VERIFICATION OF VARIETAL PURITY IN WHEAT

BY

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ABSTRACT

Seed categories and crop varieties play an important role in wheat production in Egypt, which effect on genetic purity of wheat genotypes. So, this investigation aimed to study the effect of seed sources and varieties on yield and its attributes. Two field experiments were conducted at the Experimental Farm of Giza Agricultural Research Center (ARC), Giza Governorate, Egypt, during the two successive winter growing seasons of 2014/2015 and 2015/2016 on the optimum sowing date 15th of November. Four wheat varieties (Misr1, Gemmeiza 11, Giza 168 and Sids 12) and their seed categories (Basic, Certified and Farmer saved seeds) were used in this study. Yield and its attributes and off- type percentage were estimated in the field experiment, further more phenol color reaction and ISSR technology were carried out at Seed Technology Department Laboratory. The results indicated significant differences between wheat genotypes and its seed categories for the most traits. Gemmeiza 11 variety gave the highest value in most studied traits *i.e*., flag leaf chlorophyll content SPAD, flag leaf area, spike length, No. of spikes /m^2, No. of grains/spike, 1000-grain weight and grain yield/fad., while the lowest value of those traits were recorded by Misr 1 variety. For the effect of seed categories on yield and yield attributes, basic seeds gave the greatest value for most characters, except for plant hight where farmer seed recorded the highest value. Meanwhile insignificant effects were obtained from seed categories on flag leaf chlorophyll content SPAD. The interaction effects between genotypes and seed categories indicated that Gemmeiza 11 and Sids 12 varieties with Basic and Certified seed categories gave the highest value of most traits, while Misr 1 variety with farmer seed category gave the lowest value for yield traits. Insignificant effects were

noticed between wheat genotypes for the off- type % while seed categories showed highly significant effects where, Farmer saved seed recorded the highest value and Basic seed gave the lowest value for these traits.

According to seed quality characters, no significant differences were recorded between Varieties or between seed categories during both season and their combined analyses in germination percentage. While, significant differences were recorded in the most germination measurements and electrical conductivity test.

Wheat genotypes showed different color reaction to phenol while seed categories took the same pattern in phenol color reaction for each genotype.

Positive significant correlation coefficients were existed between grain yield and each of spike grain weight, number of grains/spike and 1000-grain weight, respectively, but negative highly association correlation was noticed between grain yield and off-type percentage. Also, positive significant correlation coefficients were recorded between 1000- seed weight and both of chlorophyll content and spike grain weight, however it was negatively significant correlated with seed vigour index, seedling length and seedling length rate.

Eight ISSR primers were used for fingerprinting the four wheat cultivars and their seed categories produced 97 band, 31 of them were polymorphic (68.04%) polymorphism. The highest level of polymorphism was observed in primer HB-12 which showed 95.00% polymorphism, while the lowest polymorphism was 28.57% in primer HB-09.

CONTENTS

LIST OF TABLES