number of plants for the combination of characters obtained under each cross (Table 2) indicated that the crosses B and D had relatively high potentiality compared to other crosses.

REFERENCES

ALLARD, R. W. and P. E. HANSCHE, 1964. Some parameters of population variablity and their implications in plant breeding. *Advan Agron 16* : 281-235

FINKNER, V. C., C. G PONELEIT and D. L. DAVIS. 1973. Heritablity of rachis node number of *Avena sativa* L. *crop. Sci.*. *13* (1) : 84-85.

GOULDEN, C. H. 1952. *Methods of statistical Analysis*. John wiley and sons Inc., New york.

Mc GINNIS, R C and L. H. SHEBESKI 1968. The reliability of single plant selection in F2. *Third International wheat Genetics symposium*, 410-15.

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# EFFECT OF INTERCROPPING OF PULSES AND SUNFLOWER ON THE INCIDENCE OF SUCKING PESTS OF RAINFED COTTON

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Incidence of sucking pests in cotton based intercropping system was studied in crop combinations of cotton + greengram, cotton + blackgram, cotton + cowpea, cotton + sunflower and cotton + lablab raised in paired rows and were compared with sole crops of cotton, blackgram, greengram, cowpea, lablab and sunflower. The population of leafhopper was significantly less in cotton when intercropped with sunflower, greengram and blackgram. Contrary to this, aphid infestation was less in pure crops of greengram, blackgram and sunflower compared to crop combinations. Among the crop combinations tested, cotton + greengram recorded the highest gross income.

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Pest outbreaks are commonly less in mixed stands due to crop diversity than in sole stands. This regulation of pests in intercropping systems occurs either by physical means or by biological interference as reported by Litsinger and Moody (1976) and Van Embden and Willams (1974).

The intercropping system helps a single crop from damage of pests by its compensatory ability or loss of stand in the other crop thereby maintaining an overall stability of production (Bhatnagar and Davies, 1978). In view of its benefits, experiments were conducted to study the effect of intercrops of pulses and sunflower on the incidence of sucking pests in cotton and the results are presented.

## MATERIALS AND METHODS

Two field experiments were conducted during 1985-87 in a randomised block design, replicated thrice with eleven treatments with MCU 10 cotton having a plot size of 40 $m^2$ at Regional Research Station, Paiyur during the winter seasons of September to March under rainfed situation. Cotton was the base crop raised in paired rows at 30 cm between rows and 60 cm between pairs of rows with the following intercrops:

| | | |
|---|---|---|
| $T_1$ | Cotton + greengram (Paiyur 1) | - paired rows |
| $T_2$ | Cotton + blackgram (Co. 5) | - paired rows |
| $T_3$ | Cotton + cowpea (Paiyur 1) | - paired rows |
| $T_4$ | Cotton + sunflower (Suf. 3) | - paired rows |
| $T_5$ | Cotton + lablab (Mochai/DPI 1281) | - paired rows |
| $T_6$ | Cotton alone | - 45x25 cm |
| $T_7$ | Blackgram alone | - 30x10 cm |
| $T_8$ | Greengram alone | - 30x10 cm |
| $T_9$ | Cowpea alone | - 45x15 cm |
| $T_{10}$ | Lablab alone | - 30x20 cm |
| $T_{11}$ | Sunflower alone | - 45x20 cm |

Observations were made on the incidence of sucking pests viz., leafhopper, aphid and whitefly from 5 plants at random on cotton and 10 plants on intercrops at weekly intervals. The data on population of pests were converted into $\sqrt{x + 0.5}$ and were subjected to statistical analysis along with yield data.

Table 1 Data on population of sucking pests, yield and grossincome during 1985-86

| Treatment | Mean population/leaf | | | Yield (kg/ha) | | Gross income (Rs.) |
|---|---|---|---|---|---|---|
| | Leaf-hopper | Aphid | White-fly | Base crop | Inter crop | |
| Cotton+greengram (Paiyur 1) | 1.06 (1.03) | 24.66 (4 96) | 2 34 (1.53) | 583 | 164 | 3856 |
| Cotton+blackgram (CO 5) | 1.19 (1.09) | 25.14 (5.01) | 2 62 (1.62) | 489 | 112 | 2698 |
| Cotton+cowpea (Paiyur 1) | 6.71 (2.59) | 26 01 (5.10) | 2.86 (1.69) | 410 | 117 | 2518 |
| Cotton+sunflower (Suf. 3) | 1.14 (1.07) | 30.25 (5 50) | 2 79 (1 67) | 380 | 86 | 2158 |
| Cotton+lablab/mochai (DPI 1281) | 1.44 (1.20) | 31.47 (5.61) | 2.69 (1.64) | 366 | 97 | 2238 |
| Cotton alone | 8 01 (2.83) | 23.14 (4.81) | 4.77 (2.18) | 590 | — | 2950 |
| Blackgram alone | 4.75 (2.18) | 8.76 (2 96) | 2.59 (1.61) | — | 188 | 752 |
| Greengram alone | 4 20 (2.05) | 7.78 (2 79) | 2.62 (1.62) | — | 157 | 628 |
| Cowpea alone | 9.42 (3.07) | 16.55 (4.07) | 2.79 (1.67) | — | 219 | 876 |
| Lablab alone | 6.97 (2.64) | 11.49 (3.39) | 2.79 (1.67) | — | 121 | 484 |
| Sunflower alone | 7.13 (2.67) | 7.13 (2.67) | 2.76 (1.66) | — | 151 | 604 |
| CD (P=0.05) | 0.19 | 0.68 | NS | | | 123 |

Figures in parentheses are $\sqrt{x+0.5}$ transformed values.

Tables 2. Data on population of sucking pests, yield and grossincome during 1986-87.

| Treatments | Mean population/leaf | | | Yield (kg/ha) | | gross income (Rs) |
|---|---|---|---|---|---|---|
| | Leaf hopper | Aphid | Whitefly | Base crop | Inter crop | |
| Cotton+greengram (Paiyur 1) | 1.17 (1.08) | 18.32 (4.28) | 2.59 (1.61) | 565 | 151 | 3353 |
| Cotton+blackgram (Co. 5) | 1.21 (1.10) | 16.16 (4 02) | 2.59 (1.61) | 500 | 93 | 2872 |
| Cotton+cowpea (Paiyur 1) | 6.55 (2.56) | 21.25 (4.61) | 2.72 (1.65) | 426 | 121 | 2553 |
| Cotton+sunflower (Suf 3) | 0.98 (0 99) | 20.25 (4.50) | 2.79 (1.67) | 372 | 46 | 1998 |
| Cotton+lablab (DPI 1281) | 1.12 (1.06) | 25.10 (5.10) | 2.99 (1.73) | 344 | 98 | 2063 |
| Cottonalone | 6.86 (2.62) | 13.99 (3.74) | 4.81 (2.19) | 668 | — | 3340 |
| Blackgram alone | 7.36 (2.71) | 11.34 (3.37) | 2 69 (1.67) | — | 193 | 792 |
| Greengram alone | 5.24 (2.29) | 9.76 (3.12) | 2.79 (1.67) | — | 136 | 544 |
| Cowpea alone | 6.31 (2.51) | 12.42 (3.52) | 2 82 (1.67) | — | 202 | 808 |
| Lablab alone | 8.24 (2.87) | 13.47 (3.67) | 2.79 (1.67) | — | 106 | 371 |
| Sunflower alone | 9.32 (3.05) | 14.19 (3.77) | 2.76 (1.66) | — | 138 | 414 |
| CD (P=0.05) | 0.33 | NS | NS | | | 54 |

Figures in parentheses are $\sqrt{x+0.5}$ transformed values

## RESULTS AND DISCUSSION

Trials conducted during September 1985 revealed that less incidence of leafhopper, *Amrasca biguttula biguttula* Ishida was recorded on cotton when intercropped with greengram, sunflower and blackgram. But contrary to this, less population of aphids was recorded on sole crop of cotton when compared to intercropping with greengram or blackgram. The population of whitefly was uniform both on pure crop as well as crop combinations (Table 1).

During September 1986, the leafhopper population per leaf on cotton was comparatively low when intercropped with sunflower (0.98), lablab (1.12), greengram (1.17) and blackgram (1.21). There was no significant difference on population of whitefly and aphid on cotton either as pure crop or when intercropped with pulses and sunflower.

The data on gross return in terms of rupees obtained in each crop combination as well as sole crops during 1985-86 indicated that cotton + greengram recorded the highest gross income of Rs.3,556 and Rs.3,553/ha during 1986 and 1987 respectively. But this crop combination was on par with raising cotton as sole crop during 1987. Considering the overall reduction in the population of aphid and leafhopper on cotton, this can intercropped with greengram. The superior effect of intercropping of cotton with greengram is in agreement with the findings of Rabindra (1985).

## REFERENCES

BHATNAGAR, V. S. and J. S. DAVIES 1978. Cropping Entomology Progress Report for 1977-78. ICRISAT, Hyderabad.

LITSINGER, J. A. and K. MOODY, 1976. Integrated Pest Management in multiple cropping systems. In Multiple Cropping (Eds.) R. I. Papendick, P. A. Sanchez and G. B. Triplett Spl. Pub. No. 27, American Society of Agronomy, Madison Nisconsin U. S. A. pp. 293-316.

RABINDRA, R. J. 1985. Transfer of plant protection technology in dry crops. In 'Proceedings of the National Seminar on Integroted Pest and Disease Management" (Ed. by S. Jayaraj), Tamil Nadu. Agric. Univ., Coimbatore pp 377-383.

VAN EMBDEN, H. F and G. WILLIAMS 1974 Insect stability and diversity in agro-ecosystem. *Ann. Rev. Entomol 19*: 455-475.