sloping land compared to on the level land harvesting, due to the slope, which reduced working speed by 21-33% which led to a decrease of the shift time usage coefficient to 0.51.

The fuel consumption of the TC 5050 New Holland combine obtained in maize grain harvesting on the sloping land has increased on average by 19-31% comparing to the fuel consumption obtained on the level land movement.

The work capacities and the fuel consumption average values of the TC 5050 New Holland combine can be found in table 5.

Table 5

The work capacities and the fuel consumption of the TC 5050 New Holland combine in maize grain harvesting

Specification	Symbol	M.U.	Value
Hourly work capacity on effective time	Wef	t/h	7.92
Hourly work capacity on operative time	W02	t/h	6.64
Hourly work capacity on production time	W04	t/h	6.12
Hourly work capacity on shift time	W07	t/h	5.79
Work capacity on a 8 hours shift	Wsch	t/sch	46.32
Fuel consumption per reference unit	Gc	l/t	6.37

During the experimental research, we have seen that the combine's safety is not ensured on the hill-valley movement balance facing valley, especially on slopes above 22% and when the bunker has a load over 1500 kg of grains.

CONCLUSIONS

1. The TC 5050 New Holland combine had the total grain losses below the alowable limit of 2.5% when driving on the level and just above this limit when the combine's movement was on the slope land along the contour. When driving the combine on the hill-valley, and on the valley-hill directions, the combine's total grain losses have exceeded the allowed limit, reaching values of 9.63%.

2. The percentage of broken grains was reverse proportional to the speed of the combine and has not been explicitly influenced by the slope.

3. In the experimental research, the 5050 TC New Holland combine has reduced it's work capacity by 10-25% and has increased fuel consumption by 19-31% when driving on the slope land comapring to the level land movement.

4. The time for technical fixes has immobilized the combine 29-37 min/shift on average, which drew reduction of the shift time usage coefficient to 0.51, and the operational safety coefficient to 0.83.

5. In order to achieve a quality harvest work, the combines should be adjusted and operated in accordance in accordance with land condition and with the agrobiological characteristics of the crops.

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INFLUENCE OF DETHATCHING ON TURFGRASS DENSITY

INFLUENȚA SCARIFICĂRII ASUPRA DENSITĂȚII GAZONULUI

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Abstract. *Lawns are subjected to thatch development due to dry shoots, stolons, rhizomes or clippings. A thin layer of thatch is desirable, protecting rootzone from extreme heat, but a layer thicker than 1.5 cm has a negative influence on turf, as water and fertilizer does not infiltrate as easily in soil. The aim of this study was to evaluate the effect of different types of dethatching methods on turfgrass density. The experiment was established at Ezareni farm from city of Iasi. The evaluation of turfgrass density was done using the visual rating scale elaborated by the National Turfgrass Evaluation Program from USA. The best dethatching treatment was AA+AS where the biggest differences were observed compared with control. Among varieties, the most significant changes were registered at Poa pratensis species where turf density increased in average from 6.5 to 8.1.*
Key words: lawn aerification, turfgrass quality.

Rezumat. *La suprafața solului se formează un strat de țelină datorat lăstarilor uscați, stolonilor aerieni, dar şi frunzelor tăiate prin tuns. Un strat subțire de țelină este benefic, protejând solul împotriva temperaturilor ridicate din vară, dar un strat mai gros de 1,5 cm devine dăunător, îngreunând pătrunderea apei şi a fertilizanților în sol. Scopul acestui studiu a fost de a determina efectul unor tipuri de lucrări care vizează țelina gazonului. Experimentările au fost efectuate în cadrul fermei Ezăreni din Iaşi. Evaluarea densității gazonului s-a făcut cu ajutorul scării de apreciere vizuală elaborată de National Turfgrass Evaluation Program din USA. Cea mai bună variantă experimentată a fost AA+AS unde s-au înregistrat cele mai mari diferențe ale densității comparativ cu varianta martor. Dintre soiurile de gazon, răspunsul cel mai puternic s-a observat la specia Poa pratensis, la care densitatea a crescut în medie de la 6,5 la 8,1.*
Cuvinte cheie: aerarea gazonului, calitatea gazonului.

INTRODUCTION

Lawns are subjected to thatch development which is caused by dried shoots and leaves, runners, rhizomes and clippings. A thin layer of thatch is desirable, protecting rootzone from extreme heat, but a layer thicker than 1.5 cm has a negative influence on turf, as water and fertilizer does not infiltrate as easily in soil (Christians, 2004; Dunn and Diesburg, 2004). Excess thatch is removed by superficial scarification thus allowing deep rooting with positive effects on turf growth and hardiness, also reducing the demands for irrigation (Carrow, 2003).

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Aeration and scarification equipment varies by mode. There are aerators based on water injection, which penetrate the soil to a depth of 20 cm, by means of powerful water jets. (Raturi et al., 2003). Hanna W. (2005) believes that verticutting machines can be used succesfuly to reduce thatch.

MATERIAL AND METHODS

The experiment was setup at the experimental fields in Ezareni farm from Iasi. The design used was a split plot design with three replicates. The following factors were studied:

Factor A – dethatching method:

A1 – control plot (C)

A2 – verticutting (AA)

A3 – power raking (AS)

A4 – verticutting + power raking (AA+AS)

Factor B – 19 turfgrass varieties from the following species: *Lolium perenne (L.p.), Festuca arundinacea (F.a.), Festuca rubra rubra (F.r.r.), Festuca rubra tricophylla (F.r.t.), Festuca rubra commutata (F.r.c.), Poa pratensis (P.p.), Festuca ovina duriusculla (F.o.d.).*

Turfgrass density evaluation was done using the visual rating scale elaborated by the National Turfgrass Evaluation Program from USA (Morris, 2006). Statistical interpretation of the data was done by ANOVA test.

RESULTS AND DISCUSSIONS

Turfgrass varieties have registered rather good values of density in the spring, when C and AA treatments were rated 7, while AS and AA+AS treatments were rated 7.2 and 7.3 (table 1).

Table 1

The influence of dethatching on turfgrass density (1-low density; 9-high density)

Spring				Summer				Fall				Annual average			
C	AA	AS	AA AS	C	AA	AS	AA AS	C	AA	AS	AA AS	C	AA	AS	AA AS
7.0^{Mt}	7.0	7.2	7.3*	6,2^{Mt}	6,6**	7,0***	7,2***	6,6^{Mt}	6,6	7,5***	7,5***	6,6^{Mt}	6,7	7,2*	7,4**
LSD 5% = 0.3 LSD 1% = 0.4 LSD 0.1% = 0.6				LSD 5% = 0.2 LSD 1% = 0.3 LSD 0.1% = 0.5				LSD 5% = 0.1 LSD 1% = 0.2 LSD 0.1% = 0.4				LSD 5% = 0.5 LSD 1% = 0.7 LSD 0.1% = 1.1			

In the summer we observed different effects among dethatching treatments, the most efficient was AA+AS where density was rated 7.2, followed by AS which was rated 7, AA rated 6.6 and C rated 6. In the fall AS and AA+AS treatments had the best results rated 7.5 while AA and C registered lower densities being rated with 6.6.

Comparing turfgrass varieties response to dethatching we observed a varied effect of treatments, some of these varieties reacted better to aerification and some reacted poorer (table 2). Among varieties with better results we can mention Capri, Ponderosa and Esquire which belong to *Lolium perenne* species, Rosita, Calliope, Celianna and Maxima 1 belonging to *Festuca rubra* species, Panduro and Conni belonging to *Poa pratensis* species.

Table 2

The interaction between dethatching method and variety on turfgrass density (1-low density; 9-high density)

Turfgrass varieties	Spring				Summer				Fall				Annual average			
	C	AA	AS	AA AS	C	AA	AS	AA AS	C	AA	AS	AA AS	C	AA	AS	AA AS
Mara	6.0[C]	6.7	6.0	6.0	3.7[C]	4.0	4.3	4.3	4.7[C]	5.0	5.3	5.7**	4.8[C]	5.2	5.2	5.3
Margarita (*L.p.*)	7.0*	7.3**	7.3**	7.3**	6.3***	7.0***	6.3***	6.3***	6.3***	6.3***	7.0***	7.0***	6.5**	6.9***	6.9***	6.9***
Capri (*L.p.*)	6.7	6.3	6.3	6.3	5.3**	5.3**	6.3***	6.0***	5.0	5.0	6.0***	6.0***	5.7	5.5	6.2*	6.1*
Ponderosa (*L.p.*)	6.7	7.0*	7.3**	7.3*	5.3**	5.3**	6.0***	6.0***	5.3	5.3	6.3***	6.3***	5.8	5.9	6.5**	6.5**
Esquire (*L.p.*)	7.7***	7.0*	7.7***	7.7***	5.7***	5.7***	6.3***	6.3***	6.0***	6.0***	7.0***	7.0***	6.5**	6.2*	7.0***	7.0***
Keystone (*L.p.*)	7.3**	6.7	7.7***	7.7***	6.0***	6.3***	6.7***	7.0***	7.0***	7.3***	7.7***	7.7***	6.8**	6.8**	7.4***	7.5***
Rosita (*F.r.t.*)	6.0	6.0	6.7	6.7	6.7***	6.7***	7.3***	7.3***	6.3***	6.3***	7.7***	7.0***	6.3*	6.3*	7.2***	7.0***
Smirna (*F.r.t.*)	6.7	6.7	6.7	7.0*	6.0***	6.0***	6.3***	6.3***	6.7***	7.0***	7.0***	7.0***	6.5***	6.6**	6.7**	6.8**
Calliope (*F.r.c.*)	8.0***	8.0***	8.0***	8.0***	5.3**	6.0***	6.3***	6.7***	7.0***	7.0***	8.0***	8.0***	6.8**	7.0***	7.4***	7.6***
Celianna (*F.r.r.*)	6.7	7.0*	6.0	6.0	6.3***	6.3***	7.7***	8.0***	6.0***	6.0***	7.0***	7.0***	6.3*	6.4**	6.9***	7.0***
Legende (*F.r.c.*)	7.0*	7.0*	7.0*	7.3**	6.3***	6.7***	6.3***	7.0***	8.0***	8.0***	9.0***	9.0***	7.1***	7.2***	7.4***	7.8***
Capriccio (*F.r.c.*)	8.0***	8.0***	8.0***	8.0***	8.0***	8.0***	8.3***	9.0***	7.0***	7.0***	8.0***	8.0***	7.7***	7.7***	8.1***	8.3***
Maxima 1 (*F.r.r.*)	5.7	5.7	6.0	6.3	6.7***	6.7***	7.7***	7.7***	6.0***	6.0***	7.0***	7.0***	6.1*	6.1*	6.9***	7.0***
Dumas 1 (*F.o.d.*)	7.0*	7.0*	8.0***	8.3***	6.0***	6.7***	7.0***	7.7***	7.7***	7.7***	8.7***	8.7***	6.9***	7.1***	7.9***	8.2***
Monserrat (*F.a.*)	7.0*	7.0*	6.7	7.3**	6.7***	7.0***	7.7***	8.0***	8.0***	8.0***	9.0***	9.0***	7.2***	7.3***	7.8***	8.1***
Starlett (*F.a.*)	7.0*	7.0*	7.0*	7.0*	8.0***	8.7***	8.3***	8.7***	8.0***	8.0***	9.0***	9.0***	7.7***	7.9***	8.1***	8.2***
Panduro (*P.p.*)	6.7	6.7	7.0*	8.0***	7.0***	8.0***	8.3***	8.7***	5.7**	5.7**	6.7***	6.7***	6.5**	6.8**	7.3***	7.8***
Conni (*P.p.*)	7.7***	7.7***	8.0***	8.7***	5.7***	6.3***	7.7***	7.7***	6.0***	6.0***	8.0***	8.0***	6.5**	6.7**	7.9***	8.1***
Penn G6 (*A.s.*)	8.7***	8.7***	8.7***	8.7***	7.3***	8.3***	8.7***	9.0***	8.0***	8.0***	9.0***	9.0***	8.0***	8.3***	8.8***	8.9***
LSD 5%	0.9				1.0				0.6				1.2			
LSD 1%	1.2				1.3				0.8				1.6			
LSD 0.1%	1.6				1.7				1.0				2.0			

A poorer reaction to dethatching has been observed at Mara and Margarita varieties (*Lolium perenne*), Smirna variety (*Festuca rubra*), and Starlett variety (*Festuca arundinacea*). Some turfgrass varieties did not benefit from aerification immediately after the treatments were performed. But the effect was visible after two or three months. For example the Capri variety had a better density in the spring at control plot (6.7). The dethatching treatments resulting in a slightly loss of density for all three treatments (AA. AS and AA+AS) rated 6.3. In the summer however, AS treatment registered the best density (6.3) while the control plot was rated only 5.3. A different case was the one of bluegrass varieties Panduro and Conni, which benefited right after the aerification treatments were applied in the spring. Panduro variety had a spring density at control variant rated 6.7 and 8.0 at AA+AS. The species *Agrostis stolonifera* benefited the most in the summer when it registered the biggest difference between control (7.3) and AA+AS treatment (9.0).

CONCLUSIONS

1. The best dethatching treatment was AA+AS that produced the best turfgrass density compared with control plot.
2. The highest difference between aerification treatments and control plot was observed in the summer at the treatment AA+AS rated 7.2 while the control plot was rated only 6.2.
3. Among turfgrass varieties the strongest reaction to aerification was observed at *Poa pratensis* varieties. where density increased from 6.5 to 8.1.

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