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UTJECAJ TEHNIČKIH ČIMBENIKA RASPRŠIVANJA NA POKRIVENOST LISNE POVRŠINE U TRAJNIM NASADIMA

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Disertacija⁽²⁾

Istraživanja su obavljena u vinogradu i nasadu jabuke s dva tipa raspršivača, aksijalni (*Hardi Zatur*) i radijalni (*Hardi Arrow*). Istraživan je utjecaj glavnih tehničkih čimbenika raspršivanja (tip mlaznice, brzina rada i norma raspršivanja) na pokrivenost tretirane površine, prosječni promjer kapljica, broj kapljica/cm² i zanošenje tekućine. Brzina rada raspršivača podešava se na 6 i 8 km/h, a norma raspršivanja na 250, 325 i 400 l/ha za nasad jabuke te 250, 300 i 350 l/ha za vinograd. Koriste se plave (*TR 8003*), žute (*TR 8002*) i zelene (*TR 80015*) *Lechler* mlaznice. Istraživanje se postavlja kao trofaktorijski poljski pokus sa 18 tretmana u 4 ponavljanja, kako za tip raspršivača tako i za vrstu nasada. Po tretmanu na stablo/trs postavljeno je 60 vodoosjetljivih papirića koji su obrađeni pomoću računalne analize slike i računalnog programa *ImageJ*. Uz glavna svojstva istraživanja, utvrđuju se indeks lisne površine i gustoće, brzina i protok zračne struje, radni tlak, usmjerenje mlaznica te se prate vremenski uvjeti tijekom istraživanja. Prije samog istraživanja raspršivači se testiraju prema europskom standardu *EN 13790*. Smanjivanjem *ISO* broja mlaznice, povećanjem brzine rada raspršivača te povećanjem norme raspršivanja povećava se pokrivenost tretirane površine, broj kapljica/cm² i zanošenje tekućine, a smanjuje se prosječni promjer kapljica. Usporedbom dobivenih rezultata istraživanja eksploatacijom aksijalnog i radijalnog raspršivača u vinogradu i nasadu jabuke, bolje rezultate postiže radijalni raspršivač (*Hardi Arrow*) u oba slučaja. Najbolji odnos pokrivenosti tretirane površine i zanošenja tekućine u vinogradu ostvaruje se s pokrivenošću tretirane površine od 64,22% i zanošenja tekućine od 17,11% (zelena mlaznica, brzina rada od 6 km/h, norma raspršivanja od 350 l/ha te radni tlak od 10,99 bar). U nasadu jabuke navedeni odnos ostvaruje se s pokrivenošću tretirane površine od 59,55% i zanošenja tekućine od 21,10% (zelena mlaznica, brzina rada od 8 km/h, norma raspršivanja od 325 l/ha te radni tlak od 16,84 bar).

Ključne riječi: raspršivač, mlaznica, pokrivenost površine, brzina rada, norma raspršivanja

IMPACT OF TECHNICAL SPRAYING FACTORS ON LEAF AREA COVERAGE IN PERMANENT CROPS

Doctoral thesis

Researches are conducted in vineyard and apple orchard with two different types of mist blowers, axial (*Hardi Zatur*) and radial (*Hardi Arrow*). The influence of major technical spraying factors (type of nozzle, working speed and spray volume) were observed on coverage of the treated area, average droplet diameter, number of droplets per cm² and drift.

The working speed of sprayer was set at 6 and 8 km/h, and spray volume on 250, 325 and 400 l/ha for apple orchard and 250, 300 and 350 l/ha for vineyard. Researchers used *Lechler* blue (*TR 8003*), yellow (*TR 8002*) and green (*TR 80015*) nozzles. The research was set as three - factorial field experiment with 18 treatments in 4 repetitions, for different type of sprayer and permanent crops. We used 60 water sensitive papers for that treatment, which were processed with digital image analysis and *ImageJ* software. In addition to the main features of the research, research showed leaf area index and density, speed and flow of air current, working pressure, orientation of the nozzles and weather conditions, which were monitored during the study. Before the research, mist blowers are tested according to the European standard *13790*. By decreasing the *ISO* number of nozzles and by increasing the working speed and spray volume, we found increase of area coverage, number of droplets per cm² and drift, and decrease of average droplet diameter. Also, by comparing the results of research exploitation by axial and radial mist blower in the vineyards and apple orchards, better results are achieved with radial mist blower (*Hardi Arrow*) in both cases. The best relationship of area coverage and liquid drift in vineyard were achieved with 64.22% area coverage and 17.11% of liquid drift (green nozzle, working speed of 6 km/h, spray volume of 350 l/ha, and working pressure of 10.99 bar). In apple orchard the best relationship of area coverage and liquid drift were achieved with 59.55% area coverage and 21.10% of liquid drift (green nozzle, working speed of 8 km/h, spray volume of 325 l/ha, and working pressure of 16.84 bar).

Key-words: mistblower, nozzle, area coverage, working speed, spray volume

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