RESEARCH REGARDING THE WATER COMSUMPTION ON THE PRODUCTION OF RED CLOVER

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Abstract

Red clover is one of economically recovered water conditionsit it is grown in specific ecological areas .The water consumption on the production of red clover is 500 - 700mm / year maximum being the months from July to August when consumed 4.5 mm / day. However not support excess water and is susceptible to ponding.

Key words: water consumption, recovered, red clover, ponding

INTRODUCTION

Due to climate change in recent years, they have deepened research for a better understanding of plant biology fodder, and the results have led to the development of intensive technologies differentiated ecological zones. So, in terms of knowing the water consumption of the plant is particularly important use of coefficients Kc established on the basis of consumer data optimum water specific to each culture which will determine the precise determination of when the application splashing and finally efficiency superior irrigation in terms of soil protection. (Domuta 1995, 200,2003)

MATERIAL AND METHOD

The research was conducted during 2011 - 2015 under an experimental field of luvosol Research Station - Oradea Agricultural Development. The soil has a degree of structuring (47.5%); Total porosity is the middle and lower 0-60cm depth. The depth of 0-75cm soil watering red clover has a capacity of middle field (25%) and a coefficient of wilting (11%) and the minimum limit was set at 2/3 of useful water capacity due to bulk density - 1,41g / cm3. The soil is slightly acidic reaction, poorly supplied with humus, low-middle stocked with humus, poorly-stocked with total nitrogen, phosphorus stocked. Fertilization system was N_{200}, P_{150} and K_{100} kg / ha, the variety used Select. In order to maintain the minimum level of the depth of field and the ability of o-75 cm were sampled from the ground of 15 to 15 days. The water consumption was calculated by the mass

balance of water in the soil. Specific consumption clover is 500-700 mm / year, the maximum being the months from June to August, when consumed 4-5 mm / day. It is estimated that 1 mm rainfall produces 21-22 kg dry or green mass 100 kg (8). Crops sown in late summer watering is applied emergence of 300-350 m^3 / ha. In dry autumns requires that after 7-8 days to apply a watering 350-400 m^3 / ha. During vegetation should be watered every 10-12 days in months July-August and 15-18 days in May-June, outside the rainy periods, with standard 600- 650 m^3 / ha on the chernozem and alluvial soils and 500-550 m^3 / ha on other types of soils.

RESULTS AND DISCUSSION

Research carried out in the south under irrigation on chernozems, showed that red clover economically recovered water coefficient of sweating being 400-550 so lower than that of alfalfa In these areas, it is desirable to cultivate red clover especially in depressions where water regime is more favorable, and chernozems whose pH exceeds 7.8 (Marusca, 2001). Red clover is sensitive to excess water, especially by ponding. Water in excess biologically active soil layer leads to destruction of symbiotic bacteria and thinning plants, which contribute to the emergence of specific diseases. Research undertaken Fundulea house vegetation that reveal stagnation depressant effect of water on the soil surface is directly proportional to the time of flooding, but also with the growing phase in which this phenomenon occurs; spring, immediately after starting the plants in vegetation, water stagnation on the soil surface for 3-9 days resulted in reduced root system with a vegetative mass from 7.6 to 20.3% and 39.8% 17,4- aerial. Maximum depressant effect occurred when the plants were immediately flooded after mowing or after 8 days. In the flooding conditions for the destruction of 3-6 days up to 90% of the root system, and the vegetative mass of air, up to 77%; when the flooding period was 9-12 days the plants were completely destroyed (Moga et al., 1983, Moga 1993, Resmerita et al., 1973). When red clover grown in mixtures with perennial grasses under irrigation, nitrogen dose may be up to 80-90kg N (Moga et al., 1996, 200, 2005)

Red clover recovered water of irrigation water by 1 mm^3 occur 20-22 kg of dry matter. Under favorable conditions of humidity, year of vegetation, red clover gives the highest productions when all scythes, harvesting is done during the flowering phase and in subsequent years when harvesting is done in the middle of the flowering phase growth production is higher by 50-60% compared to the situation in which the plants were

harvested before budding phase; when red clover grown in mixtures with perennial grasses, scythe I harvested early phase bellows of grasses and scythes next mid flowering phase of red clover (Moga et al, 1983, Moga, 1993, Moga et al., 1996)

In order to maintain the water supply between the minimal and the field capacity in the depth of 0-75cm over the period studied was used for a rule of irrigation 2750 m3, and the average number of watering was 6.

Table 1

Regime irrigation water required to maintain reserve the soil water supply between minimum and field capacity on 0-75cm in red clover (2 $^{-and}$ year), 2011 - 2015

Specification	IV	V	VI	VII	VIII	IX	X	
	∑m n	∑m n	∑m n	∑m n	∑m n	∑m n	∑m	n
Minimum value	0 0	0 0	0 0	0 0	400 1	0 0	1100	3
Maximum value	850 2	1350 3	1350 3	1580 3	1450 3	500 2	4550	12
Average	15 1/2	450 1	450 1	650 2	750 2	250 1	2750	6

∑m – Irrigation norm m^3/ha
n - the number of waterings

Irrigation increased the daily water consumption biggest difference recorded in August (50 m^3 / ha / day). In descending order relative differences in other months were 50% in July and August, the maximum daily water consumption recorded was in July both in irrigated and at unirrigated.

Table 2.

The irrigation influence on daily water comsuption in red clover culture (2 $^{-and}$ year), 2011 – 2015

Variant	IV	V	VI	VI	VIII	IX
	m^3/ha/day %	m^3/ha/day%	m^3/ha/day %	m^3/ha/day %	m^3/ha/day %	m^3/ha/day %
Unirrigated	25,0 100	35,0 100	34,9 100	35,0 100	28,5 100	22.0 100
Irrigated	27,0 103	40,0 117	44,5 135	50,0 145	50,0 200	32.0 150

Total water consumption of red clover in unirrigated crop was 4050 m3 / ha, and under optimal water supply carried by irrigation, the average consumption was 6550 m3 / ha. The relative difference between the average water consumption of red clover in crop irrigated and non-irrigated water consumption of culture is 49%, the range is between 25 and 125% (Table 3).

Table 3.

The irrigation influence on the total water consumption in red clover culture (2 $^{-and}$ year),2011-2015

Variant	Average		Variation interval	
	m^3/ha	%	m^3/ha	%
Unirrigated	4050	100	3500 - 6500	100
Irrigated	6550	149	5073 - 7708	125 - 225

For unirrigated crop of red clover source of coverage in water consumption was the rainfall during the growing of this crop, the average amount being studied by 283.7 mm, representing approximately 67.9% of total water consumption. The irrigated crop of red clover average water consumption was 6550 m3 / ha, rainfall during the survey period covering approximately 50% of this reserve and soil were used by 27.2% less than non-irrigated crop. by irrigating the crop increased production of green mass by 47% more than the culture unirrigated between total water consumption of red clover in two cultures there is a direct correlation between the 5 types of regression tested (linear, logarithmic, polynomial, exponential and power)

Table 4.

Covering sources of the total water consumption in unirrigated and irrigated red clover culture (2 $^{-and}$ year),2011-2015

Variant	Total water consumption m^3/ha	Soil water reserve m^3/ha	%	Rainfall (Rv) Average	%	Variation interval	∑m Average	%	Variation interval
Unirrigated	4050	1105	27.2	2735	67.9	25-125	-	-	-
Irrigated	6550	665	10.0	2735	41.75	20-90	2750	35	15-75

∑m – irrigation rata m^3/ha Rv – rainfall during the vegetation period of red clover

CONCLUSIONS

Periodic determinations of soil moisture showed that maintaining water reserve between the minimal and field capacity on 0-75 cm depth of irrigation was needed every year, part of irrigation being 2750m3 / ha.

The relative difference between the average water consumption of irrigated and non-irrigated red clover is 49%.

Daily water consumption of red clover in crop irrigated increased by up to 100% in August compared to the culture coverage neirigată.Principala source of total water consumption of red clover were a recorded rainfall during the growing period thereof (67.9%).

Improving water consumption by irrigation led to increased production of red clover by 50% and by the direct correlation between water consumption and irrigation opportunity shows yields of this crop in the second year of use especially in the Cris Plain.

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