Research on the Influence of Density and Fertilization Concerning the Sunflower (*Helianthus annuus*) Hybrids Quality on the Cambic Chernozem from Fundulea

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ABSTRACT

Research was done in an experimental field of NARDI Fundulea, not irrigated variant, the main purpose being the influence of density and fertilization on the production quality of three sunflower hybrids (a1 – Performer; a2 – KWS Barolo RO; a3 – PR64A89). Concerning the plant density, they were used two variants, respectively c1 of 50,000 plants/ha, and c2 of 60,000 plants/ha.

Other significant factors were the climate and soil conditions. In the area, the experimental conditions are characterized by the transition from steppe to forest steppe that allows especially the formation of cambic chernozem category soil. The quality data processing was performed following the analysis in the laboratory of sunflower seeds, yielded as samples of 750 g. After removing the impurities they have been determined 1000GrainWeight, hl mass, and the seeds oil content in the conditions of 2012 year climate.

Keywords: *chernozem, Helianthus annuus, hybrids, hl mass, 1000GrainWeight.*

INTRODUCTION

Experimental field is in the East of Romanian Plain area, on the Mostistea river side, along the border between Vlasiei Plain and South Baragan Plain. As geographical position is approximately 44 ° 30 ' North latitude and 24 ° 10' East longitude, on the territory of the Fundulea town, Călărași County, 34 km East of Bucharest. Fundulea groundwater depth is about 14 m and an average elevation of 56 m. The area of vegetation is at the crossing between the steppe and forest steppe. The climate is predominantly character. The frequency of dry years is over 40%. They are common drought periods, of 10-14 days, in May-June, and of about

30 days or longer at the beginning of spring and especially at the beginning of fall. The duration of sunshine is of 2,165 hours multiannual average (Partal *et al.* 2008).

The research objectives aimed at optimizing culture technology in order to achieve maximum and constant sunflower yield, in the soil and climate conditions of southern Romania, also following the economic efficiency and environmental protection.

Due to its high oil content in seeds commonly exceeding 48-50% of the dry substance, sunflower is a typical oleaginous plant, whose economic value derives 80% of its edible oil (Bilteanu 2003).

AIMS AND OBJECTIVES

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MATERIALS AND METHODS

Research were performed in the experimental field of Systems of Sustainable Agriculture and Crops Fertilization (SSA-CF) not irrigated version, from NARDI Fundulea, pursuing the influence of density and fertilization on the harvest quality of three sunflower hybrids (a1 – Performer; a2 – KWS Barolo RO; a3 – PR64A89).

Concerning the plant density they were used two variants, c1 of 50,000 plants/ha, and c2 of 60,000 plants/ha.

An important influence factor was the soil. Experimental conditions in the area are characterized by the transition from steppe to forest steppe that mostly allows the formation of cambic chernozem soil category. Humidity higher than in the steppe led to a proliferation of the clay formation. So, a large part of the clay content from the A level migrated towards the limit between levels A and B.

Humus content is higher in the first 15 cm due to the former beds of leaves and gradually decreases towards depth (Partal *et al.* 2008).

The experimental diagram is three factorial type, 3 x 3 x 2, ordered in three repetitions by the method of subdivided parcels. The experimental results were statistical processed using the variance analysis method (Gologan *et al.* 1981).

The experiment was located on uniform land in terms of fertility and landscape, on a chernozem soil, specific for the experimental area. The previous crop was wheat in all experimentation years.

The total experimental area was of 11,760 m². The total surface for the experimental plot was 168 m², and harvested area of 112 m².

In order to organize the experiment it was used biologic material consisting of 3 sunflower hybrids. Plants cultivation was performed in optimum technological conditions, specific to the cultivation area, the studied genotypes comprising three hybrids: Performer (control – semi-late hybrid), Barolo RO (semi-late hybrid), and PR64A89 (semi-late hybrid).

RESULTS AND DISCUSSION

The highest HM and 1000GrainWeight values were registered at the variant fertilized with manure (20 t/ha) and a density of 50,000 plants/ha.

The most favorable values were obtained from the hybrids PR64A89 and Performer, where HM was of 38 kg/100 l, respectively of 37 kg/100 l, 1000GrainWeight of 54.7 g, respectively of 55.5 g.

CONCLUSION

From the analysis of these data, we can conclude that, in terms of a year with uneven distribution of rainfall in time and space, a variant yielded the best values of quality indicators is that fertilized with manure (20 t/ha) where it was used the hybrid PR64A89.

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