



Re-introduction of Old Varieties of Common Wheat in a Marginal Land of Campania Region: Yield and its Components

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Introduction

Common wheat (*Triticum aestivum* L. subsp. *aestivum*), as well as durum wheat, are species with significant agricultural importance as cereal grains throughout much of the world. Historically, traditional farmers planted diverse assemblages of wheat genotypes to lower the risk of failure and increase food security; this practice led to the development of different wheat landraces, maintained by traditional farmers to meet their social, economic, cultural, and environmental needs. The genetic structure of landraces can be defined as a mixture of genotypes that evolved, largely by natural selection, under the environmental conditions in which they were grown. Nowadays, crop genetic diversification can be part of an overall strategy exploiting biodiversity to cope with biotic and abiotic stresses, and to overcome the limits linked to cultivation in marginal lands. Therefore, the aim of the current research was to recover and evaluate the adaptability of seven old varieties and/or landraces to a hilly internal area of the Campania Region.

Materials and Methods

Site Sant'Angelo dei Lombardi –AV (Campania Region), 700 m a.s.l.
Soil clay soil (clay = 44%, silt = 22%, sand = 34%)
Crop Common wheat (*Triticum aestivum* L. subsp. *aestivum*)
Sowing 12 December 2019
Treatments Seven old varieties and/or landraces of common wheat were tested: Risciola del Fortore, Carosella, Romanella Martuccio, Romanella Mirra, Romanella Baselice, Frassineto Colline di Roseto, and Frassineto Mirra
Experimental Plot 4 m² (2 x 2 m)
Fertilization urea 100 kg ha⁻¹
Harvest 14 July 2020

At the harvest, yield, harvest index (HI), culm height, spike length and average weight, grain percentage humidity, 1000 seeds weight, and shriveled seeds were determined.

Results

The mean yield of the 7 landraces reached 3.0 t ha⁻¹, the three Romanella landraces ranged between 3.3 and 3.9 t ha⁻¹, but also Risciola overcame 3.0 t ha⁻¹, and it was not been different from the previous three (Fig. 1). The two Frassineto landraces and the Carosella were not different between them, with a mean yield of about 2.1 t ha⁻¹ (Fig. 1). The HI was always low, below 20%, except for the Carosella which reached 21.2%; the plant height was over 90 cm for the four most productive varieties, which were not different between them, instead, the lowest plants were those of the two Frassineto landraces (Table 1). However, the two Frassineto had the lowest values of 1000 seeds weight (21.1 g with respect to 38.7 g of all other varieties), probably due to the high percentage of shriveled seeds: 13.3% vs. 8.9% of the three Romanella and 1.3% of Carosella; Risciola del Fortore had the highest value but it was different only from Carosella and Romanella Mirra (Table 2).

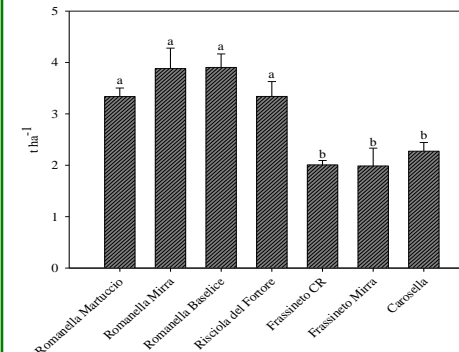


Figure 1. Yield of the seven old varieties-landraces of common wheat.

Table 1. Yield components of the seven old varieties-landraces of common wheat.

Variety	Plant height cm	IR %	Spike weight g spike ⁻¹	Spike Length cm
Risciola del Fortore	99.0 a	17.2 ab	1.7 c	11.0 ns
Carosella	80.7 b	21.2 a	2.2 ab	11.2 ns
Romanella Martuccio	97.0 a	16.2 b	2.3 a	10.6 ns
Romanella Mirra	98.3 a	19.7 ab	2.4 a	10.8 ns
Romanella Baselice	93.7 a	16.3 b	2.0 b	10.5 ns
Frassineto CR	65.0 c	18.1 ab	2.3 a	12.1 ns
Frassineto Mirra	65.0 c	19.7 ab	2.4 a	10.7 ns

Table 2. Yield quality of grain of the seven old varieties-landraces of common wheat.

Variety	Grain Humidity %	1000 seeds Weight g	Shriveled seeds %
Risciola del Fortore	10.5 ns	38.7 ab	16.7 a
Carosella	10.5 ns	33.7 b	1.3 c
Romanella Martuccio	11.3 ns	40.3 ab	9.3 ac
Romanella Mirra	10.3 ns	41.0 a	4.7 bc
Romanella Baselice	10.8 ns	39.7 ab	12.7 ab
Frassineto CR	9.3 ns	22.3 c	11.3 ab
Frassineto Mirra	10.3 ns	20.0 c	15.3 a



Conclusions

The results of this preliminary research show that the genetic group of Romanella seems to be suitable to hilly internal area conditions, with a good productive performance, also better than Risciola del Fortore which however reached a high yield level.