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STUDY OF SOIL MOISTURE DEPLETION

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ABSTRACT

Soil dampness save exhaustion in the non-wetted region of the flooded medicines was more noteworthy than that of the wetted ones of similar medicines yet about the equivalent to that of the non-watered treatment. Soil dampness holds exhaustion in the non-wetted region of the flooded and non-watered medicines that happened primarily (60-70%) during May-June. Soil dampness was arrived at a shrinking rate during September in the non-wetted region of the watered medicines and during August in the space of the non-flooded ones. All-out soil dampness save exhaustion was for the most part more noteworthy in the further soil layers of the wetted regions and in the upper soil layers of the non-wetted regions. The measure of water system water utilized was higher at - 0.02 MPa than at - 1.5 MPa however it was not eminently unique among trickle and bowl techniques inside similar soil water expected levels.

KEYWORDS: Soil moisture, Depletion, MUE, MUR.

INTRODUCTION

The soil moisture depletion (mm) at various growth periods was studied at 30 days interval and at different soil depths (0-30, 30-60, 60-90 and 90-120 cm), consumptive use of water (mm), moisture use efficiency (kg/ha/mm) and moisture use rate (mm/day) were also determined in various treatments at the same time and the data for both the seasons have been set out in the tables.

Soil moisture depletion and consumptive use (mm) = The data tabulated in clearly revealed that consumptive use of water was more (152.6 mm) in first year than in second year (141.5 m). Between seasons, CU was more in 1989-90, in first year it was more in pure wheat (149.8 mm) than pure linseed (141.1 mm) but in second year wheat and linseed were almost similar (Wheat 138.1 mun; linseed 138.6 mm) in these values. When linseed was inter- planted with wheat in W_1ik, row ratio the CU was more (157.7 mm in 1989-90; 150.4 mm in 1990-91) whereas the differences for two row ratios (W2L, and W4L) was least in both the years. The nitrogen-applied crop attained higher CU values (151.67 mm in 1989-90; 141.1 mm in 1990-91) than the no nitrogen applied crop (149.0 mm in 1989-90; 139.2 mm in 1990-91).

The data on periodic moisture depletion pattern indicated that upto 30 days moisture depletion was low (5.2 and 12.9%), but it improved later at 90 days to 13.30% in 1989-90 and to 17.56% in 1990-91. In the subsequent two months due to the commencement of a dry period the depletion was still less and it was 3.5% in 1989-90 and 13.21% in 1990-91, at 120 days, it reduced further to 2.04 and 1.90% in 1990-91.

Soil moisture depletion (mm)

The data in the Table revealed that in 1989-90 the moisture depletion from all soil depths was more in pure wheat than in pure linseed, in the second year, linseed had an edge over wheat between 60-120 days of the crop age. Though the pattern of depletion at different soil depths did not differ much due to interplanting linseed, the system W_1:L maintained its superiority over the other systems in extracting higher amount of moisture from different soil depths. In first year the trend in rate of moisture depletion did not differ in case of nitrogen-applied crops but the nitrogen applicated crops removed slightly higher moisture from 60-90 cm depths. Similar trend was observed in 1990-91 where depletion was more over the first year.

Moisture use efficiency (MUE) and moisture use rate (MUR)

An examination of data pure wheat recorded lower MUE than pure linseed and inter planted these values increased over the pure wheat crop. Linseed had maximum MUE (1989-90, 18.37; 1990-91, 20.78 kg/ha/mm) than to wheat crop (1989-90, 18.00; 1990-91, 15.72 kg/ha/mm). Wil system gave more value than pure wheat and other inter-cropping systems. It indicated a decreasing trend with every increase in plant density levels from W_2il_1 to W_1ib. The nutrigen-applied crops used water more efficiently at 25,50 and 75 kg N/ha, the MUE in first year for these rates was 17.65, 20.04 and 19.75 kg/ha/mm respectively, the corresponding values for second year were 16.96, 18.69 and 18.09 kg/ha/mm.

Economics of production

The total cost incurred (Rs/ha) in growing the crop/ crops in each treatment was worked out by adding the cost of inputs, land, rent and interest on the working capital. Net returns (Rs/ha) was calculated after deducting the cost from the total returns realised from sale of the farm produce in each treatment. Net return per rupee spent was worked out after dividing the net returns by the total expenditure. This was done to compare costs and profits in each treatment. The data are presented in Table the other details worked out for various cost components.

The net profits gained in the two crop seasons because of large variation in yields and selling price showed large differences. In first seasons, because of high rainfall (101.3 mm) the net profit from pure wheat (Rs.4222.00) and pure linseed (Rs.4042.35) were high. In the second season which was a dry year (rain fall 56.4 mm) the net profits reduced

Intercropping and nitrogen application

Intercropping and nitrogen application changed the values of net returns in each treatment. W:L, system recorded maximum profit Rs. 3458.15/ha in 1989-90 and Rs.3472.25/ha in 1990-91, the profits reduced in W2:L and W_1:L, systems. The reduction, however, was slightly more in first season at a plant density of 100% (Rs.2626.35/ha) but in second season the reduction was much less (Rs.2687.75/ha). The W_{11} system registered less profits in both the seasons (Table).

Application of nitrogen increased profits in both the years .25 kg N/ha gave an additional profit of Rs.1820.95/ ha in first year and Rs.745.15/ha in second year, 50 kg N/ha recorded a profit of Rs.6239.80/ha in 1989-90 and Rs.5502.05/ha in 1990-91. Application of 75 kg N/ha recorded a profit of Rs.6636.05/ha in first year and Rs.5961.85/ha in second year.

The net return per rupee spent in pure linseed were maximum in both seasons. (1989-90, 1.67; 1990-91, 2.09). This was due to less cost of linseed cultivation. W:L_1 system obtained more amount than W:L, and W2:1, systems. Nitrogen application to systems enhanced net profit/rupee spent. The net return/rupee spent was lowest in no nitrogen treatment (Table). It increased to maximum at 75 kg N in both the seasons followed by 50 kg and 25 kg N/ha.

CONCLUSION

Water system booking, on the off chance that applied in view of the dirt water status would give significant returns. Notwithstanding; the water system profundity range changes essentially during wet and dry years, for every single such procedure, which use water system trigger strategy for soil dampness portrayal levels, to arrive at specific percent of promptly accessible water, or all out accessible Water system given based on development stages, show water pressure explicitly in beginning stages. Further, water system of more modest profundity (as seen in Wheat), applied every now and again during various stages would improve yield, water use effectiveness, and water system water use productivity, as opposed to rare and huge amount of water systems.

During reenactment for the rice crop, the standing water over the ground isn't thought of, and consequently the abundance water system or precipitation after immersion of soil creates surface run off. Notwithstanding, its effortlessness of use and confirmation of expected yield, makes it more pervasive among the ranchers. The water system water request is autonomous of climatic varieties. Crops under this methodology move past flooded in Kharif season, as the water system stretch can't be changed. as per the overarching soil dampness conditions because of the precipitation occasions. Nonetheless, decrease of water system profundity during the underlying vegetative stage can confine over water system to specific degree. In regions where ground water is shallow, and showing rising pattern; the technique S I is suggested during Kharif season. Methodology S II has huge fluctuation in scope of water system profundity, demonstrating the responsiveness of technique towards precipitation, soil dampness, and climatic circumstances. In methodology S II, assuming fixed profundity water system is a lot more noteworthy than Crude profundity, it brings about more noteworthy misfortunes, because of permeation, prompting lower water system water use effectiveness. 13. Measure of water system profundity should be painstakingly settled, for technique S II in blocks having sandy earth soil, on the grounds that the worth of Crude is low. In starting vegetative stage the water system profundity in different soils, should be chosen warily. As the planning of water system, is profoundly subject to climatic variety and precipitation, its execution is testing. Water system with this procedure is doable, in the event that water system is set off by checking the dirt dampness deficiency, with assistance of mechanized sensors introduced to survey the dirt dampness status. On the off chance that last water system is cut off ahead of schedule, with respect to crops like wheat, sugarcane and so forth, to acquire great yield, according to winning practices, dampness stress might be noticed.

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