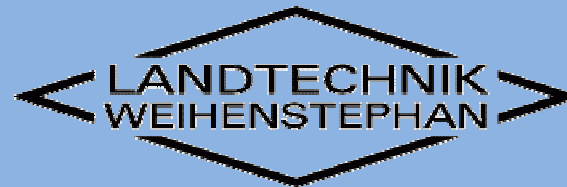


First Results of Investigations with Narrow Row Equal Space Planting of Corn for Silage

Demmel M., Auernhammer H., Kormann, G., Peterreins, M.

Technische Universität München
85350 Freising-Weihenstephan, Germany



**Written for Presentation at the
1999 ASAE/CSAE-SCGR Annual International Meeting
Sponsored by ASAE/CSAE-SCGR**

**Sheraton Centre Toronto Hotel
Toronto, Ontario Canada
July 18-21, 1999**

Introduction

To optimize corn production a lot of attempts have been made in last year's. One of those was to plant corn in narrow rows with row widths between 300 to 500 mm. Higher wet yields and dry matter yields are ascertained. Available results show:

- The Landwirtschaftskammer Rheinland-Pfalz (Germany) measured 6,4% more wet yield and 9,2% more dry yield of maize for silage, the level of corn was a bit higher.
- A farmer in Minnesota tried to grow corn with a row width of 15 inches (38 cm). He harvested 22 bushels per acre more in contest with the 75 cm- row.
- BURNS 1998 summarizes a higher starch yield in case of growing corn with smaller row widths and simultaneously with a higher plant population.
- REICHENEERGER 1999 reported higher yields, growing with 20 inches rows. The canopy closed earlier and there was less weed in the herds. Also the evapotranspiration was reduced.
- Pioneer Hi-Bred grew up corn with a row width of 15 inches within different surroundings. In about 90% of the trials there was a higher yield of the 15 inch row compared to the 30 inch row.

If the corn is planted in equal spaces there should be a further increase of the positive effects on yield and evapotranspiration.

Material and Method

To get equal spaces between single plants corn has to be planted in equal triangle distribution.

Therefore a standard corn planter from Kverneland- Accord was modified.

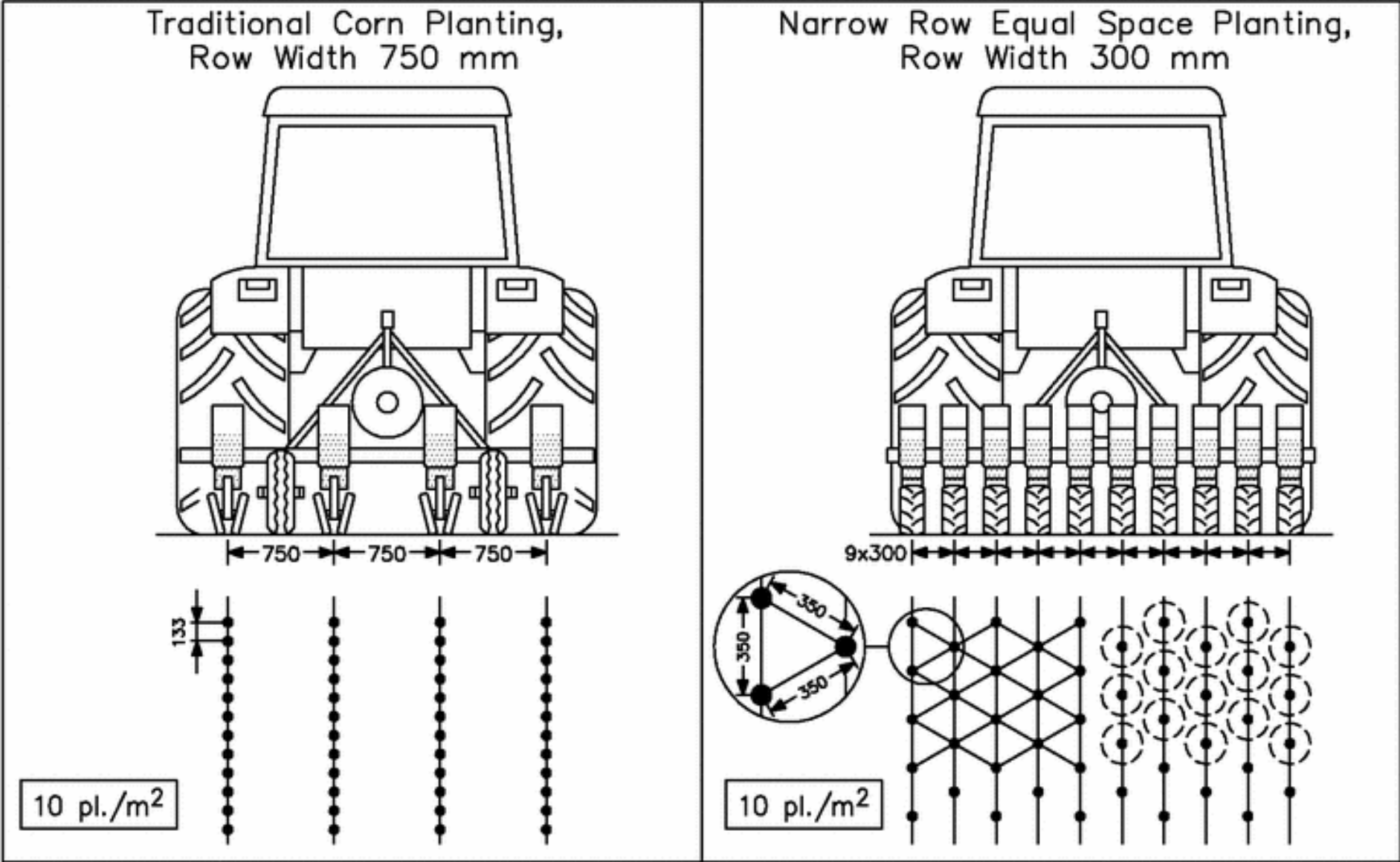
Based on the row with of 300 mm, the distance between two plants has to be 346 mm to get equal triangles, corresponding to a plant population of 96,000 plants per hectare.

The synchronization of the planter units was reached by a central drive and modified and adjusted seed wheels.

Recognizing former results of examinations on narrow row planting, the main points to investigate were the effects of narrow row equal space planting in comparison to traditional corn planting regarding to

- corn's bite and canopy
- wet yield
- dry matter yield
- ingredients' concentrations and their yield
- evapotranspiration

Traditional Corn Planting in Comparison with narrow row equal space planting



Used corn planter



Experimental plan

	plant population 8 per m ²						plant population 12 per m ²						plant population 10 per m ²					
	Prinz		Major		Carrera		Prinz		Major		Carrera		Prinz		Major		Carrera	
	ESP	TP	ESP	TP	ESP	TP	ESP	TP	ESP	TP	ESP	TP	ESP	TP	ESP	TP	ESP	TP
repetition 1	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m
repetition 2	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m
repetition 3	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m
repetition 4	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m
repetition 5	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m	9m	15m

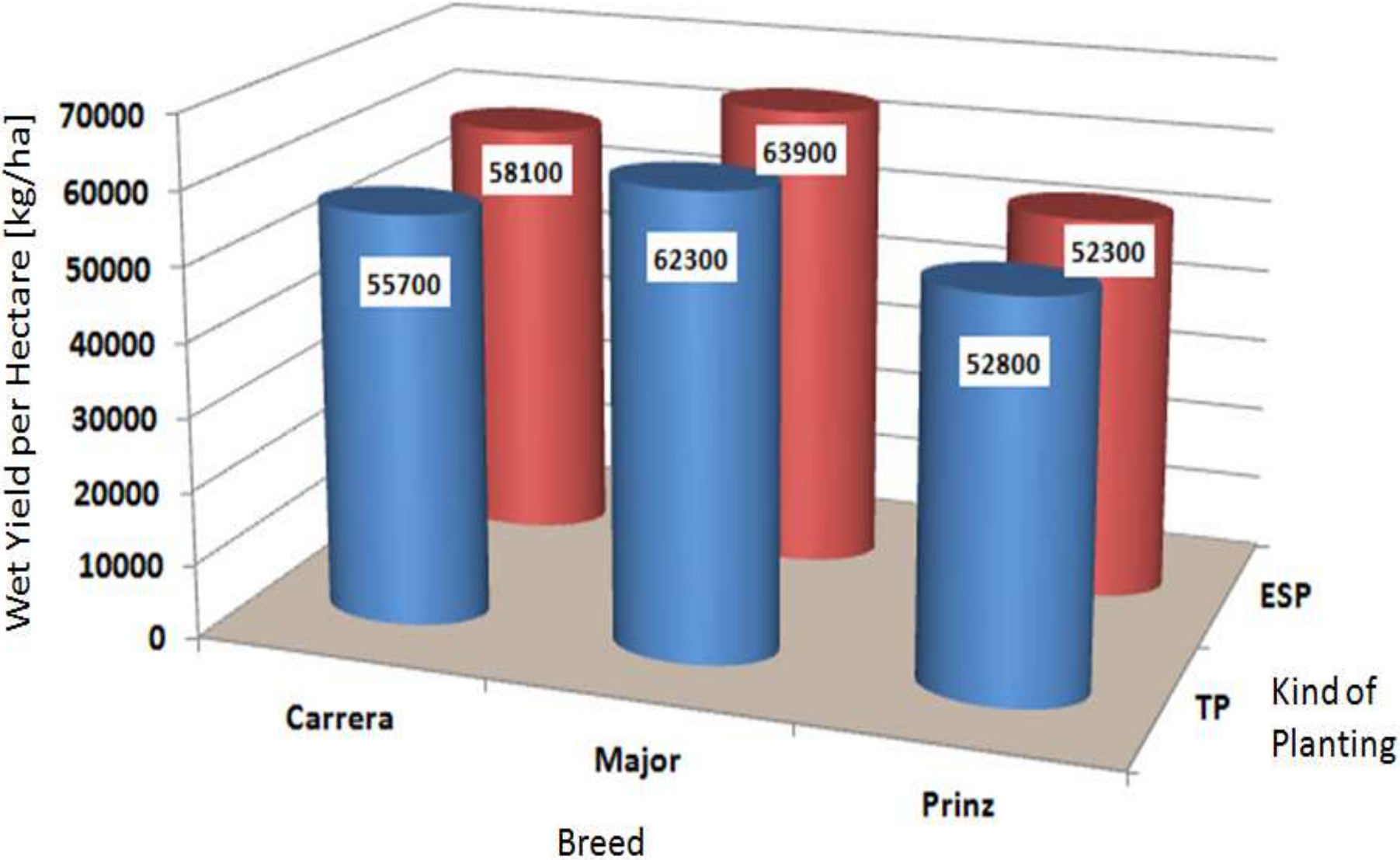
ESP: Narrow Row Equal Space Planting

TP: Traditional Planting

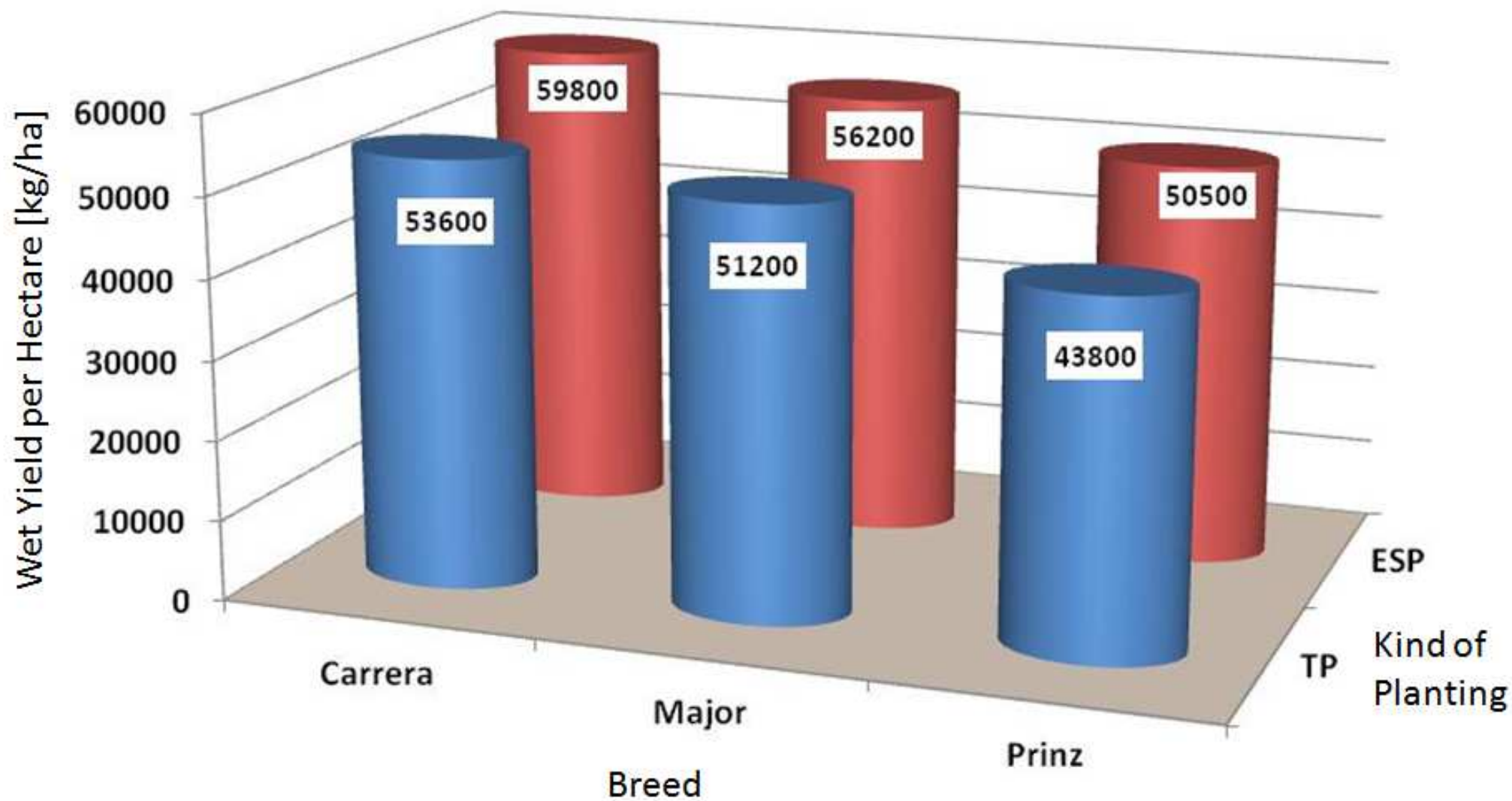
Equal triangle distribution of narrow row equal space planting



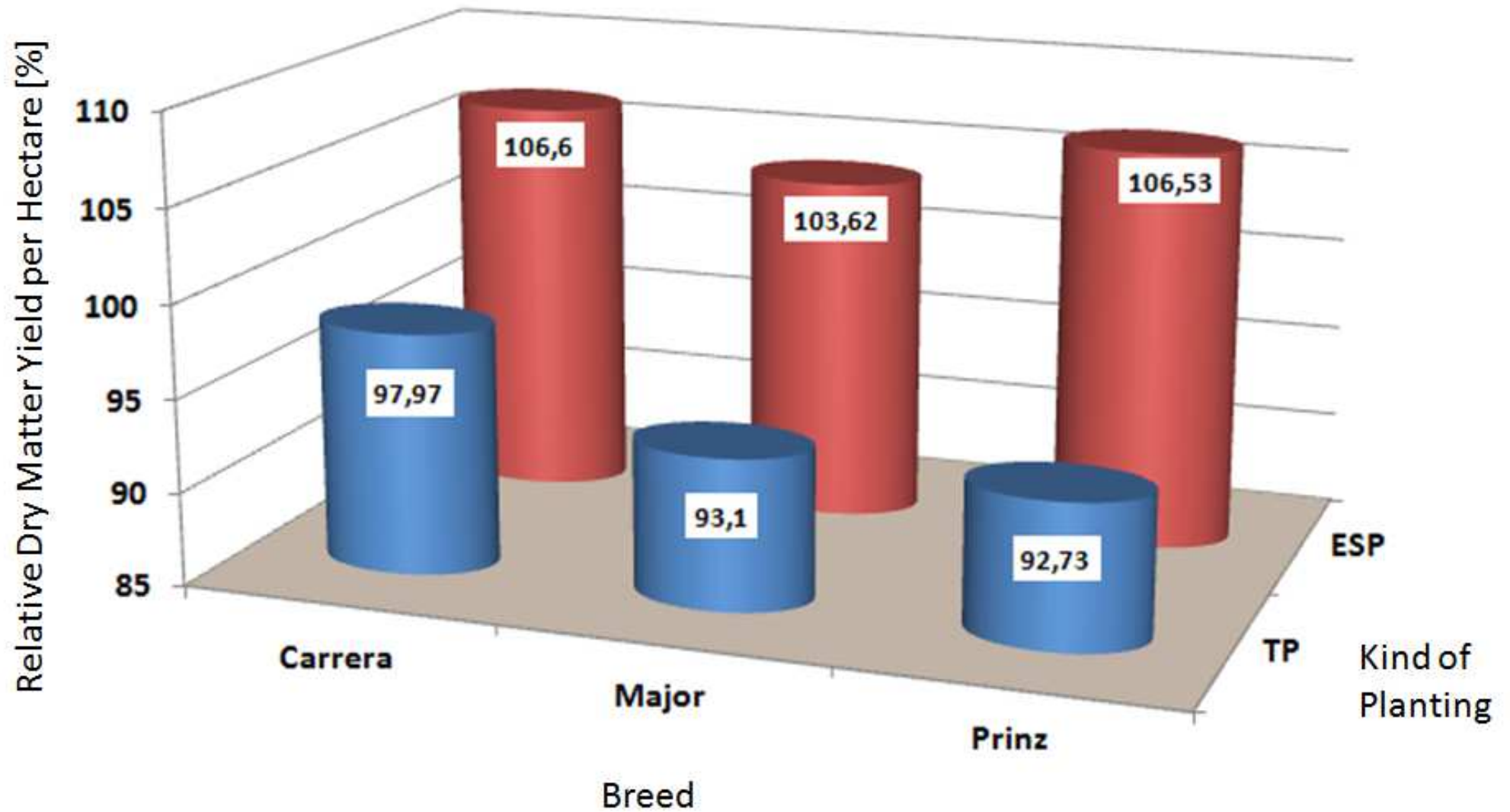
Wet yield per hectare in Langenbach



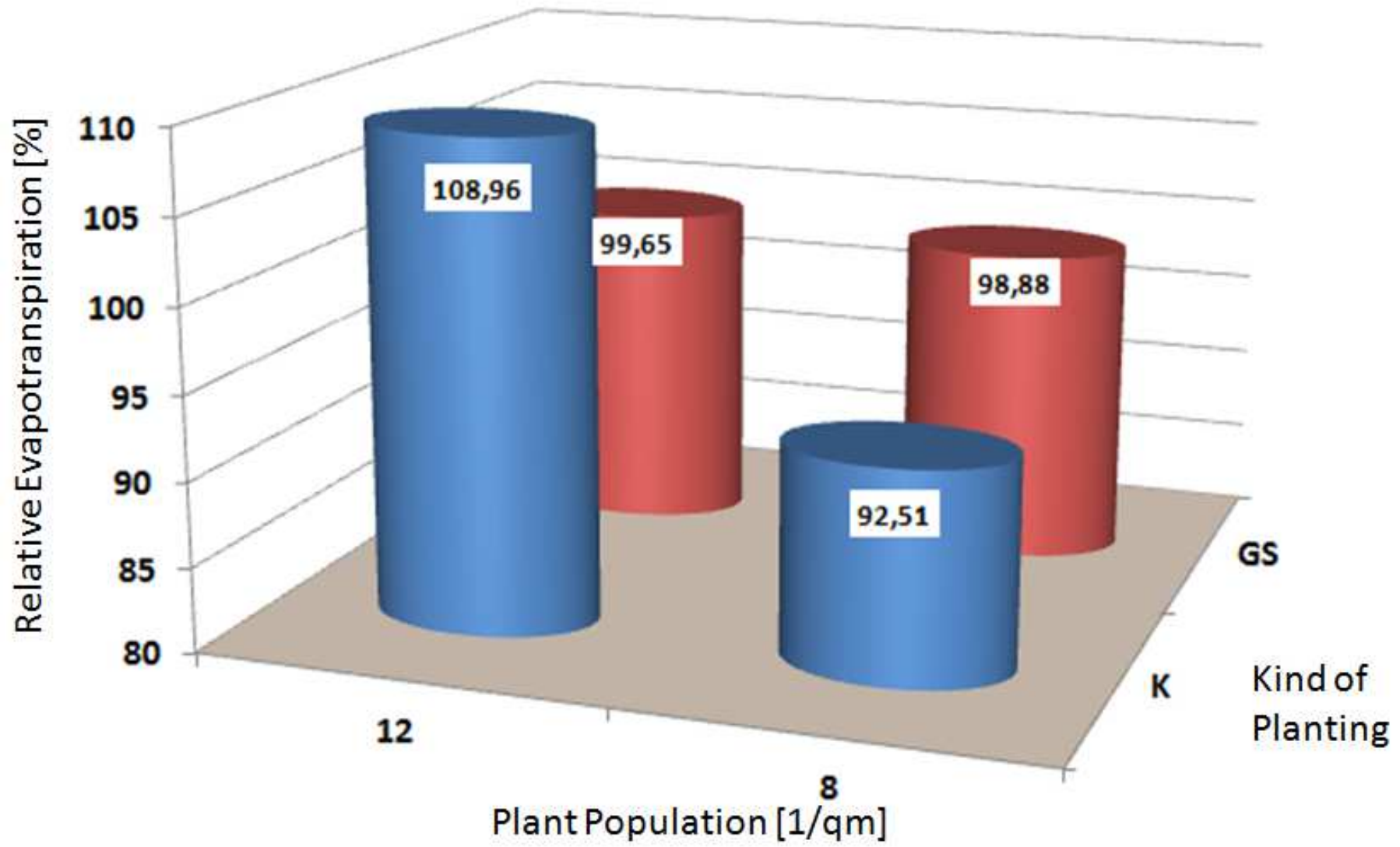
Wet yield per hectare in Neuhausen



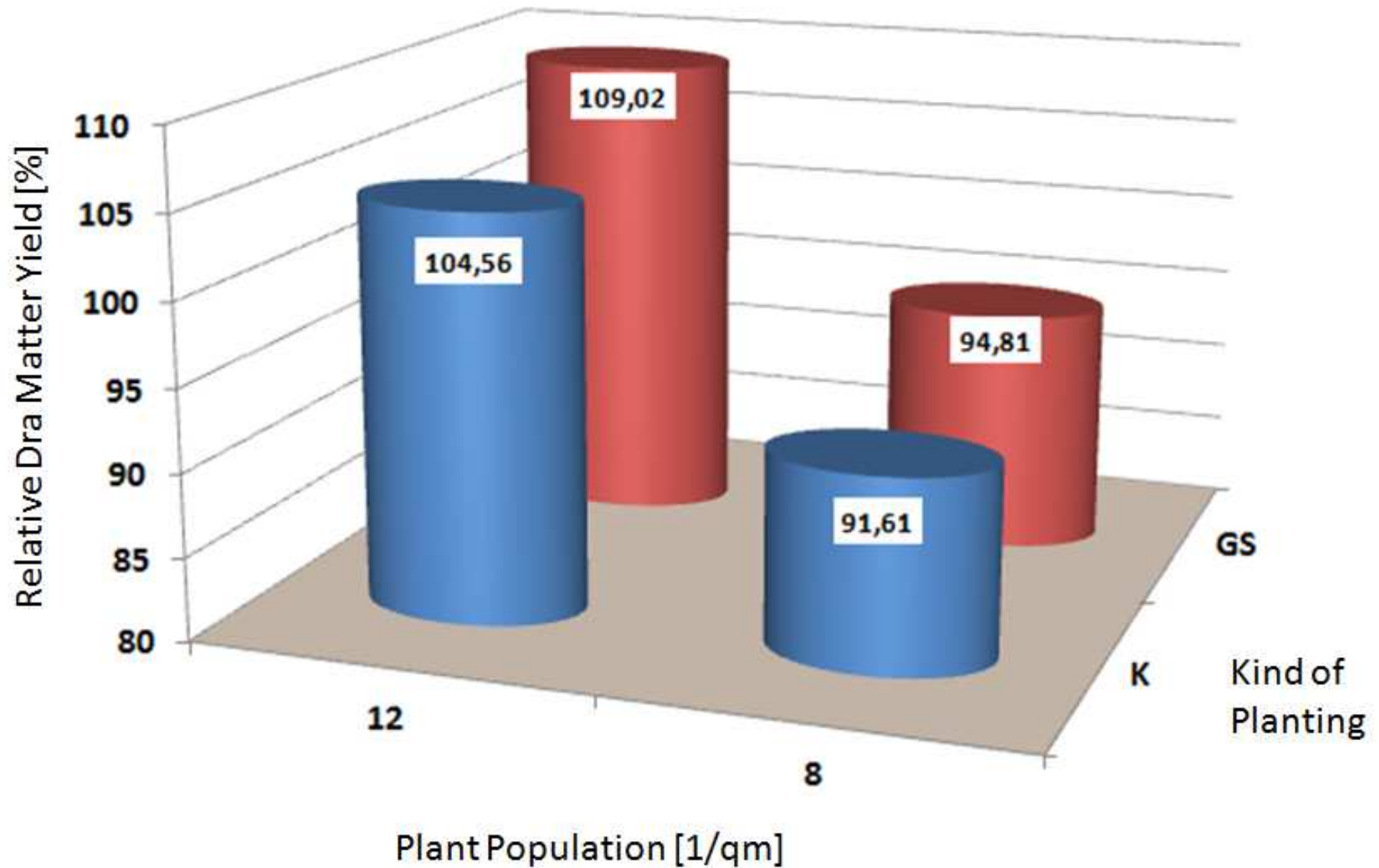
Relative dry matter yield per hectare in Neuhausen



Relative evapotranspiration in Langenbach



Relative dry matter yield in Langenbach



Conclusions

The technical implementation of narrow row equal space planting with modified available equipment was very successful.

Narrow row equal space planting has shown a lot of advantages compared with traditional corn planting.

First there were higher wet yield and dry matter yield for all tested breeds.

There is no stable result regarding the content of the ingredients.

Also the evaporation of this kind of planting is smaller, because of a quicker canopy closing.

Acknowledgements

Thanks to the farmers who gave their fields for the investigations. KWS Corn Breeding donated the corn seed.

Kverneland-Accord supported the narrow row equal space planting with a ten row planter.

The Bayerische Landesanstalt für Bodenkultur und Pflanzenbau analysed the content of components.

The Institut für Pflanzenernährung made the investigations on evapotranspiration.