# Selection of maize varieties under maize based inter cropping condition in Nepal

# Author(s) name: Govind K.C.\*, D.B. Gurung, B.B. Pokharel

Nepal Agricultural Research Council (NARC), National Maize Research Programme (NMRP), Rampur, Chitwan, Nepal \*Present address: CIMMYT- South Asia Regional Office, Kathmandu, Nepal \*Author for correspondence: kc.govindkc@gmail.com

### Abstract

A field experiment was conducted in winter season, 2008 at NMRP Rampur, Chitwan (228 masl) and in summer, 2009 at GRP Kapurkot Salyan (1480 masl) to evaluate the different 12 maize cultivars under intercropping practices with various intercrops so that the best fitted maize varieties in intercropping condition could be identified for the predominant practices of maize in mid hills of Nepal. The maize yield obtained in the study was significantly varied as per varietal yield potential. Intercrop yield obtained under different maize cultivars was significantly differ and six cultivars including Pool 17 (1016 kg<sup>-ha</sup>), Shitala (1009 kg<sup>-ha</sup>), Arun 4 (992 kg<sup>-ha</sup>) yielded significantly higher intercrop yield. The cultivars Shitala, Manakamana 4, Acc9944 X Acc9942 and Deuti were found superior in yielding both good intercrop yield (1009, 904, 941, 933 kg<sup>-ha</sup>) as well as significant higher MGEY (7233, 7332, 7022, 6867 kg<sup>-ha</sup>) and hence found to be well fitted to intercropping practices in both winter and summer seasons in Nepal.

# Introduction

Maize (Zea mays L.) is the second most important cereal grains in Nepal and priority staple food crop in the hills, contributing 43.5% of total edible food production. It is cultivated in a wide range of agro-climatic conditions concentrating the 70.4% of area in mid hills under rainfed condition where intercropping practices is predominant, primitive, traditional and existed mainly for subsistence. Maize best fits to intercropping practice due to its physiological nature and the selection of the best fitted varieties of maize in intercropping practices for maximum profitable return was the objective of the study.





## **Materials and Methods**

The experiment was carried out at NMRP Chitwan (228 masl) in winter, 2008 and at ARS Salyan (1480 masl) in summer, 2009 and laid out in RCB design to evaluate the 12 different maize varieties under intercropping practices with soybean (Salyan) and Kidney bean (Chitwan). Maize was planted in end of September in Chitwan and early June in Salyan maintaining 100 cm row spacing and inter crops were planted in between the two rows of maize.

#### **Results and Discussion**

The maize yield obtained was significantly varied as per varietal yield potentiality. Different maize cultivars also resulted significant difference in intercrop yield, six cultivars including Pool 17 (1016 kg/ha), Shitala (1009 kg -ha), Arun 4 (992 kg -ha) yielded higher and comparable intercrop yield. Strong negative relationship between maize plant heights/leaves per plant and intercrop yield was observed under intercropping condition (Table 2) and shading effect of full season varieties on intercrops has been seen.

Due to variation in yield potential of different intercrops and market price the evaluation of their profitability besides biological yield in making a valid inference would be one of the ways in intercropping study. Hence, maize grain equivalent yield (MGEY) is calculated and evaluated. Early maturing cultivars (Arun 2, Arun 4, Pool 17 and Arun 1 EV) yielded significantly lower MGEY (5257-6000 kg <sup>-ha</sup>). The highest maize yielding cultivars Manakamana 4, Shitala, Acc 9944 x Acc9922 and Deuti yielded also the higher MGEY (6867-7332 kg/ha).

Maize Cultivars	Maize GY kg <sup>-ha</sup>	Inter crop GY	Maize
		kg <sup>-na</sup>	GEY kg <sup>-ma</sup>
L. Location 1. Kapurkot	3858	971	5508
2. Rampur	4936	765	7232
V. Maize Variety 1. Manakaman 4	5253	904	7332
2. Shitala	4992	1009	7233
3. Acc 9944X Acc 9942	5078	841	7022
4. Deuti	4730	933	6867
5. Posilo makai	4832	709	6471
6. Manakamana 3	4557	817	6354
7. Rampur Composite	4770	705	6346
8. S99TLYQ-B	4250	936	6304
9. Arun 4	3808	992	6000
<b>10. Arun 1-EV</b>	3881	823	5767
11. Pool 17	3040	1016	5296
12. Arun 2	3573	733	5257
CV %	18.63	22.37	15.82
SEMD Location (L)	225.1**	83.9	313.5**
Variety (V)	472.9**	112.1*	580.3**

Table 2: Correlations between maize traits and intercrop yield and traitsfound in maize based inter cropping trial, 2008 and 2009.

Maize Traits	]	Maize			
	Branch	Plant	Pods/plant	Grain	grain
	/plant	height		yield	yield
Plant popn	-0.276	-0.133	-0.797**	-0.238	0.511
Plant height	-0.254	-0.254	-0.442	-0.619*	0.796**
Leaves/plant	-0.333	-0.271	-0.627*	-0.594*	0.703**
Maturity	-0.057	-0.238	-0.511	-0.262	0.847**
days					

#### Conclusions

Among evaluated, newly released and promising maize cultivars Manakamana 4, Shitala, Acc 9944x Acc9922 and Deuti were found superior in yielding both satisfactory intercrop yield (904, 1009, 841, 933 kg -ha) as well as higher MGEY (7332, 7233, 7022, 6867 kg -ha) and hence found to be well fitted to intercropping practices in Nepal.



	LV	668.7	158.5	820.7	
LSD (P=0.05)	V	1041.0	246.8	1277.0	
*, **, ns : signification	nt slope at P<0.05,	P<0.01, P>0.05.			

#### References

Bharati M.P, H.B. Shresth and K.M. Sing. 1977. Proceeding, NMDP Rampur, Jan 4-10, 1977.
Chatterjee B.N. and B.K. Mandal. 1992. Indian Journal of Agricultural sciences 62(8).
Joshi M.2007. Multiple cropping systems. July 2007.
Neupane R.K., R. Shrestha, E.M. Bhattarai, R. Darai.2002. Development of production technology of common beans to the hills of mid-western Nepal. Review of literature. NARC/NGLRP Chitwan.
Shiblee S.M.A., A.F.M.F. Rahman, M. Kamruzzaman P.C. Sarkar, A. Muqit, and M.A.A. Begum . 2000. Pakistan Journal of Biological Sciences. Volume: 3 - Issue: 9