

Table 51. Mean values of yield and yield components of white yam as affected by duration of weed interference in the field (1978-79).

| Duration of weed interference | L A I (at 12 W A P) | | Time (weeks) to 100% tuber initiation | | Fresh tuber yield (t/ha) | |
|-------------------------------|------------------------|----------|---|------|-----------------------------|----------|
| | 1978 | 1979 | 1978 | 1979 | 1978 | 1979 |
| W. F. M. | 0.55 ab ¹ | 0.58 a | 12 a | 10 a | 20.08 a | 17.57 a |
| W. I. 4 | 0.87 a | 0.21 cd | 14 d | 10 a | 18.75 ab | 17.40 a |
| W. I. 8 | 0.29 b | 0.18 d | 14 a | 10 a | 13.96 bc | 13.91 a |
| W. I. 12 | 0.22 b | 0.16 d | 14 a | 10 a | 12.47 bc | 7.40 bc |
| W. I. 16 | 0.29 b | 0.04 d | 14 a | 10 a | 6.47 d | 6.06 bc |
| W. I. 20 | 0.21 b | 0.06 d | 14 a | 10 a | 6.58 d | 3.24 c |
| W. I. 24 | 0.30 b | 0.02 d | 14 a | 10 a | 4.88 d | 1.89 c |
| W. I. M. | 0.24 b | 0.06 d | 14 a | 10 a | 6.03 d | 2.12 c |
| Weeded 3 + 8 + 12 | 0.94 a | 0.74 a | 14 a | 10 a | 19.71 a | 12.25 bc |
| Weeded 3 + 8 + 12 + 16 | 0.82 a | 0.55 bcd | 14 a | 10 a | 20.88 a | 17.28 a |

¹Means followed by the same letter in the same column are not significantly different at the 5% level of the Duncan's New Multiple Range Test.

In the absence of weed interference, dry matter production in yam vines and leaves peaks in phase II (vegetative growth stage) and phase III (tuber bulking growth stage). Weed interference during these periods severely reduces growth in those organs, and this reduction during phases II and III (12-16 weeks after planting) interferes with assimilate production necessary for optimum tuber bulking in the later part of phase III.

Dry matter production in weeds peaked at 8-12 weeks and declined thereafter, indicating that the maximum competition occurred during this period. Decline in tuber yield was also most pronounced at this period (Fig. 48).

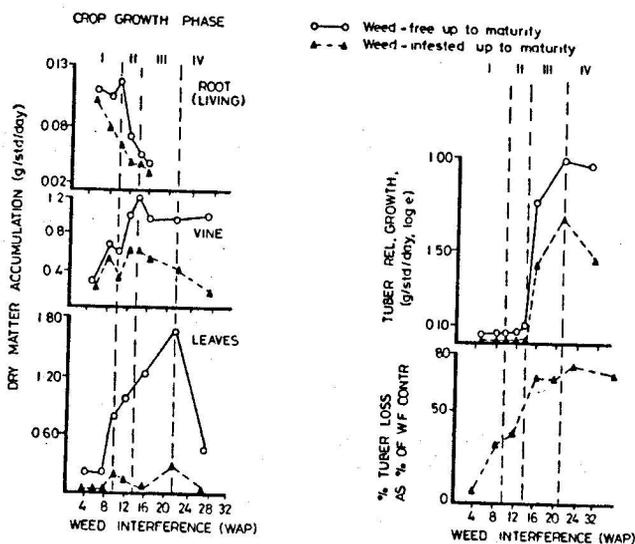


Fig. 48. Effect of weed interference on yield and yield components in yam.

Herbicide persistence in tropical soils

Field experiments were carried out at IITA and Onne to determine the persistence of some selected commonly used preemergence herbicides in the 2 ecologies. Atrazine, metolachlor and fluometuron were each applied at

3.0 and 6.0 kg/ha while pendimethalin was sprayed at 2.5 and 5.0 kg/ha on a conventional-tillage plot using a knapsack sprayer calibrated to deliver 200 l/ha spray volume. Herbicide persistence was monitored by a bioassay method involving tomato seedlings for atrazine and fluometuron and rice seedlings for metolachlor and pendimethalin.

Atrazine and metolachlor each at 3.0 kg/ha were less persistent than fluometuron and pendimethalin (Fig. 49). Generally, all herbicides were more persistent at IITA (rainfall 1,400 mm) than Onne (rainfall 2,400 mm). Atrazine at 3.0 and 6.0 kg/ha was present in soils at IITA at nonphytotoxic levels at 8 and 12 weeks after treatment, respectively (Fig. 50). The persistence of metolachlor closely followed that of atrazine while fluometuron and pendimethalin showed pronounced persistence at IITA at both low and high rates. Fluometuron, especially at a high rate, persisted beyond the test period in the IITA soil. Pendimethalin at 2.5 kg/ha persisted at high levels for more than 8 weeks after treatment, but existed at very low levels at 12 weeks after treatment.

Persistence of atrazine in soils at Onne was very short and had declined to non-phytotoxic levels by 8 weeks after treatment (Fig. 49). Doubling the rate of atrazine did not increase its persistence. Metolachlor applied at a high rate persisted in Onne for more than 8 weeks after treatment. Fluometuron could not be detected in the top soil at Onne by 12 weeks after treatment. Persistence of pendimethalin was identical at both IITA and Onne, irrespective of rates used.

While an atrazine sensitive crop could be planted at IITA and Onne locations at 12 weeks after treatment, a fluometuron sensitive crop could not be safely grown under soil and rainfall conditions at IITA within 12 weeks after treatment. All herbicides tested in soils at Onne were either nontoxic or had very low herbicidal activity at 12 weeks after treatment.

Plantain improvement

Previous greenhouse trials indicated that growth regulators applied close to the meristem of young plantain (*Musa* sp.) suckers changed growth hormone balance and sucker development. This suggested the potential