Research Note

MULCH TYPES FOR SOIL MOISTURE RETENTION IN DRIP IRRIGATED SUMMER AND WINTER PEPPERS[1]

Mulching contributes to increased efficiency of available moisture for crop production[2]. This technique has been successfully practiced in Israel, Australia, and the United States, in drip irrigated vegetables[3].

A study to determine the possibility of using different mulch types for peppers production was conducted at the Fortuna Agricultural Research and Development Center, Juana Díaz, in the southern semiarid region of Puerto Rico[4]. The soil belongs to the San Antón soil series. The objective of this study was to evaluate the effects of transparent (clear), white, black, silver coated, black plastic, organic mulch and non-mulching on soil moisture conservation.

Maximum air temperature during the crop season was 32.2° C for winter peppers and 33.4° C for summer peppers. Minimum Air temperature was 15° C for winter and summer peppers. The soil moisture conservation was monitored by the use of tensiometer installed at 15 cm depth in the soil and 15 cm away from the drip line in each plot. The tensiometer readings were recorded on alternate days at 7:00 a.m. Irrigation was applied when the average soil tension in each treatment was 45 cbr and was terminated when the soil tension decreased to 10 cbr.

Soil tension values were higher in the non-mulching compared with the other mulching treatments during winter and summer. It implies that mulching conserved more moisture compared with non-mulched plots. This agrees with other authors who reported that this increase was attributed to reduced evaporation and the inhibition of weed growth in the mulched treatment [2, 3, 5, 6]. Plastic mulching was more efficient in water conservation than the organic mulching. Both were more efficient than the non-mulched plots. The soil tension values for the mulched and

[1] Manuscript submitted to Editorial Board December 17, 1985.

[2] Waggoner, P. E., P. M. Miller and H. C. de Rao, 1960. Plastic Mulching: Principles and Benefits. Connecticut Agric. Exp. Stn. New Haven, Bull 634.

[3] Hopen, H. J. and N. F. Oebker, 1976. Vegetable Crop Responses to Synthetic Mulches. An Annotated Bibliography. NAPA Bull No. 1 by Nat. Agric. Plast. Assoc., Maryland.

[4] This study was conducted under H-326(S-143) Southern Region Research Project—"Trickle Irrigation in Humid Region". This study is based upon MS Thesis by L.E. Rivera.

[5] Schales, F. D. and R. Sheldrake, 1963. Mulch effects on soil conditions and tomato plant response, Proc. 3rd Nat. Agric. Plast. Conf. 4: 78–90.

[6] Lal, R., 1975. Role of mulching technique in tropical soil and water management. ITTA Tech. Bull. No. 1, Int. Inst. Trop. Agric. Ibadan, Nigeria.

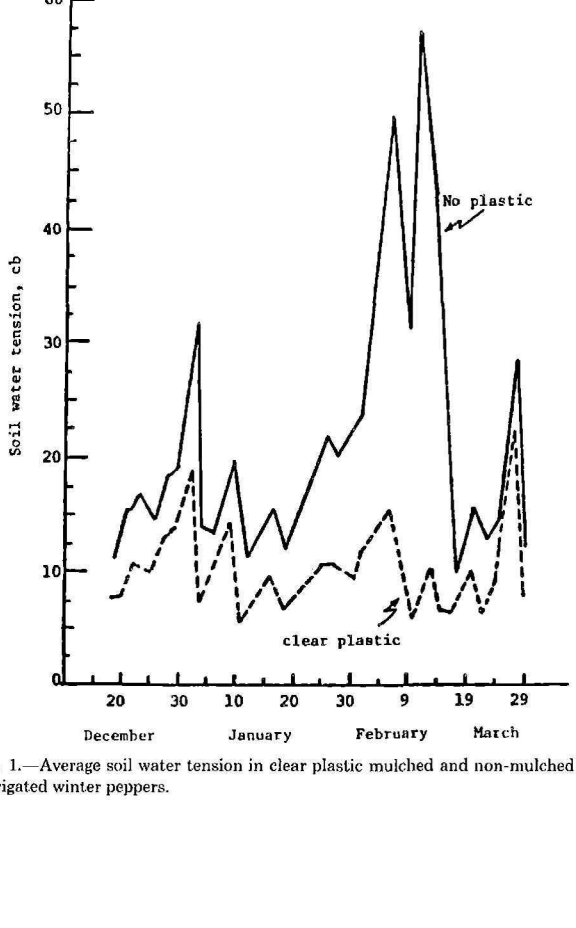

FIG. 1.—Average soil water tension in clear plastic mulched and non-mulched plots in drip irrigated winter peppers.

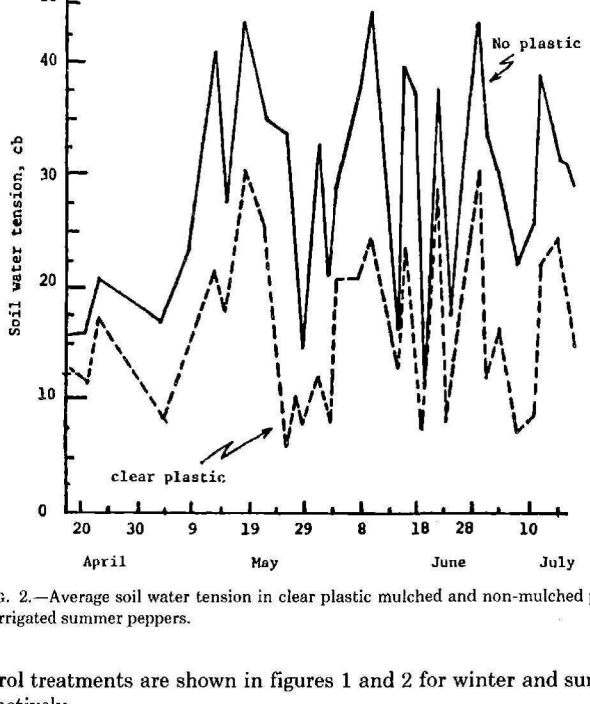

FIG. 2.—Average soil water tension in clear plastic mulched and non-mulched plots in drip irrigated summer peppers.

control treatments are shown in figures 1 and 2 for winter and summer, respectively.

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