

Identification of promising confectionery sunflower hybrids from INTA breeding program in Argentina

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INTRODUCTION

Currently, about 10% of the annual world production of sunflower is used for non-oil purposes. Market demand and production areas are increasing due their nutritional value for both human and animal consumption. Confectionery sunflower breeding is like oil sunflower breeding, but has specific objectives related to hull color, kernel size, reduced scuffing and other quality traits. Breeding programs take advantage of heterosis, which is usually present in hybrids from unrelated inbred lines, so it is important to find genotypes with high combining ability that are not influenced by environmental conditions.

MATERIAL METHDOS

The aim of this study was to identify the best confectionery-type hybrids with economic potential from elite inbred lines of the INTA breeding program, evaluating yield (kg/ha) and grain size (measured with a four-mesh sieve: 9.5 mm, 8.75 mm, 8 mm and 6.5 mm) during three seasons (2020/21, 2021/22, 2022/23) in Manfredi, Argentina (coordinates: -32, -64). The experimental unit consisted of two furrow plots with a length of 5.10 m and a spacing of 0.70 m, in a randomized complete block trial with three replicates (Fig. 1).

RESULTS AND DISCUSSION

The average yields in the 2020/21, 2021/22, and 2022/23 seasons were 1331.67 kg/ha, 2765.5 kg/ha, and 1816.69 kg/ha, respectively. Among the hybrids, 102-2.401, 369.455-1, and 333.455-1 stood out with superior performance. For the caliper measurement in 2020/21 season, the average percentages for the hybrids were as follow: 40% (9.5 mm), 27% (8.75 mm), 11% (8 mm) and 8% (6.5 mm) (Fig 2). Notably, BS58 had the highest percentage in caliper greater than 9.5 mm, at 89%. In the 2021/22 season, the average percentages were: 49% (9.5 mm), 26% (8.75 mm), 11% (8 mm) and 10% (6.5 mm), with the hybrid 101.401 having the highest percentage (91%) for calibers larger than 9.5 mm.

CONCLUSION

In summary, it was possible to differentiate confectionery hybrids based on the characteristics evaluated, observing genetic variability. This information made it possible to identify the most promising lines for further breeding and to evaluate their combinability with lines from the INTA breeding program.



Figure 1. Aerial view of the comparative performance test.



Figure 2. View of four-mesh sieve: 9.5 mm, 8.75 mm, 8 mm and 6.5 mm. respectively and three hybrids of this study.