Effects of different mulching treatments on tomato production

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Climate change and increasingly frequent heat waves pose a serious challenge to tomato production, as high temperatures negatively affect flower fertilization and fruit quality. Lack of rainfall, drought periods, and extreme weather conditions further complicate cultivation, increase production costs, and lead to reduced yields.

Material & Method: In order to mitigate the negative effects of high temperatures, the Agriculture Extension Service in Sombor (Vojvodina Province, Serbia) established a field trial in which soil mulching was applied as an agrotechnical measure. This practice helps preserve soil moisture, reduces evaporation, and stabilizes temperature in the root zone. As a result, it improves conditions for plant growth and development, reduces stress, and decreases production losses in vegetable farming. The trial included the following variants: control, black plastic mulch, black plastic mulch with hay, black plastic mulch with straw, soil without plastic mulch with hay, and soil without plastic mulch with straw. The trial was conducted at the experimental field.

RESULTS & DISCUSSION

The selected variety was Novosadski jabučar, with seedlings produced in-house. The highest yield of first-class fruits was achieved in the variant with soil without plastic mulch with hay, amounting to 50.0 t/ha. This variant also recorded the highest total yield of 78.50 t/ha. The highest yield of second-class fruits was recorded in the control variant, reaching 40.0 t/ha. The results indicate a significant yield increase compared to the control and the standard practice of using black plastic mulch alone in production.

Variant	First class yield (t/ha)	Second class yield (t/ha)	Total yield (t/ha)	Dry matter (%)
Without mulching (control)	35,35	40,00	75,35	4,2
Black foil	20,75	19,50	42,25	3,7
Black foil with hay	24,25	15,50	39,75	4,4
Black foil with straw	42,50	17,00	59,50	5,4
Soil without foil with hay	50,00	28,50	78,50	3,9
Soil without foil with straw	32,50	22,00	54,50	3,8





CONCLUSION

The trial demonstrated that using hay as an alternative to plastic mulch significantly improved both first-class and total fruit yields of the Novosadski jabučar variety. The results highlight the potential of alternative mulching techniques to enhance productivity compared to standard practices. In the context of increasing climate variability, adopting sustainable agrotechnical measures, including careful variety selection and improved cultivation methods, is essential for maintaining high yields and crop quality.