

Effect of Different Weed-free Regimes on Weed Growth, Growth and Yield of Bunch Groundnut

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Experiments were conducted at the Agricultural Research Station, Bhavanisagar to determine the critical period of weed free environment for POL 2 groundnut under irrigated conditions. It was found that no weeding is required beyond the sixth week of sowing, the first 40 per cent of growth period being the critical period of crop-weed competition. Pod yield increased progressively with increase in the weed-free regime upto six weeks beyond which there was no further increase. This increase was a reflection more of an increase in pod number than in any other yield constituent. It was also due to lesser weed count and dry matter under this regime.

Groundnut foliage being slow in formation and shallow in depth, weed menace assumes greater proportions in this crop than in others. The extent of yield loss due to weed infestation can be as high as 60-70 per cent (Schiller *et al.*, 1976; Hamdoun, 1976) underlies the importance of keeping the crop free from weed growth. However, reports available on the period up to which the crop should be kept weed free are inconsistent with one another. This periods of two weeks (Schiller *et al.* 1976), three weeks (Hill and Santemann, 1969), four weeks (Hauser *et al.*, 1975; Singh and Gupta, 1977 and even eight weeks (Hauser *et al.*, 1973; Rethinam *et al.*, 1976) have been cited as the critical periods of weed free environment. Because of these conflicting reports an experiment was designed to determine the critical period under irrigated conditions of Tamil Nadu.

MATERIAL AND METHODS

The experiment was conducted on a red sandy loam soil at the Agricultural Research Station, Bhavanisagar for two seasons, viz., monsoon 1976 and summer 1977 in a randomised block design replicated thrice. The treatments comprised weed free regimes of 2, 4, 6, 8, 10 weeks (W_2 to W_6) and through out (W_7) besides control (W_1). Seeds of bunch POL 2 groundnut, were dipped at 125 kg/ha in rows 22.5 cm apart at intervals of 15 cm in plots measuring 3.6×3.6 m. A basal dose of 20 kg N, 40 kg P_2O_5 and 60 kg K_2O per ha was applied at the time of sowing. At maturity, the following observations were recorded (1) weed count and dry matter (2) plant height (3) branches/plant (4) nodules/plant (5) root wt/plant (6) pods/plant (7) kernel wt. (8) shelling percentage and

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(9) pod yield (Tables I and II). Weed count and dry matter were recorded following Burnside and Wicks (1965).

RESULTS AND DISCUSSION

i) Effect of the different weed-free regimes on weed growth:

Upto four week weed-free regime, no reduction in weed count was apparent compared to unweeded check. Reduction was evident only under the six week period. Further increase in the duration of weed free environment had no further mitigating effect. The trend of results on weed dry matter was a replica of that on weed count. Earlier workers (Naidu *et al.*, 1977; Gowda *et al.*, 1977) have also reported weed dry matter to be less under the six week weed free treatment.

ii) Effect of different weed-free regimes on growth components:

While number of branches was not modified by the weed-free environment, plant height was distinctly more in the unweeded check and two week weed free treatment due to competition for sunlight under the high weed density. Unchecked weed growth restricted nodule production by 27 per cent and root weight by 32 per cent. In monsoon, maximum nodule number was obtained only under the 10 week period. In summer, however, nodule number was the same under all regimes barring the two week period. Root weight under the two week weed-free condition was reduced to the same

extent as under the unweeded check, while in monsoon with increase in the period of weed-less environment, there was a concomitant increase in root weight up to six week period, no such phenomenon was evident in summer, almost all regimes being on a par.

iii) Effect of weed free regimes on pod yield and yield attributes:

Differences in pod yield were primarily a reflection of the differences in mature pod number/plant. In both cases, there was progressive increase with increase in duration of the weed-free period up to six weeks, beyond which no increase was discernible. Increased shelling percentage was also noticeable in monsoon only under six week weed free period. Reduction in pod yield under the unweeded control is also attributable primarily to reduction in pod number, the other components *viz.* shelling percentage and kernel weight being affected only slightly in comparison. Thus, the critical period of crop weed competition is observed to be six weeks which is consistent with the findings of Drennan and Fennings (1977). The contention of Gowda *et al.* (1977) that a weedless environment from sowing to harvest recorded the maximum pod yield could not be confirmed in the present study. The first six weeks constitute the first 40 per cent of the total crop growth period. But Kasasian and Seeyave (1969) reported the period comprising the first 25 to 30 per cent of the total crop growth period to be the most vulnerable.

TABLE I Weed growth, growth Components, yield attributes and yield of Pol 2 groundnut under different weed-free regimes (Monsoon, 1976)

| Weed free regime | Weed count/ m ² | Weed dry matter g/m ² | Plant height (cm) | Branches/ plant | Nodules/ plant | Root wt./ plant (g) | Pods/ plant | 100 kernel Wt. (g) | Shelling % | Pod yield (kg/ha) |
|------------------|-------------------------------|-------------------------------------|----------------------|--------------------|-------------------|---------------------------|----------------|--------------------------|---------------|-------------------------|
| W ₁ | 315 (2.49) | 13.5 (1.63) | 59.4 | 4.5 | 9.4 | 1.32 | 12.3 | 27.5 | 68.0 | 1827 |
| W ₂ | 213 (2.32) | 26.4 (1.42) | 56.7 | 4.6 | 11.0 | 1.54 | 14.9 | 27.7 | 68.3 | 1960 |
| W ₃ | 145 (2.16) | 23.7 (1.37) | 46.3 | 4.8 | 11.8 | 1.81 | 17.3 | 28.1 | 69.1 | 2134 |
| W ₄ | 41 (2.61) | 12.8 (1.10) | 48.6 | 4.6 | 12.1 | 2.16 | 19.7 | 28.6 | 69.9 | 2434 |
| W ₅ | 32 (1.50) | 5.0 (0.70) | 50.1 | 4.5 | 12.1 | 2.03 | 20.5 | 28.7 | 70.0 | 2563 |
| W ₆ | 24 (1.35) | 5.2 (0.71) | 49.6 | 4.5 | 12.4 | 2.05 | 20.9 | 28.7 | 70.5 | 2561 |
| W ₇ | — | — | 47.8 | 4.8 | 12.8 | 2.27 | 20.3 | 28.6 | 70.2 | 2422 |
| SED | (0.16) | (0.11) | 1.5 | 0.5 | 0.3 | 0.08 | 0.7 | 0.1 | 0.3 | 40 |
| CD 5% | (0.51) | (0.36) | 4.7 | N.S. | 1.1 | 0.25 | 2.2 | 0.5 | 1.1 | 128 |

Figures in parentheses indicate transformed values

TABLE II Weed growth, growth components, yield attributes and yield of POL-2 groundnut under different weed-free regimes (Summer, 1977)

| Weed-free regime | Weed count/ m ² | Weed dry matter (g/m) | Plant height (cm) | Branches/ plant | Nodules/ weight/ plant(g) | Root weight plant(g) | Pods/ plant | 100 kernel weight (g) | Shelling (%) | Pod yield (kg/ha) |
|------------------|-------------------------------|--------------------------|----------------------|--------------------|---------------------------------|-------------------------|----------------|-----------------------------|--------------|----------------------|
| W ₁ | 201 (2.30) | 19.0 (1.27) | 48.7 | 4.5 | 10.8 | 2.09 | 17.4 | 33.3 | 70.9 | 2303 |
| W ₂ | 116 (2.06) | 12.8 (1.10) | 46.2 | 4.6 | 12.1 | 2.49 | 21.0 | 34.7 | 72.4 | 2872 |
| W ₃ | 108 (2.03) | 8.7 (0.94) | 43.6 | 4.7 | 14.2 | 2.67 | 24.3 | 35.0 | 73.6 | 3092 |
| W ₄ | 19 (1.27) | 1.5 (0.19) | 41.5 | 4.6 | 14.6 | 2.77 | 27.7 | 34.6 | 74.1 | 3272 |
| W ₅ | 12 (1.07) | 1.3 (0.13) | 42.4 | 4.6 | 14.8 | 2.79 | 26.2 | 34.5 | 73.5 | 3376 |
| W ₆ | 12 (1.07) | 1.9 (0.29) | 43.3 | 4.6 | 14.5 | 2.80 | 28.5 | 34.6 | 74.2 | 3402 |
| W ₇ | — | — | 42.2 | 4.8 | 14.8 | 3.10 | 25.7 | 34.9 | 74.7 | 3294 |
| SED | (0.12) | (0.15) | 0.6 | 0.6 | 0.3 | 0.13 | 1.0 | 0.1 | 0.3 | 46 |
| C.D.5% | (0.40) | (0.47) | 1.8 | N.S. | 1.1 | 0.44 | 3.2 | 0.5 | 0.9 | 143 |

Figures in parentheses indicate transformed values

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