6. SUMMARY AND CONCLUSION

The present investigation entitled "Studies on integrated nitrogen management in irrigated maize-mungbean intercropping system" was conducted during kharif 2003 and kharif 2004 at Amar Singh (P.G.) College, Lakhaoti, Bulandshahr, U.P. The treatments planting pattern viz. sole maize, maize + one row mungbean, maize + two row mungbean and sole mungbean and six nitrogen levels i.e. control, 60 kg N/ha, 60 kg N/ha + biofertilizer (Rhizobium + Azospirillum + PSB), 120 kg N/ha, 120 kg N/ha + biofertilizer (Rhizobium + Azospirillum + PSB) and Biofertilizer (Rhizobium + Azospirillum + PSB) were laid out in split plot design with the following objectives:

1. To find out the suitable row arrangement for maize-mungbean intercropping system.

2. To study the effect of legumes inclusion as intercrop with cereals on nitrogen economy of the system.

3. To study the effect of various N management practices on productively and sustainability of the system.

4. To investigate the economic feasibility of various treatment.
6.1 INTERCROPPING SYSTEM

1. Growth parameters of maize viz., plant height and dry matter production recorded significantly higher values in maize + two row of mungbean as compared to sole maize but on par with maize + one row of mungbean. Whereas, the mean value of plant height and dry matter production of mungbean were higher in maize + two row of mungbean.

2. Yield attributes in maize viz., number of cobs per plant, length of cob, number of grains, grain weight per cob and weight of cobs were significantly improved in maize + two row of mungbean over sole maize but on par with maize + one row of mungbean. The yield attributes of both the crops were higher in maize + one row of mungbean than maize + one row of mungbean intercropping system.

3. Maize + two row of mungbean recorded a significantly higher grain yield i.e. 39.09 and 41.18, stover 65.76 and 68.4 and biological yield in comparison to sole maize. However, yield response of maize + two row of mungbean was on par with that of maize + one row of mungbean. The harvest index of maize was superior in maize + one row of mungbean but not improved significantly due to intercropping.

4. NPK in grain and stover were enhanced in maize + two row of mungbean but not significantly over rest of the cropping system, whereas nutrient (NPK) uptake were significantly enhanced in
maize + two row of mungbean over sole maize. NPK uptake non-
super in maize + tow row of mungbean and maize + two row 
of mungbean.

5. Maize equivalent yield were found significantly higher in maize 
+ two row of mungbean i.e. 34.94 per cent (49.06 q/ha) higher 
over sole maize (36.36 q/ha).

6. Land equivalent ratio (LER) was higher (1.67) in maize + two 
row planting pattern in both the years.

7. The competition functions relative crowding coefficient, competition 
ratio and aggressivity were dominant and more competitive and 
mungbean was less competitive.

8. The highest net return and B:C ratio were recorded in maize + 
two rows of mungbean whereas sole crop recorded minimum net 
return in this system.

6.2 NUTRIENT MANAGEMENT

1. Growth parameters viz., plant height and dry matter production 
were highest with 120 kg N + biofertilizer but plant height and 
dry matter production was not significant at 30 DAS, whereas 
at the rest of growth stages (60,90 DAS and at harvest) in maize, 
these parameters increased significantly up to the application of 
120 kg N ha\(^{-1}\). As per mean values of plant height and dry matter 
production in mungbean, these parameters found highest with the 
application of 120 kg + biofertilizer.
2. Almost all the yield attributes of maize were significantly improved by the application of 120 kg N ha\(^{-1}\) over their lower levels. In mungbean number of pods per plant and number of grains per pod were improved up to 120 kg N ha\(^{-1}\).

3. Similarly 120 kg N ha\(^{-1}\) enhanced grain, stover and biological yield significantly over rest of lower levels in maize whereas harvest index increased significantly up to 60 kg N ha\(^{-1}\). In mungbean as per mean values grain and stover yield were found highest with 120 kg N + biofertilizer. The extent of increment in grain yield was about 26.60 and 41.73 per cent in maize over control with 60 and 120 kg N ha\(^{-1}\), respectively.

4. Contents of NPK and their uptake by grain and stover and the total nutrient uptake showed a significant improvement by 120 kg N/ha.

5. Maize equivalent yield was highest with the application of 120 kg N + biofertilizer i.e. 44.77 per cent increase over control.

6.3 **SOIL FERTILITY STUDIES**

Available nitrogen was higher in maize + two row of mungbean cropping system and with respect to nitrogen, available nitrogen were highest at the level of 120 kg N + biofertilizer.

6.4 **ECONOMICS**

The maximum net return was obtained due to maize + two row of mungbean in combination with 120 kg N + biofertilizer.