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Izvorni znanstveni članak

### Mathematical models for optimization of group work in harvesting operation

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#### Sažetak

This paper research of productivity and work organization were investigated of a group made of five workers (two cutters, two tractor drivers and one cutter-inspector) and a team leader. The team was equipped with two tractors and three chain saws. The research was carried out in the area of management unit – Južna Krndija Kutjevačka, at an altitude ranging between 550 m and 750 m in a 55-year beech stand. Standard time was calculated on the basis of the mathematical model of multiple linear regression of effective time. The average team standard time for two cutters is 25.92 min/m<sup>3</sup> and the average standard time for two tractors ranges between 25.06 min/m<sup>3</sup> (150 m) and 33.20 min/m<sup>3</sup> (650 m). Standard time of the cutter-inspector is 4.93 min/m<sup>3</sup> and it was used as the basic unit. If one cutter-inspector were on the roadside landing, then the group should be made of 5.25 cutters and 5.08 (150 m) to 6.73 (650 m) tractors to achieve the optimum work results. The optimum size of the team changes depending on the distance of tractor skidding and it ranges between 11.33 members (150 m) and 12.98 members (650 m). The optimally organized team can produce 97.29 m<sup>3</sup>/day of wood assortments. Daily efficiency was calculated per member of team and it ranges between 7.68 m<sup>3</sup>/day (150 m) and 5.79 m<sup>3</sup>/day (650 m) and it is consequently by 79.3 % (150 m) to 35.2 % (650 m) higher than the realized daily efficiency of 4.28 m<sup>3</sup>/day per member.

On the basis of the modelled daily efficiency, the costs range between EUR 14.17 perm<sup>3</sup> (150 m) and EUR 18.80 perm<sup>3</sup> (650 m) and it is consequently lower by 44.2%(150 m) to 26.0% (650 m) compared to the realized costs of EUR 25.41 per m<sup>3</sup>.

#### Ključne riječi

mathematical model; team work; time study; productivity; costs



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Upute za pretraživanje

Moj profil

Registracija novih korisnika

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prijava

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