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EVALUATION ON MORPHOLOGICAL CHARACTERS AND YIELD CHARACTERS OF CHINESE WHEAT AND ZALOTE 2 WHEAT LINE

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ABSTRACT

In this paper, the local hexaploid wheat cultivar *Triticum aestivum* L. cv Zalote 2 and Chinese wheat cultivar collected from Zalote agricultural research farm in Monywa, Sagaing Region were compared and studied. Occurrence of tillers per plant, length of spike, spike density, spikelet per spike, number of seeds per spikelet and number of seeds per spike of hexaploid wheat Zalote 2 were significantly superior than the Chinese wheat. Although the above mentioned six characters of the plants were significantly different, four characters of the number of florets per spikelet, fertility of first and second florets, 100 seeds weight (micro-test weight) and individual seed weight were not much different from another plants.

INTRODUCTION

Human beings will have to face an unprecedented challenge in the next century, they need to be more than double of the world's food supply due to the rising population and the increasing income. Bread wheat *(Triticum asetivum* L.*)* is cultivated under various agroclimatic situations. The diverse genotypes in winter and spring wheat ecotypes cultivated in different regions are very low yielded and easily affected by the rusts and powdery mildew.

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Many scientists around the world have already reported the effect of chemical composition, deficiency in nutrient , soil texture on both vegetative and yield characters of different kinds of plants from different point of view in order to improve the plant characters. Hsan (1990) also stated that the transformation in mitotic chromosome, meiotic pairing and yield characters of wheat and triticale are largely influenced by the environmental condition such as light, temperature, availability of water and nutrition in the cultivated soil.

The objective of the present study was to compare the yield characters of Zalote 2 and Chinese wheat grown in Zalote Agricultureal Research Farm.This research was carried out to compare the morphological characters and the yields of hexaploid wheat Zalote 2 and Chinese wheat. This paper aims at giving the information to farmers for their economic income and to those researchers for their further studies.

MATERIALS AND METHODS

Materials

Tiller numbers, spike characters and seed weight for the present study were obtained from the hexaploid wheat cultivar Zalote 2 (*Triticum aestivum* L.) and Chinese wheat collected from Zaloke research farm in Monywa, Sagaing Region.

Methods

Data collecting for tiller numbers and spike characters

After all the plants were fully matured, number of fertile tillers from 25 individual plants were counted. Similarly, 25 primary spikes (i.e. first appearing spike) from plants were harvested and labeled separately for studying the spike and seeds characters. Spike length, density of spikelet, number of spikelets per spike, number of florets per spike, fertility of first and second floret (i.e genetically control character) of each spike, number of seeds per spikelet, number of seeds per spike, individual seed weight (25 seeds) and micro test-weight (i.e 100 grains weight, weighting for 10 times) were also measured and recorded to compare the morphology and yield characters.

RESULTS AND DISCUSSION

(i) Tiller number

Number of tillers per plant of hexaploid wheat *Triticum aestivum* L.cv. Zalote 2 was occurred highest number of 2.97 and Chinese wheat was occurred the lowest number of 2.36. Zalote 2 exhibited significantly superior in occurrence of fertile tillers per plant than Chinese wheat.

(ii) Spike length

The longest spike length of hexploid wheat Zalote 2 observed 17.75 cm in mean length and it length is significantly superior than the Chinese wheat which is the shortest length of 13.83 cm in mean length was resulted.

(iii) Spike density

The spike density result of hexaploid wheat Zalote 2 possessing 2.93 spikelets per 1 cm of spike in mean value, while the variety of Chinese wheat have the least dense spikelet with 2.67 spikelets per 1cm of spike.

(iv) Spikelets per spike

The highest number of spikelets per spike was observed on hexaploid wheat Zalote 2 plant possessing 28.22. The lowest number with 21.26 in number occurred in Chinese wheat.

(v) Number of florets per spikelet

No significantly different from one to another in number of florets per spikelet. Generally uniformly 3 to 5 number of florest per spikelet were observed.

(vi) Fertility of first and second floret

Hexaploid wheat Zalote 2 plant was not significantly different in fertility of first and second floret from the Chinese wheat.

(vii) Number of seeds per spikelet

The number of seeds per spikelet of hexaploid wheat Zalot 2 was 2.98 seeds per spikelet in mean value significantly superior than the Chinese wheat which was possessed 2.31 seeds per spikelet in mean value.

(viii) Number of seeds per spike

The mean seeds per spike of Zalote 2 was 62.26 significantly superior than the Chinese wheat which was occurred 42.25 mean number of seed per spike.

(ix) Individual seed weight

Individual seed weight of hexaploid wheat Zalote 2 was 0.0402 gm which was no significantly superior than the seed from Chinese wheat plant was 0.0399gm.

(x) 100 seeds weight (Micro test-weight) (Plate 3)

The 100 seeds weight of the Zalote 2 wheat and Chinese wheat ranges between 4.623 and 4.203 gm respectively and no significantly different from one to another.

Fig 1. Zalote 2 Wheat Plants grown in randomized design

Fig 2 Chinese Wheat Plants grown in randomized design

Fig 3. Zalote 2 Seeds

Fig 4. Chinese Wheat Seeds

Fig 4. Spikes Characters of Zalote 2

Fig 4. Spikes Characters of Chinese Wheat

Fig 7. Spike Characters of Zalote 2

Fig 8. Spike Characters of Chinese Wheat

Fig 9. Spikelet characters of Zalote 2

Fig 10. Spikelet Characters of Chinese Wheat

CONCLUSION

Environmental conditions such as soil type, texture and mineral and nutrients component of the soil had influenced on the morphological characters as well as the yield and cytological characters of the crops (Hsan and Shigenaga, 1989.)

In the present study, it was observed that tiller number per plant, length of spike , density of spike , spikelet per spike , number of seed per spikelet and seed per spike characters of hexaploid wheat cultivar Zalote 2 and Chinese wheat were significantly different from each other.

For the micro test weight character, individual seed weight, number of florets per spikelet , fertility of first and second florets obtained from Zalote 2 wheat and Chinese wheat were not significantly from different each other. Under the same environmental condition, the cultivar of hexaploid wheat cultivar Zalote 2 is as good as that of Chinese wheat.

The objective of the present study is to compare the morphological characters and seeds characters of hexaploid wheat cultivar Zalote 2 and Chinese wheat. This research is to give the information to the farmers and to those researchers for their further studies. The yield stability of wheat check is governed not only by its genes but also by the environmental or the soil nutrients factors.

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REFERENCES

Bohnert, H. D. Nelson, R. Jenson, (1995) – Adpatation to environmental successes, wheat cultivars. 1099-1111

Flavell, R.B., M.D. Bennette , A.G. Seal and J. Hutchison (1987) Chromosome structure and organization. Wheat breeding. Chapman and Hall. London, New York.

Giorgi, B,. (1969) Analisi cariotipica di *Triticum durum* Desf.var. "Cappelli". Genetic Agraria. 19:176-183.

Hsan, S.A. 1989-Studies on grain characters of triticale, Division of Tropical Agriculture. Faculty of Agriculture, Kyoto University, Japan.

Khan, S., (1963) Karyotype analysis of "Hold fast" a cultivar of *Triticum aestivum.* Cellule . 63: 293-305

Kihara,H. (1919) Genome analysis between *Triticum* and Agelops. Cytologia: 14: 135-144

Lorz, S.P, Kirby, E.J.M (1985) . Grain growth and development of old modern Australian wheat. Field crop res.21.

Riley, R, (1965) Cytogenetics and Plant breeding. In "Genetics Today", London.

Sax, K., (1922) Effect of temperature on nuclear cell division in *Tradescantia.* Heriditas, 91:315.

Sharam, A.K, and A. Sharma (1980). Chromosome techniques-theory and practice. 3rd. ed. Butterworths, London.

Shigenaga, S., and E.N Larter (1971) . Karyotype analysis of hexaploid triticale. Can.J.Genet. Cytol, Japan. 13:585-591.