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Productivity of some new introduced crop species with low water requirements in Mediterranean region with special reference to Egypt

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Introduction: The current water budget in Egypt show that the annual water demand exceeds the available fresh water by 6 billion m³/year (Abou-Zeid, 1992). Water uses are rising because of the ambitious land reclamation programme, growing population, steady rural development and urbanization plans and expanding the industrial sector. Therefore, it is essential to develop water resources through untraditional ones or introduction of new crops characterized with low water requirements. Therefore field trials were conducted to evaluate some new crops introduced recently in Egypt for their low water requirements under Mediterranean climate. The evaluation included triticale (*Triticale hexaploide* Lart) and mungbean (*Vigna radiata* (L.) Wilczek) as double purpose crops. Mung bean was evaluated as a new introduced crop for seed or forage in arable lands and proved to be a short duration crop (70-90 days) and can be incorporated strongly in the Egyptian agriculture. Mung bean was also evaluated as a new summer forage crop in Egypt.

Materials & Methods: Two new crops with limited water demand (triticale 4320 m³ ha⁻¹, and mungbean 3800 m³ ha⁻¹ were chosen and evaluated. The physical and chemical analysis of the soil was (pH 8.5; EC 0.24 dsm⁻¹; OM .73; N 1400 ppm; P 132 ppm; K 826 ppm; Fe 3694 ppm; Mn 56.8 ppm; Zn 17.8; Cu 3.78 ppm). Five triticale genotypes imported from CYMMIT and chosen from 36 triticale strains were evaluated for forage productivity and grain yield. The tested genotypes were grown in marginal land in sandy calcareous soil. The genotypes evaluated as double purpose crop where the plants were grown and at 60 days from sowing and harvested for forage and left to the end of the season for grains. Mungbean (*Vigna radiata* (L.) Wilczek) is a summer pulse crop greatly widespread in different regions of the world. It is a new introduced crop in Egypt, for its acceptable nutritive value of seeds (protein; 25-28%, carbohydrates; 62-65%, oil; 1-1.5%, fibre; 3.54.5% and ash 4.5-5.5%). Moreover, it has numerous utilities and used primarily as a food crop because it is a major source of protein in cereal based diets for its high lysine content. Mungbean flour is used for making bread and it is an important source of starch production. Mungbean is a short duration crop (70-90 days) and mostly with a fully determinate nature; therefore its water requirements are low, compared to other summer crops grown under Egyptian conditions. Six mungbean genotypes were evaluated for their productivity. The common well adapted local variety KAWMY -1 was tested for forage yield at different rates of seeds. Mungbean genotypes tested for seed yield were Kawmy-1, V2010, VC1000, VC2719 M53 and T44.

Results: Triticale: Data presented in table (1) show that triticale genotypes significantly differed in their productivity in grain yields. Genotype Fahd 5 proved to be the most adaptable one for such calcareous soil significant. Differences among triticale evaluated genotypes in forage and seed yields. Forage yield ranged between 1.85 and 6t ha⁻¹, according to the genotype. Mungbean: Data released indicated that -Kawmy-1 variety surpassed the other varieties and was the highest yielding variety in the tested genotypes or varieties. VC1000, M53 and VC2719 are early maturing and promising. Other varieties could be used as genetic sources in mungbean breeding programs. Mungbean forage yields ranged between 48 and 99.9 (ton /ha Fresh weight) and forage yield increased with increasing cutting date up to 90 days and seeding rate at 144kg/ha. Similar results were obtained by Shaban Et al 2015.

Conclusions: It can be concluded from this study that triticale and mungbean can be easily incorporated as double purpose utilization new crops either for seed or forages with low water requirements in the forthcoming decades in Egypt.

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