

SUMMARY

The following is the summary of this study :

1. The dry weight of corn varied among cropping patterns, N rates and also between years. During the **maha** season, 1989/90, corn + cowpea pattern had significantly greater dry weight of corn than other intercrops. During the **maha** season, 1990/91, corn dry weight did not vary among cropping patterns.

The corn dry weight was greater at 80 kg/ha of N in corn + mungbean intercrop, at 120 kg/ha of N in corn + soybean intercrop at 40 kg/ha of N in corn + cowpea and corn + blackgram intercrops during the **maha** season 1989/90. In the **maha** season, 1990/91, this response varied only in two intercrops: corn + soybean intercrop gave its significantly higher dry weight at 40 kg/ha N, whereas corn + blackgram intercrop gave a higher dry weight at 120 kg/ha N, when compared to other N rates.

2. Dry weight of legumes was affected by cropping pattern only during the **maha** season 1989/90, and by N rate during both years. The dry weight of legumes was at the 40 kg/ha N rate during the **maha** season, 1989/90, but varied during 1990/91. Intercropped mungbean, cowpea, soybean and blackgram gave the highest dry weight at 120, 40, 80, and 0 kg/ha N, respectively.
3. Grain yield of corn was unaffected by cropping pattern, but was lower than the sole crop. Corn yield increased significantly with increasing the N rate from 40 to 80 kg/ha in all intercrops during the **maha** season 1989/90. The response was similar even during the **maha** season, 1990/91, except corn + mungbean and corn + soybean intercrops. Both of these intercrops gave significantly greater corn yields only at 40 kg/ha N when compared to 0 kg/ha N.
4. During the **maha** season 1989/90, grain yield of mungbean, cowpea and blackgram in intercropping was significantly increased with increasing the N rate from 0 to 80 kg/ha, but decreased with further increase in the N rate from 80 to 120 kg/ha. Grain yield of intercropped soybean did not respond to 0 to 40 kg/ha increase in the N rate, but decreased with increasing the N rate from 40 to 120 kg/ha.

During the **maha** season, 1990/91, grain yield of mungbean remained unchanged, while cowpea and soybean increased significantly with increasing the N rate from 0 to 40 kg/ha, and blackgram with increasing the N rate from 80 to 120 kg/ha.

5. Land equivalent ratio (LER) was significantly increased by the N rate when increased from 40 to 80 kg/ha only during the **maha** season, 1989/90. LER was greater than 1 at N rates 80 kg/ha and above. During the **maha** season, 1990/91, the N rate of 40 kg/ha and above gave LER's above 1.
6. The ammonium-N in soil decreased with time after seeding during both seasons. Soon after top dressing, the ammonium-N in soil showed an increase, but decreased to the previous level within 16 days during the **maha** season, 1989/90. This response was not prominent during the **maha** season, 1990/91.
7. The nitrate-N in soil decreased sharply during the initial 16 to 32 days from seeding, then increased from 32 to 48 DAS and thereafter decreased. A slight increase occurred from 94 DAS onwards. Similar response was found during the **maha** season, 1990/91 too.
8. The total N in soil decreased until 48 to 68 DAS in the **maha** season, 1990/91 and 63 DAS in 1990/91. By the 79 DAS in both years, the total N in soil increased and then decreased towards the end of the cropping period. Increase in the total N in soil ranged from 8 to 15 mg/100g soil (180 to 337 kg/ha N) during the **maha** season, 1989/90, and 7 to 10 mg/100g soil (157 to 225 kg/ha N) during the **maha** season, 1990/91.
9. The output of N in corn grains ranged from 29-34 kg/ha during the **maha** season, 1989/90, and 31-38 kg/ha during the **maha** season, 1990/91. Increasing the N rate from 0 to 80 kg/ha during the both years increased the output of N in corn grains.

The N output in legume grains was increased with increasing the N rate from 0 to 40 kg/ha during both years, except in corn + blackgram intercrop in 1990/91: the N output increased with increasing the N rate from 80 to 120 kg/ha.

10. The total N output in stalks was not affected by the cropping pattern. There was a significant effect of N rate on the N output in the stalk of intercropped soybean and blackgram. Increasing the N rate from 0 to 40 kg/ha increased the total N output in the stalks of corn + soybean and corn + blackgram intercrops. The total N output in the stalk ranged from 70-80 kg/ha in corn + mungbean intercrop, 65-94 kg/ha in corn + cowpea intercrop, 65-97 kg/ha in corn + soybean intercrop, and 29-87 kg/ha in corn + blackgram intercrop, during the **maha** season, 1989/90. During the **maha** season, 1990/91, total N output in the stalks in intercropping was 51-79, 19-74, 27-54, and 34-69 kg/ha, for intercropping systems consisted of corn with mungbean, cowpea, soybean and blackgram, respectively. During the year 1990/91 stalk

N output decreased when compared to the previous year, 1989/90. These N rates are added to the soil when stalks of corn and respective legumes are added to the same field.

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