



## EFFECT OF INTERCROPPING ON YIELD OF MAIZE HYBRIDS WITH MUNGBEAN (Review)

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### ABSTRACT:

Maize (*Zea mays* L.) occupied the third place mainly cereal/ fodder produce in the world. Maize gained a chief place in the many cropping pattern of Pakistan. Intercropping is economically beneficial and favorable for the fertility restoration of land. Intercropping of maize with mungbean increased water use efficiency, light use efficiency as well as nutrient use efficiency which positively affect the different yield as well as agronomic parameters like plant height, number of grain row per cob, cobs length, cob girth, thousand grain weight, total dry matter and seed yield which ultimately increases the final yield.

### INTRODUCTION

Maize and others pulses crops are too much value able less period summer legumes like as mungbean, cowpea, pigeonpea, and ricebean are they provide additional financial output to the farmers. (Iqbal *et al.*, [1]; Ahmad *et al.*, [2]. Khan and Khaliq [3] was studied the results of various legumes and non leguminous mix-cropping scheme on which cotton was grown in two planting methods all intercropping techniques gives mostly low yield when planted in combination by cotton in either planting patterns compared to their sole crop yield. Akman and Sencar [4] reported that maize was intercropped with beans or cowpea and highest maize grain yield were obtained with alternate rows of maize and cowpea or beans. The number of pods of beans and cowpea were negatively affected by intercropping expect for mixed cropping of equal number of maize and beans plants with highest yields in mono crops. Sharma and Choudary [5] studied that intercropping with mungbean plus soybean did not decrease the total yield of maize. Sole maize and when maize + intercropped crop than yield increased normally with equal to dose of 120 kg N ha<sup>-1</sup>. The increased in maize yield with intercropping compared with mono cropping was higher at minor dose of nitrogen appliance.

Oljaca *et al.*, [6] carried out his experiment in order to evaluate that the best traditional planting way of corn and beans crops intercropping practice in irrigated areas as the same way in dry land agricultural system. Planting model of intercropping system has do not considerably influence leaf area index on maize whereas, the intercropping scheme have a higher effect on parameters of yield of maize. Santalla *et al.*, [7] noticed the effects of intercropping bushbean with maize on various agronomic parameters and observed that population mean differ little between cropping systems. Important differences among populations were found for all characters expect end of flowering and pod yield. Arshad [8] evaluated the biologically-return efficacy of numerous maize dependent intercropping schemes at various planting models and resulted that planting arrangement does not have considerable effect on height level of plant, plant population, no of grain ear<sup>-1</sup> as well ear plant<sup>-1</sup> of maize. Remaining of nitrogen that are left in soil are enhanced by the growing of legumes intercropping practices as compare with sole crop cotton in addition to non leguminous intercropping system and same way organic matter was also superior in all intercropping treatments and maximum increase was recorded due to cowpeas. Phosphorus was exhausted in all intercropping systems. (Shen and Chu [9] resulted that pulses are able to fix the nitrogen through their root nodules and then this nitrogen is transfers by these legumes to the cereals crops which are growing with these. This nitrogen is beneficial resource for cereals. According to Viljoen&Allemann [10] benefits of intercropping consist of: higher yield as compare to sole crop yields, mostly because of less intra-specific competitiveness ability, maximum level of crop yield stand, well use of natural resources, good management for weed control, application of high protection regarding damage of crop, improve value by varieties in addition to corn also need as a sole crop demand a large locality in order to give equal production as maize do in intercropping system. Trenbath [11] studied that when species are grown as a sole crop they attract more insect/pest and diseases while intercropping show less damage as compare to sole cropping. Caldwell [12] described that significant mix crop population in intercrop covers is only achievable its depends upon number of factors like combination in planting space, sowing date special arrangement for plants, leaf shape and its size, orientation of leaf and depend on height of the plant. Plant top uniqueness with component crops are not stable however it may vary due to the presence of other species. Seedling germination, their emergence and further growth of plants are yield factor of mungbean in closeness with maize were reduced to greater level than that in cassava intercrop (Sangakkara, 2006) [13]. (Ghosh *et al.*, [14] investigated that in cereal-legume intercropping system, the mixture of maize + pigeonpea was calculated to be extremely important because of least demand for nutrients, on the other hand in legume+ legume mix-cropping scheme pigeonpea+ groundnut pattern were the mainly well-organized by means of source based effectiveness. Rana *et al.*, [15] carried out his experiment and investigated that stature of plant moreover leaf area index (LAI) of corn crop is mostly maximum in legumes-maize based intercropping systems compare to sole maize. In the same way 100% NPK fertilization application produced significantly



higher leaf area index. Grain yield in of maize in intercropping system was higher than maize planted as sole. Ahmad [16] Studied on bio-financially viable efficacy of mungbean with sunflower intercropping and resulted to facilitate the planting density and oil substance from the sunflower through achene was not affected notably by different patterns of intercropping where as planting height, amount of leaves plant<sup>-1</sup> and the leaf area index were influenced significantly. Rashid *et al.*, [17] reported the viability of inter-cropped legumes with sorghum and discussed that intercropping of legumes effect on plant height as well grain yield of sorghum crop on the same way the leaf area index of intercropped sorghum is lower than the alone growing of sorghum this leaf area index will be more less in case of intercropping of sorghum with cluster beans. Adu-Gyamfi *et al.*, [18] studied that intercropped legumes fix the atmospheric nitrogen from the atmosphere when no nitrogen fertilizer are available. Intercropping is beneficial because of number of aspects such as it increase light interception, root contact more with soil increase microbial activity and can act as a resistant to insect pest as well as diseases. Ferguson and Rathinasabathi [19] studied that different plant parts produced different allelopathic chemicals their activities varies over a growing season and take account of flora, leaves, leaf debris, leaf mulch, stem, shoot, root, soil, and soil lactates and their other components. Behairy [20] intercropped soybean with maize in 2:2 or 4:2 row ratio or soybean were grown sole. The chlorophyll substances of intercropped soybean were considerably decreased as compared to the soybean grown sole. Plant height was increased and dry weight of stems, leaves, pods, and leaf area was reduced in intercropping treatments compared with soybean grown as sole. Azim *et al.*, [21] examined the result of maize and cowpea intercropping on the basis of biological yield production and silage character. Maize was grown alone and intercrop with cowpea with seed ratio of 85:15 and 70:30. The data showed that a major increase in biomass and crude protein making of fodder in which maize and cowpea be intercropped at seed ratio of 70:30 pursue by a seed ratio of 85:15, as evaluate with sole maize. Intercropping minimize the risk of failure of the base crop and also increase the food supply to ever increasing population without reducing the sustainability of soil, also maximize production by keeping full plant population ( Prasad and Brook, 2005)[22]. Intercropping enhances resource use efficiency, it improve the water use efficiency, land use efficiency as well as fertilizer and water. Intercrop pings help in maintaining fertility of soil (patra *et al.*, 1986)[23] and efficient use of nutrients (Nazir *et al.*, 1997)[24]. Planting pattern is the important cultural practice that determined the grain yield as well as other agronomic parameter such as plant architecture influences on growth production and distribution of carbohydrates (Casal 1985)[25]. Planting pattern improves the yield by efficient nutrient uptake and by shading effect. Maximum plant population can be obtained by maintaining planting patterns (Nawab *et al.*, 1999)[26]. Intercropping not only increase the yield but also make symbiotic N association with legumes bacteria of genera *Rhizobium* and *Bradyrhizobium* gives the most important organic source with fixing nitrogen compound in agricultural soils (Brady and well 1996)[27]. Maximum yield through mix-cropping with respect to alone cropping are commonly recognized to share kind results to component crop, such as better entirety amount of obtainable possessions. Mostly, monoculture legume gives large amount of yields compare to an inter-cropping practice. On the other hand, on many times soil fertility, calculated by Land equivalent ratios, obviously gives the benefits of inter-cropping of cereal and legume (Yunusa, 1989)[28] and Manda *et al.*, 1990)[29]. Rahim *et al.*, (2004)[30], compared the three different ratios of intercropping of maize and soybean with their mono cropping and reported that the maximum yield are related to the treatment of 50% intercropping of equally crops and then 25 % corn and 75 % soybean and also observed that reducing the number of corn rows, length of ear, number of ear in each plant, Kernel number per year, soybean pod number, 1000 weight of grain soybean and crude percent protein of soybean enlarged, perhaps as a result of less shading and dominance of corn.

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