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Yield and quality of Italian ryegrass as affected by supplemental irrigation

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Introduction To achieve the highest yields, ryegrass requires watering when rainfall is not enough to cover its needs. Biannual varieties might be able to extend the growth period as compared to the annual, but this needs to be tested in the field.

Material and methods A study was conducted in 2005/06 applying the following treatments: rainfed, and irrigation up to 25%, 50% and 100% of soil water holding capacity. Two varieties were tested, one annual (Pollanum) and the other biannual (Lipo). A sprinkler irrigation system was used. Planting date was October 17. After harvests, 50 kg/ha of nitrogen were applied.

Results and discussion Water application increased dry matter yield values (Figure 1), as compared to the rainfed treatments. Irrigated annual ryegrass (Pollanum) tended to be higher yielding than the biannual, especially at the 25% treatment. Under rainfed conditions, Lipo showed better results. For Pollanum, Lourenço e Palma (2001) reported higher values as well as Jung and Shaffer (1992) for Lipo. The results for crude protein and digestible dry matter content are presented in Table 1.

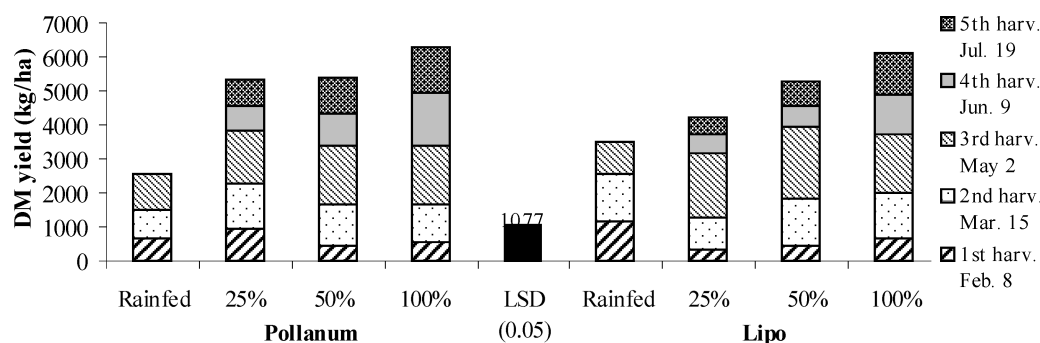


Figure 1 Total dry matter yield by ryegrass variety and watering regime.

Table 1 Crude protein (CP) and dry matter digestibility (DMD) by harvest and irrigation treatment.

Harvests	Crude protein (g kg ⁻¹)				Digestible dry matter (g kg ⁻¹)			
	25%	50%	100%	Mean	25%	50%	100%	Mean
1st	17.5	14.5	12.4	14.8	837.6	835.0	833.5	835.4
2nd	18.3	18.1	18.8	18.4	812.4	813.1	808.3	811.3
3rd	15.1	14.5	15.3	15.0	740.5	767.3	897.1	801.6
4th	14.4	13.9	15.1	14.5	538.3	562.8	619.0	573.3
5th	11.6	13.0	11.9	12.2	514.3	532.6	585.5	544.1
Mean	15.4	14.8	14.8	15.0	668.6	702.2	748.7	713.1

LSD (0.05) for CP: irrigation treatment × harvest = 1.3; for DMD: irrigation treatment = 45.4, harvest = 46.8

Conclusions The results showed that under rainfed conditions, the biannual variety Lipo achieved greater yields. Under irrigation treatments, the Pollanum variety showed better water use efficiency especially at the 25% treatment. The forage produced in this study was good, even though a decrease in crude protein was noticed after the second harvest, and in dry matter digestibility after the third.

References

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