

## Evaluation of effect of growth parameters, leaf area index (LAI), leaf area duration (LAD), crop growth rate (CGR) on seed yield of soybean during *kharif* season

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### ABSTRACT

The field experiment entitled "Evaluation of effect of growth parameters, Leaf area index (LAI), Leaf area duration (LAD), Crop growth rate (CGR) on Seed yield of soybean during *kharif* season. was conducted at the Farm of Post Graduate Institute, Mahatma Phule Krishi Vidyapeeth, Rahuri with a view to study is evaluate the effect of various growth parameters on the seed yield of soybean cultivars. The experiment was laid out in randomized block design (RBD) with 3 replications including eight soybean varieties namely JS- 335, MACS-58, MACS-124, DS-186, PK-472, PK-1029, Arati and Pooja. The observations were recorded during two years (2000 and 2003). In the present studies the pooled data regarding Leaf area index (LAI), Leaf area duration (LAD), Crop growth rate (CGR), showed that, there were significant differences among all varieties at 30-60 DAS, 60-90 DAS and 90 DAS to harvest of crop. The significantly highest pooled mean LAI at 30 DAS was noted of variety MACS-124 and Pooja (2.16), it was at par with variety MACS-58 (2.10). At 60 DAS, the significantly highest pooled mean LAI was seen of variety Pooja (9.03). While the lowest pooled mean LAI was seen of variety JS-335 (3.39). However at 90 DAS, the significantly highest pooled mean LAI was observed in variety Pooja (7.12), while the lowest pooled mean LAI was observed in variety DS-186 (0.33). At 30-60 days significantly highest mean pooled LAD was noticed in variety Pooja (167.90 days), while the lowest pooled mean LAD was noted variety JS-335(70.90 days). At 60-90 DAS The significantly highest pooled mean LAD was seen of variety Pooja(242.40 days). While the lowest pooled mean LAD was observed of variety JS-335(61.10 days). However at 90 DAS to harvest of crop the significantly highest pooled mean LAD was observed of variety Pooja (99.79 days) while the lowest pooled mean LAD was observed of variety DS-186(1.16 days). At 30-60 DAS, significantly highest mean pooled CGR was recorded of variety Pooja(23.41 g/m<sup>2</sup>/day). At 60-90 DAS, the significantly highest CGR was noticed in variety JS-335 (36.13 g/m<sup>2</sup>/day) and lowest was noticed in variety PK-1029 (13.41 g / m<sup>2</sup> / day). However at 90 DAS to harvest of crop the significantly highest CGR was recorded in variety Pooja (27.61 g/m<sup>2</sup>/day) and the lowest in variety PK-1029 (1.04 g/m<sup>2</sup>/day). There was significantly positive correlation of LAI at 30, 60 and 90 DAS with seed yield. There was significant positive correlation of LAD 30-60, 60-90 DAS and 90 DAS to harvest of crop with seed yield. There was significantly positive correlation of CGR (30-60 DAS and 90 DAS to harvest) with seed yield. The pooled data of both the years showed that significantly highest seed yield was recorded in variety Pooja (24.045q/ha) lowest seed yield was noted in variety DS-186 (12.518).

**Key words :** Soybean, LIA, LAD, C.G.R.

### INTRODUCTION

Soybean (*Glycine max* (L.) Merrill) is an important pulse as well as oilseed crop. It has become wonder crop of the twentieth century and is often designated as 'Golden bean'. It is legume crop belonging to family leguminosae and sub family papilionaceae (Jodhavar, 1992; Liu, 1997).

At present soybean has become major oilseed crop covering an area of about 7.3 million hectares with 7.6 million tonnes annual production in India. Maharashtra has become second soybean growing state contributing about 25 % area (18.26 lakh hectares) of the country next to Madhya Pradesh. The area production and productivity of Maharashtra reported during 1991-92 was area (2.74,000 ha) production (1,95,000 MT) and productivity 712 kg/ha. During the year 2002-03 area (12,56,000 ha), production (15,76,000 MT) and productivity (1255 kg/ha) was recorded (Anonymous, 2004). The reason of low productivity of soybean may be due top physiological aspects and hence the study of evaluation of various growth parameters viz. LAI, LAD, CGR was undertaken.

### MATERIALS AND METHODS

The present investigations entitled "Evaluation of effect of 'growth parameters, Leaf area index (LAI), Leaf area duration (LAD), Crop growth rate (CGR) on Seed yield of soybean during *kharif* season. were carried out during *kharif* seasons of the year 2000 and 2003. The details of material used and methods followed are presented in this chapter.

The experiment was laid out in randomized block design (RBD) with three replications including eight soybean varieties namely V1 ) JS- 335 ,V2) MACS-58, V3) MACS-124, V4) DS-186, V5) PK-472, V6) PK-1029, V7) Arati and V8) Pooja. The observations were recorded during two years (2000 and 2003). The recommended dose of fertilizers was given. The various growth observations were recorded at interval of 30 DAS to harvest. The statistical analysis was carried out by the method suggested by Panse and Sukhatme (1985).

### Growth parameters :

Three soybean plants were uprooted at 30, 60, 90 DAS and at harvest the observations were recorded timely and on the basis of collected data various growth functions were

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