

HIGH DENSITY PLANTING CONFIGURATIONS FOR HIGH QUALITY COTTON IN SHORT-SEASON ENVIRONMENTS

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INTRODUCTION

Some southern Italy areas are characterized by a 170-180 days growth season for cotton, during which, in average, 1100 DD-15,5 °C are accumulated. In cotton productive areas of Spain, similar to the one considered from the climatic point of view, the scarceness of this environmental factor determines the need to adopt cultural strategies typical of the early crop (early sowing, plastic mulch, growth regulators application, defoliation).

High plant densities can improve earliness, but excessive interspecific competition can result in yield loss. Previous papers suggested that 20 plants m⁻² can combine favorable earliness, yield and fiber quality in regions characterized by short growing season. This work was aimed to evaluate if higher plant densities can improve earliness, and if interplant competition effects can be counterbalanced by a most favorable spatial arrangement.

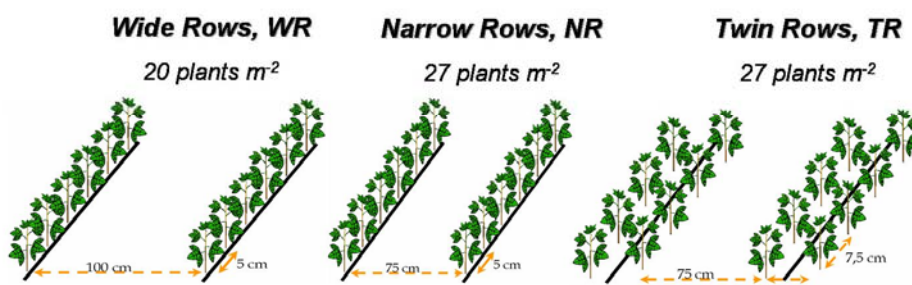


Fig 1. Planting configurations adopted in the trial.

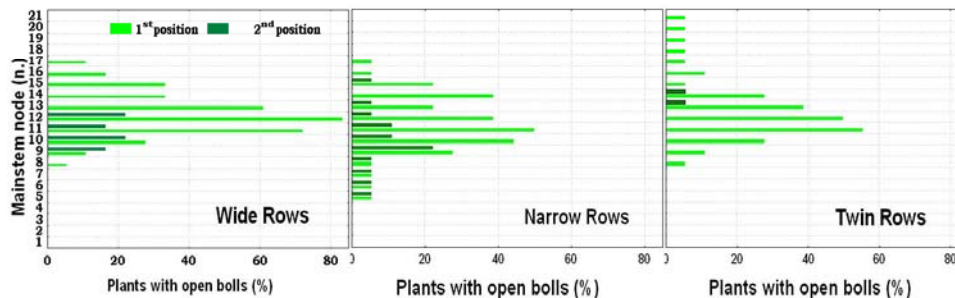


Fig 2. Bolls distribution as influenced by sowing configuration.

MATERIALS and METHODS

The conventional spacing in wide rows was compared with narrow rows and twin rows configurations (Fig. 1).

In all the cases, an early sowing under temporary plastic mulching was adopted, using cv Lachata (SPA).

The trial was carried on in Policoro (MT, ITALY) (40°13' N, 16°45' E, 15 m a.s.l.) during 1999 and 2000, using a strip-plot design with 4 repetitions.



RESULTS and CONCLUSIONS

The highest plant density modified the WR fruiting pattern, with a more vertical distribution of bolls (fig. 2). In relation to WR, yield location was lower in NR and higher in TR. At the same time, the incidence of 1st position bolls was higher in TR than in WR and NR (fig. 3). High plant densities did not cause better earliness; on the contrary, 85% of opened bolls was observed later in TR than in WR (fig. 4).

The different spatial arrangement determined higher yields in NR than in TR (fig. 5). Conversely, TR crop showed a more favorable canopy structure (prevalence of 1st position bolls, high boll-soil surface distance and better bolls exposition to working parts of harvesters) and a positive reduction in fiber fineness (fig. 6), so that future studies should be focused on the optimisation of a specific cultural technique, to obtain yield improvements associated with high quality fiber.

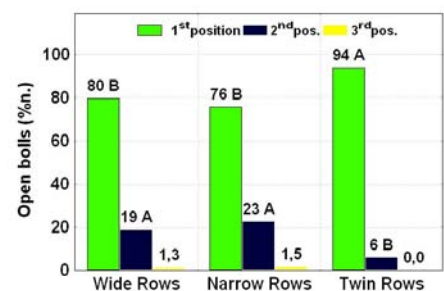


Fig 3. Boll position in WR, NR and TR.

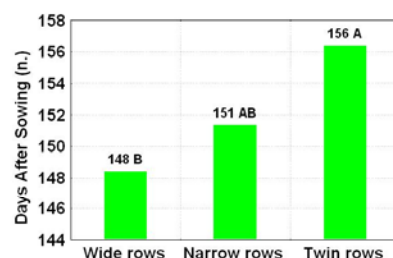


Fig 4. Days for 85% of opened bolls.

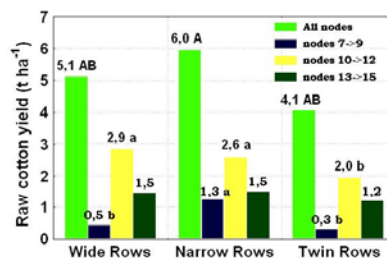


Fig 5. Yield distribution in WR, NR and TR.

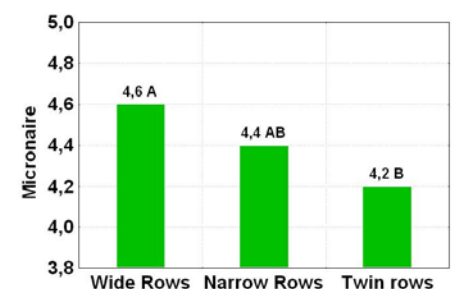


Fig 6. Fiber fineness (mg inch⁻¹).

REFERENCES

Galanopoulou-Sendouka, S., Sficas, A., G., Fotiadis, N., A., Gagianas, A., A., Gerakis, P., A., 1980. Effect of population density, planting date and genotype on plant growth and development of cotton. *Agronomy Journal*, 72, 347-353.