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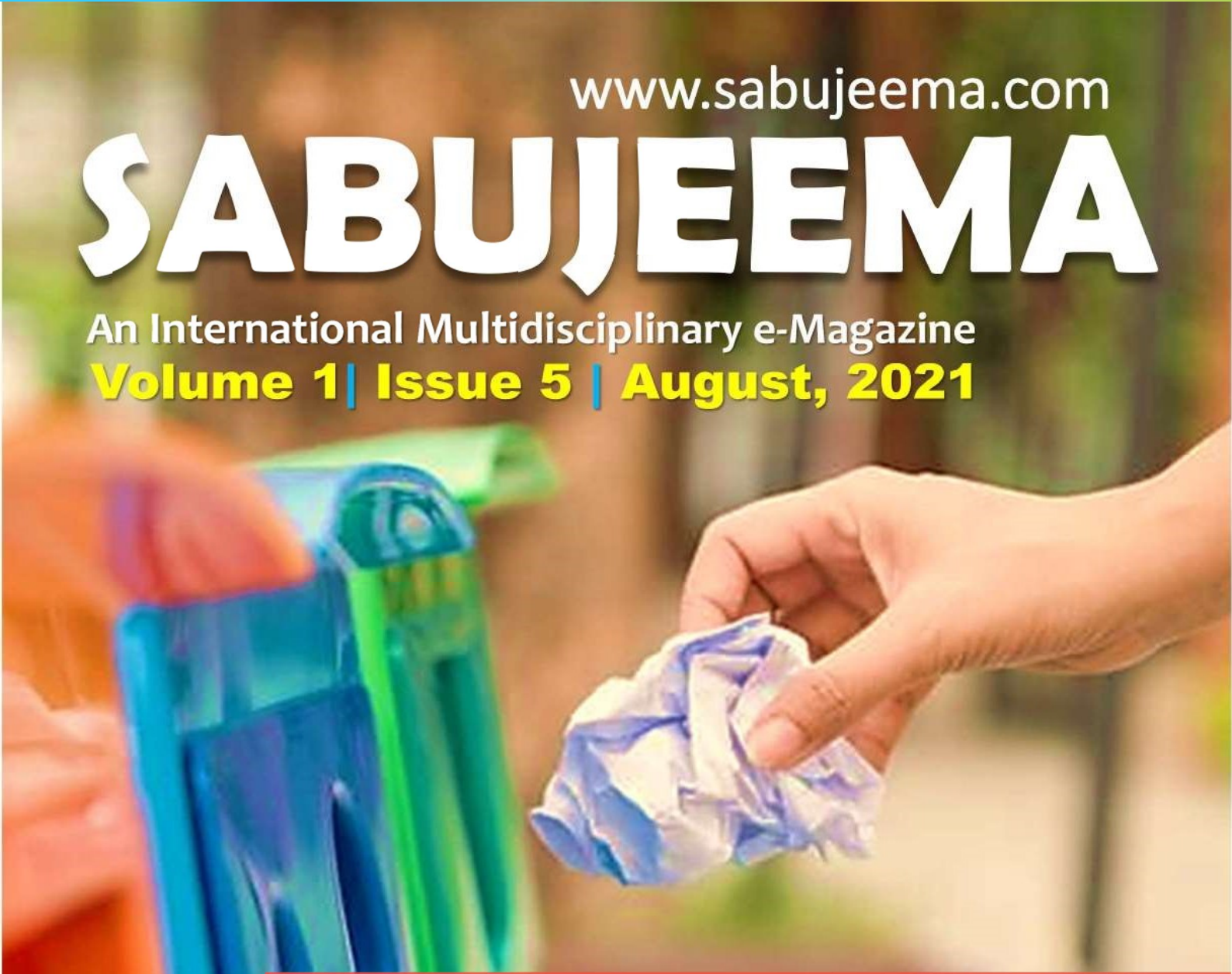

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FIRST REPORT OF DEMONSTRATIONS ON MAIZE HYBRID IN BUNDELKHAND

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ABSTRACT

Six maize hybrids namely; DHM-117, DHM-121, CP-333, CP-555, CP-585 & CP-999 were demonstrated in 1.5 hectare area of C-13, C-14, D-21 & D-22 blocks at Research Farm of Rani Lakshmi Bai Central Agricultural University, Jhansi during kharif-2020. All the hybrids were showed good morphological performance as well as have good yield potential under Bundelkhand region. The average yield of hybrids were recorded 14-16 q/acre with minimum utilization of the resources like fertilizers, irrigation, herbicide and pesticide applications, etc.

INTRODUCTION

Maize is the most widely distributed crops of the world. It is cultivated in tropics, sub-tropics and temperate regions unto 500 and from sea level to 4000 m. Al under irrigated to Semi-arid conditions. Tremendous choice is available as regards to varieties maturing in 85 days to more than 200 days with variability in grain colour and texture etc. Maize is an important cereal in many developed and developing countries of the world. It is widely used for animal feed and industrial raw material in the developed countries where as the developing countries use it in general for feed. In Indian Agriculture, Maize occupies a prominent position and each part of the maize plant is put to one or the other use and nothing goes as waste. Among the cereal crops in India, maize with annual production of around 10 million tones covering 6 million hectares ranks fifth in area being next to rice, wheat, jower and bajra, fourth n production whereas in productivity it ranks at third position. Maize production in country is fully utilized domestically for food and exports are negligible. Even with the spectacular increase during the recent years in production of the finer cereals i.e., rice, wheat or also of jowar coarse grain, there is no problem of surplus of maize. It is, therefore, inferred that, with the increasing demand for, food grains relative population growth maize will hold its share as an important cereal food grain.

NUTRITIONAL QUALITY

Maize or corn (Zea mays L.) is an important cereal crop of the world. It is a source of nutrition as well as phytochemical compounds. Phytochemicals play an important role in preventing chronic diseases. It contains various major phytochemicals such as carotenoids, phenolic compounds, and phytosterols. Nutritionally, maize contains 60 to 68% starch and 7to 15% protein. Opaque seeded types are more nutrition's and contains a high percentage of essential amino acids. The embryo which forms about 12% of the whole grain is the source of protein, fats and sugars. Yellow maize is the richest sources of Vitamin-A.

Maize has more riboflavin than wheat or rice and is rich in phosphorous and potash. Maize contains 1.2 to 5.7 % edible oil. Varieties developed particularly for oil production contain as much as 14%. Maize oil is widely used as a cooking medium and for manufacturing of hydrogenated oil. The oil has the quality of reducing cholesterol in the human blood like sunflower oil. The fat content of the oil is about 80%. Maize acts as a source in the manufacture of starch, syrup, dextrose, oil, gelatin, lactic acid tec. Corn flour is used as a thickening agent in the preparation of many edibles like soups, sauces and custard powder. Corn syrup is used as an agent in confectionary units. Corn sugar (dextrose) is used in pharmaceutical formulations is s sweetening agent in soft drinks etc. corn gel on account of its moisture retention character is used as a bonding agent for ice-cream cones, as a dry Dustin agent for baking products. The next important field where maize finds extensive use is for livestock feeds viz, cattle Poultry and piggery both in the form of seeds and fodder. The green fodder can be fed to milch cattle to boost the milk production of a considerable extent; "South African Maize" is a best suited variety for fodder. The crop has to be harvested when the grains are in milky stage, This variety is supposed to have Lactogenic effect hence specially suited for milch cattle. The digest ability of maize fodder is higher than sorghum, bajra and other non-leguminous forage crops. Maize plant does not have any problem of hydrogenic acid or prussic acid production, hence of necessary crop can be harvested and fed to cattle at any stage of its growth, of course ideal stage of harvest for green fodder mid dough stage, when the dry matter content and digestibility are more desirable. The high carotene content of yellow maize is considered to be very useful in importing yellow colour to egg yok and yellow tinge to the milk. No other concentrate is yet to known to substitute maize in this respect.

Forage and feed uses: The next important field where maize finds extensive use is for livestock feeds viz, cattle Poultry and piggery both in the form of seeds and fodder. The green fodder can be fed to milch cattle to boost the milk production of a considerable extent; "South African Maize" is a best suited variety for fodder. The crop has to be harvested when the grains are in milky stage, This variety is supposed to have Lactogenic effect hence specially suited for milch cattle. The digest ability of maize fodder is higher than sorghum, bajra and other non-leguminous forage crops. Maize plant does not have any problem of hydrogenic acid or prussic acid production, hence of necessary crop can be harvested and fed to cattle at any stage of its growth, of course ideal stage of harvest for green fodder mid dough stage, when the dry matter content and digestibility are more desirable. The high carotene content of yellow maize is considered to be very useful in importing yellow colour to egg yok and yellow tinge to the milk. No other concentrate is yet to known to substitute maize in this respect.

FOOD USES

In most of the developing countries maize is consumed directly as food. In India, over 85 percent of the maize production is used as food. Most commonly used forms are as (1) Chapattis (2) porridges of various forms (iii) boiled or roasted green ears (iv) breakfast foods like corn flakes and (v) Pop corn. For the (iii) and (v) category sweet and Pop corn varieties are especially grown in USA and Europe.

Other Uses: The maize cob, the central rachis to which the grains are attached remains as an agricultural waste after threshing; it finds many important agricultural and industrial uses. Approximately it forms 15 to 18% of the total ear weight and contains 35% cellulose, 40% pentose and 15% lignin's. Their uses in agriculture includes as a litter for poultry and as a soil conditioner.

INDUSTRIAL USES

The industrial uses based on the physical properties of the cob when ground to powder are as fillers for explosives in the manufacture of plastics, glues, adhesives, rayon, resin, vinegar and artificial leather and as diluents and carrier in the formulation of insecticides and pesticides. Based on the chemical properties the processed cobs find their use in the manufacture of furfural, fermentable sugars, solvents, liquid fuels, charcoal gas and other chemicals by destructive distillation, and also in the manufacture of pulp, paper and hard boards. The water in which in which the maize grains are soaked for the manufacture of glucose is used for growing penicillin moulds.

ECONOMICS

The economics of cultivation of maize, jowar and wheat are almost the same: but the cost benefit ratio in case of maize is highest because of its high productivity. For processing of maize and its products mini factories should be setup around maize growing-areas of our country. This will enhance the demand for maize and its products and the growers can be directed their produce directly to the factories.

RESOURCES & METHODOLOGY

The improved technologies include improved varieties viz. DHM-117 and DMH-121, recommended dose of fertilizer and plant protection chemicals were applied for better morphological as well as for getting maximum yield. Crop was sown after receiving sufficient rainfall, between second week of June to last week of July will crop geometry of 40-60 x 20-25 cm and seed rate of 4 kg/acre. The total amount of phosphorus and potassium was applied as basal dose along with half dose of nitrogen and remaining dose of nitrogen was top dressed in two equal splits at 30 and 60 days after sowing. Hand weeding was done once at 20-30 days after sowing. The details of hybrids, block, date of sowing, seed quantity to be used and recommended plant population spacing are given below:

Table-1: Details of the maize demonstration at RLBCAU farm:

S. No.	Hybrids	Block	Date of sowing	Seed quantity	Spacing
1.	CP-999	C13	30/06/2020	1 KG	40 x 20 cm
2.	CP-858	C13	29/06/2020	4 KG	60 x 25 cm
3.	CP-555	C14	29/06/2020	4 KG	60 x 25 cm
4.	CP-333	D21	29/06/2020	4 KG	60 x 25 cm
5.	CP-333	D22	29/06/2020	4 KG	60 x 25 cm

Table-2: Details of the maize demonstration at Noner, Datia farm:

S. No.	Variety	Block	Date of sowing	Seed quantity	Spacing
1.	DHM-121	A-33	17/07/2020	4 KG	40 x 20 cm
2.	DHM-121	A-43	18/07/2020	4 KG	60 x 25 cm
3.	DHM-121	B-21	19/07/2020	4 KG	60 x 25 cm

Table-3: Layout of C-13 & C-14 blocks:

C-14 (CP-555)	
40 cm	
C-13 (CP-999)	C-13 (CP-585)
60 cm	60 cm

Table-4: Layout of D-21 & D-22 blocks:

D-21	D-22
60 cm	60 cm
Maize enrty trials	

RESULTS OF THE DEMONSTRATIONS

Approximately more than 14-16 quintal/acre yield has been recorded from the hybrid fields. Crop were protected from birds, parrots & other wild animals through using different types of sounds, like clapping, fire cracks and other instruments. A good crop were harvested with a good number of cobs per plant (2-3 cobs/plant), number of grains row per cob (450-600 grains/cob), number of grains per row (18-25), etc. with minimum utilization of the resources.

CONCLUSION & FUTURE PROSPECTS

The results were concluded that these maize hybrid are well adapted for Bundelkhand region in term of yield, maturity & diseases-pest infestation. So, Bundelkhand farmers can be grow these hybrids at your field and get the maximum yield with minimum utilization of resources and uplifting their socio-economic conditions & also doubling the their income.

Fig.-1: Pictures of crop stand, green cobs, cob lots and threshing of the cobs.