International Journal of Plant Sciences, **Vol. 3 No. 2 : 379-381 (July, 2008)**

Effect of growth stage based drip fertigation on dry matter partitioning and yield of cotton

S. AVUDAITHAI
Department of Crop Management, Anbil Dharmalingam Agricultural College and Research Institute, TIRUCHIRAPPALLI, (T.N.) INDIA

(Accepted : March, 2008)

SUMMARY

Field experiments were conducted at Agricultural College and Research Institute, Madurai during Summer 2004 and Winter 2004-05 to study the effect of varying drip irrigation and fertigation regimes to suit the growth stages of cotton variety, SVPR-2 on the dry matter partitioning at harvest. The drip irrigation regimes , I_4, I_5 and I_6 recorded higher leaf and stem fractions compared to the drip irrigation regimes, I_1, I_2 and I_3 at harvest stage. The drip irrigation regime, I_5 was *at par* with I_4 and I_4 was *at par* with I_6 with regard to kapas fraction. The drip irrigation regimes, I_1, I_2 and I_3 were *at par* with drip irrigation regimes, I_4, I_5 and I_6 with regard to bur fraction. Regarding the fertigation regimes, application of N and K in eight unequal splits(F_3) recorded highest stem fraction while application of N and K in ten unequal splits (F_2) recorded highest leaf fraction. Fertigation regimes , F_1 and F_2 were *at par* with regard to kapas and bur fraction. The drip irrigation regimes, I_4, I_5 and I_6 recorded higher yield. Among the fertigation regimes, F_1 was *at par* with F_2 with regard to seed cotton yield.

Key words : Drip irrigation regimes, Fertigation, Split application, Leaf fraction, Stem fraction, Kapas and bur fraction.

Cotton, the king of fibres, occupies a pre-eminent position as a commercial crop both in the developed and developing countries. Though, India ranks first in cotton area, its productivity of 234 kg lint ha^{-1} is only half of the world's productivity level. Hence, there is enough potential to increase the productivity through management practices. Irrigation and fertigation are the most important management factors which influence better growth and plant development, yield and quality of any crop. Drip irrigation and fertigation are proven technologies with the potential for increasing crop productivity, conservation of resources and improving the use efficiency of water and nutrients by cotton. Currently, uniform drip irrigation regime is followed during all the growth stages of cotton which leads to wastage of water. Similarly the nutrient requirement also varies with the stage of the crop. Taking these two points in consideration, this study was undertaken with varying drip irrigation and fertigation regimes suited to various growth stages of cotton and the effect on dry matter partitioning was studied.

MATERIALS AND METHODS

Field experiments were conducted at Agricultural College and Research Institute, Madurai during Summer 2004 and Winter 2004-05 to study the effect of varying drip irrigation and fertigation regimes to suit the growth stages of cotton variety, SVPR-2 and economics of drip irrigation system. The experiments were laid out in split plot design with three replications. Main plot treatments consisted of six drip irrigation regimes with WAF, 0.25 : 0.75 : 0.6 (I_1), 0.25 : 0.75 : 0.8 (I_2), 0.25 : 0.75: 1.0 (I_3), 0.5 : 1.0 : 0.6 (I_4), 0.5 : 1.0 : 0.8 (I_5) and 0.5 : 1.0 : 1.0 (I_6), imposed at 0-45 DAS, 45-120 DAS and 120-165 DAS, respectively. Sub plot treatments consisted of three fertigation regimes, *viz.*, ten equal splits of N and K (F_1), ten unequal splits of N and K (F_2) and eight unequal splits of N and K (F_3). In F_1, 20 per cent NK was given during 0-30 DAS, 60 per cent NK during 30-90 DAS and 20 per cent NK during 90-120 DAS. In F_2, 10 per cent NK during 0-30 DAS, 80 per cent during 30-90 DAS and 10 per cent during 90-120 DAS was given. In F_3, 20 per cent NK was given during 0-30 DAS and 80 per cent NK was given during 30-90 DAS. Plant samples were collected to find out the dry matter production and the samples collected at harvest were fractionated immediately into stems, leaves, kapas and bur and respective dry weights recorded. The seed cotton yield was recorded and expressed in kg ha^{-1}.

RESULTS AND DISCUSSION

Leaves fraction:

Drip irrigation regimes with WAF, 0.5 : 1.0 : 0.6 (I_4) was *at par* with WAF, 0.5 : 1.0 : 1.0 (I_6) and 0.25 : 0.75 : 1.0 (I_3) during Summer(Table 1). Drip irrigation regime with WAF of 0.25 : 0.75 : 0.6 (I_1) was *at par* with WAF of 0.25 : 0.75 : 1.0 (I_3) during Winter (Table 2). I_2, I_4, I_5 and I_6 were *at par*. Fertigation with ten unequal splits of N and K (F_2) recorded significantly the maximum leaf