

Influence of growth regulators and nutrients on biophysical and biochemical parameters associated with yield potential in Chilli cv. BYADAGI KADDI

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ABSTRACT

A field experiment was conducted during *kharif* 1998, to study the influence of growth regulators and nutrients on biophysical and biochemical parameters associated with fruit yield in Chilli (cv. BYADAGI KADDI). The result revealed that the biophysical parameters viz, photosynthetic rate and transpiration rate had a significant positive association with fruit yield and these were maximum with NAA and CCC treatments. The biochemical parameters viz., nitrate reductase activity, total chlorophyll, carotene and ascorbic acid contents showed positive association with fruit yield, and higher increase with CCC for all these fruits except carotene content.

Key words : Chilli, Cycocel (CCC), NAA, ZnSO₄, FeSO₄, MgSO₄, Miraculan, Cytozyme.

INTRODUCTION

The bio regulation of growth, yield and plant composition by externally supplied synthetic chemicals and nutrients is one of most exciting research areas of the present time. Such bio regulation controlling internal plant metabolism by applying specific growth regulators and nutrients at proper stage of development is of the great significance.

Chilli is an important spice crop and India is largest producer of it in the world. They are good source of vit A and C. In addition to yield, many researchers indicated the influence of growth regulators on biochemical parameters like T.S.S (Hulamani, 1988) and ascorbic acid (Chandra and Shivaraj, 1972; Desai and Patil, 1984) in Chilli. The biophysical and biochemical parameters are known to affect the yield in many ways, as they are inter linked with photosynthetic process. It is better to identify the influence of growth regulators and nutrients on biophysical and biochemical parameters, which have close relationship with fruit yield, with this background, the present study was taken up.

MATERIALS AND METHODS

The experiment was conducted to study the influence of growth regulators and nutrients on productivity potential of chilli variety Byadagi Kaddi during *kharif* 1998 at the main Agricultural Research Station, University of Agricultural Sciences, Dharwad. A field experiment consisted of 15 treatments viz, Cycocel 500 and 1000ppm, NAA 50 and 100ppm, Miraculan 1000 and 2000ppm, Cytozyme 1000 and 2000 ppm, ZnSO₄ 0.25 and 0.50 per cent, FeSO₄ 0.25 and 0.50 per cent, MgSO₄ 0.25 and 0.05 per cent, and control. Laid out in Randomized Block Design with three replications. These growth regulators and nutrients with required concentration were sprayed

at blooming (45DAT) and fruit development stage (65 DAT).

Measurement of various biophysical parameters viz., rate of photosynthesis and transpiration were made at 75 days after transplanting, using a CO₂ Gas-analyser (CI-301) and stomal number was measured by the leaf impression method and the biochemical parameters viz., total chlorophyll, NRA^{ase}, carotene and ascorbic acid contents were measured by following the method of Arnon (1949), Saradhambal *et al.* (1978), Lippert and Hall (1973) and Sadashivan and Manikam (1992) at 75 days after transplanting, respectively. The data on biophysical, biochemical parameters and fruit yield were subjected to statistical analysis as suggested by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

Photosynthesis is the primary process, which form the basis for yield determination. Several workers reported increased rate of photosynthesis with application of growth regulators in soybean (Pankajkumar 1998). In the present investigation it is clear that the growth regulator and nutrient treatments significantly increased the photosynthesis rate and it was maximum with NAA and CCC treatments indicating the role of these chemicals in increasing the rate of photosynthesis, there by increase in the fruit yield (Table 1). The rate of transpiration was also significantly increased due to application of growth regulator and nutrients. If moisture content in the soil is not a limiting factor, then increased rate of transpiration leads to increased dry matter production and consequently the yield. Similar observation of increased yield potential due to higher transpiration rate was also indicated by Pankaj kumar (1998) in Soybean. However, the number of stomata was not influenced by the application of growth