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ویب سایت: Www.aria.gov.af
ایمل ادرس: aria@mail.gov.af
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Introduction of Four open pollinated maize (*Zea mays L.*) varieties To Afghanistan

Qudratullah Soofizada[1], Habiburahman Ayoubi [2] , Abdul Manan Amiri[3], Shakeb Attayi[4] , Elias Momond [5], Eng. Qayoom[6] , and M Hashim azmatyar [7]
Crop Improvement Department, Adaptive Research Directorate. Agricultural Research Institute of Afghanistan, Badam Bagh, Kabul-Afghanistan

ABSTRACT

The present investigation was conducted to examine 30 new mazes open pollinated (OPV) varieties introduced by CIMMYT. The genotypes were included in advanced experimental units of "EPOP-14" are used different genotypes of Maize. the experiment was tested in experiment of PYT, AYT and NUT at Research station of Darulaman(Kabul), Shishambagh (Nengrahar) and Bolan (Helmand) during seasonal crop growing from 2014 to 2015. Three genotypes #11, 22 and 24 were identified wide adapted and they show best yielding performance in different agro-climatic condition of Afghanistan. Therefore, these maize genotypes were selected for release for cultivation in the country.

Key Words: Maize (*Zea mays L.)*, grain yield, (OPV), varieties

INTRODUCTION

Maize (*Zea mays* L.) is the third most important food crop of the world, after wheat and rice, providing 15% of the protein, and19% of the calories for the developing countries (Shakoor *et al*, 2007) and an important cereal crop that provides staple food to large number of human population in the world. Besides being a rich source of starch (80%), maize seed also contains proteins (10%), oil (4.5%), fiber (3.5%) and minerals (2%) (Reddy and Reddy, 2003). The production and utilization potential of maize in the recent years is not only attracting the attention of research scientists but also evolving major national and international thrust with a view to providing solution to various problems of maize which include low seed yield (Kim, 1994). Maize is produced

for human consumption also in developing country. In developed countries, maize is used for making oil, alcohol, starch, juice and sugar (Obaidi *et al*, 2012). It is the highest yielding grain crop having multiple uses and one of the most important cereal crops and occupies prominent position in global agriculture after wheat and rice (Seshu *et al*, 2014). Maize is currently produced on nearly 100 million heaters in 125 developing countries and is among the three most widely grown crop in 75 of these countries. Total maize cultivated area in the world is 177.37 million hectares (FAO, 2013-2014). Maize is the third most important cereal crop in Afghanistan grown throughout the country and in different ecological zones. In Afghanistan production of maize in 2015 was 300,000 tons from a cultivated area 0f 141,000 ha with productivity 0f 2 tons/ha (FAOSTAT, 2015-2016).

MATERIALS AND METHODS

The experiment EPOP#4 included 30 genotypes of OPV Maize variety in RCBD with three replications. Each genotypes planted in four rows of 2m long with 0.7 m space between rows and 0.2m plant to plant. The study was conducted in Darulaman, Shishambagh and Bolan Research station of Kabul, Nangarhar and Helamd provinces respectively. The crop growing season was different for each location, started at the first week of May in Kabul to July in seasonal maize growing at Nengarhar and Helmand. Field management, irrigation and application were practiced the same at all the locations. Fertilizer DAP AND Urea Were used as 200 and 300 kg/ha.

RESULTS AND DISCUSSION

The analysis of variance in Preliminary Yield Trial of 30 maize (OPV) varieties with zudras as check at Shishambagh Research Station (Nengrahar) shows genotype (EPOP-14#11) had 47 % higher yield compare to check, The average yield of EP0P-1424, EPOP-14#22, & EPOP-14#26) was higher 21-47 % than check respectively in 2014. The advance trial with 30 lines and check zudras was again tested at Shishambagh Research Station (Nengrahar), the proposed genotypes had the best performance compare to check in 2015. The final year 15 National Uniformity Trial

(NUT) done at three different locations of Bolan Research Station (Helmand), Darulaman Research Station (Kabul) and Shishambagh Research Station (Nengrahar). The mean yield of three years, three locations of the proposed varieties shows higher yield performance compare to check in Afghanistan's three different climatic zones ranged from 26-35%.

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CONCLUSION

It is concluded that the overall mean yield across three years indicated that genotypes EPOP-14#11, EP0P-14#24, EPOP-14#22 &EPOP-14#26) were found superior in terms of yield production ranged from 24-55% higher against various checks used during the testing period (Table 1), Even though, they were higher yielder but they matured similar to the check varieties (Table 2). Similarly, other traits like cob length, plant height and number of rows per cob were comparable to checks and will thus facilitate immediate adoption by farmers. Therefore, these lines are proposed for release for commercial cultivation to help farmers harvest higher yields per unit area compared to any other variety available in the country.

Table (1) Average of the released verities in different locations between 2014-2016

SN	Pedigree	Name	Average yield kg/ ha
1	CZP132004	Aryana-97	8811
2	ZM521	CIMMYT-97	8462
3	ZM309	Badam Bagh-97	8220
4	SC513	Bolan-97	8126
5	Local Check	(Zodras)	6077.333
6	Local check	(Shamal- 08)	6393
7	Local Check	(Sharq- 08)	6545.333

(Table 1) shows genotype (CZP132004) with production of 8.9 ton/ha stand in first position in term of yield compare to checks and genotypes (ZM521), ZM309 and (SC513) stand in second, third and fourth respectively.

Figure 1 – Average of maize released verities against local checks

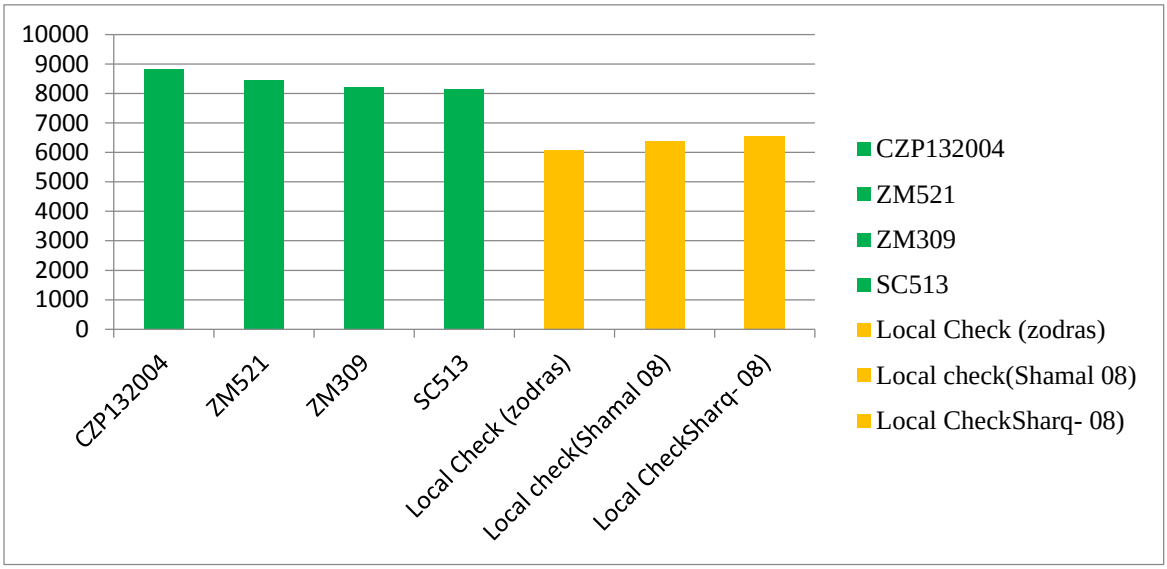

Table 2. Mean of agronomic triats in testing periods (2014-2016)

NO	**Pedigree**	Days to tassel	Days to Silk	Days to Maturity	Plant Height (cm)	Ear Height (cm)	Cob Length (cm)	No of rows per cob	No of grains per COB	Yield cob (gr)	TKW (gr)	Bundle Wieght(kg)
1	CZP132004	**57**	63	120	207	113	17	15	494	149	334	37150
2	ZM521	59	64	117	229	130	16	14	483	140	337	35359
3	SC513	62	66	119	230	128	16	15	505	137	344	38191
4	ZM309	59	63	120	222	138	16	14	475	136	309	35311
5	Local Check (Zodras)	58	62	119	215	123	16	14	477	118	302	23565
6	Local Check (Shamal 08)	66	72	121	200	122	16	14	449	115	314	29755
7	Local Check (Sharq- 08)	64	70	120	199	123	16	15	455	134	321	29705

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