

## Effect of natural resources on plant growth, yield and quality in chilli cultivars (*Capsicum annuum* L.)

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### ABSTRACT

Studies were conducted to know the effect of (Natural Resources) light, relative humidity and temperature on growth, yield and quality characters by growing two varieties of chilli viz., K1 and PKM1 under 3 levels of shade viz., open field condition, 35 and 50 per cent shade during two seasons viz., September 2004 to March, 2005 and June – December 2005 at college orchard of Agricultural College and Research Institute, TNAU, Killikulam. The experiments were laid out in factorial randomized block design and a plot size of 4.5 x 2.2 m was used for each treatment. Observations were recorded on growth, yield and quality characters. In chilli, except for plant height, all the other growth and yield contributing characters registered higher values under open field condition than shade. All the quality characters exhibited higher values under open field condition. Since chilli is a high light and temperature preferring crop, its response was good under open field than shade.

**Key words:** Chilli, Shade, Capsaicin, Capsanthin, Oleoresin.

Chilli is the highest consumed spice in the world. The widely used word chilli usually refers to the hot variant of red pepper. Mostly chilli is grown all over the world and predominantly under tropical condition. Capsaicin and allied pungent principles viz., dihydrocapsaicin and nor-dihydrocapsaicin are the most important pungent components of red pepper. Even though chilli is a tropical crop, changes in climatic factor more so in temperature and light bring about considerable variations in vegetative characteristics, fruit setting and pungent principles.

### MATERIALS AND METHODS

Studies were conducted to know the effect of (Natural Resources) light, relative humidity and temperature on growth, yield and quality characters by growing two varieties of chilli viz., K1 and PKM1 under 3 levels of shade viz., open field condition, 35 and 50 per cent shade during two seasons viz., September 2004 to March, 2005 and June – December 2005 at college orchard of Agricultural College and Research Institute, Killikulam. The experiments were laid out in factorial randomized block design and a plot size of 4.5 x 2.2 m was used for each treatment. Raised beds of 80 cm width were formed with a furrow of 40 cm between two beds. Forty five Days old seedlings were transplanted in paired rows on both sides of the drip laterals adopting a spacing of 60 cm between rows and 45 cm between plants. The recommended dose of N, P and K at 75 : 35 : 35 kg/

hectare was applied through fertigation. Observations were recorded on growth, yield and quality characters viz., plant height, number of branches/plant, fruits/plant, fruit length, fruit girth, mean fruit weight, seeds/fruit, yield/hectare, capsaicin, capsanthin, oleoresin and ascorbic acid contents. Five plants were selected at random in each treatment and each replication for recording plant growth and yield characters. Red ripe fruits obtained from third harvest were utilized for estimating the quality characters.

### RESULTS AND DISCUSSION

In the present study, the results showed that the plants of K1 chilli under 50 per cent shade were significantly taller (273.42, 210.88 cm) and least plant height was recorded in open field condition. (110.95, 95.70 cm) (Table 1 and 2). The least plant height under open field condition might be due to the prevalence of high temperature and light intensity coinciding with early stage of crop growth forcing the plants to attain early reproductive stage. Number of primary branches were more in open field condition in K1 chilli (19.95, 15.10) than shade during both seasons. Since chilli is a light preferring crop, its response was good under open field. Reduced number of primary branches under shade could be due to low light intensity which would have influenced plant hormones, rate of photosynthesis and thus the amount of carbohydrate available for growth, resulting in reduced number of branches. (Krishnamohan *et al.*, 1993) Prevailing weather parameters significantly influenced the yield parameters