and dry pod yield. Harvest index is the best indicator of photosynthetic translocation efficiency