2019 EGF EUCARPIA

Joint Symposium | Zurich, June 24–27

Improving sown grasslands through breeding and management

Edited by

O. Huguenin-Elie
B. Studer
R. Kölliker
D. Reheul
M. Probo
P. Barre
U. Feuerstein
I. Roldán-Ruiz
P. Mariotte
A. Hopkins

EUCARPIA

EGF

Volume 24
Grassland Science in Europe

Improving sown grasslands through breeding and management

Proceedings of the Joint 20th Symposium of the European Grassland Federation and the 33rd Meeting of the EUCARPIA Section 'Fodder Crops and Amenity Grasses'

Zürich, Switzerland
24-27 June 2019

Edited by
O. Huguenin-Elie
B. Studer
R. Kölliker
D. Reheul
M. Probo
P. Barre
U. Feuerstein
I. Roldán-Ruiz
P. Mariotte
A. Hopkins

Published by

Organising Committee of the Joint 20th Symposium of the European Grassland Federation and the 33rd Meeting of the EUCARPIA Section 'Fodder Crops and Amenity Grasses', Agroscope, Reckenholzstrasse 191, 8046 Zurich, Switzerland.

ISBN: 978-3-033-07278-7
eISBN: 978-3-033-07279-4

Editing and production by

Wageningen Academic Publishers
P.O. Box 220
6700 AE Wageningen
The Netherlands
www.WageningenAcademic.com

Distributed by

European Grassland Federation EGF
W. Kessler, Federation Secretary
c/o Agroscope
Reckenholzstrasse 191
8046 Zürich, Switzerland
E-mail: fedsecretary@europeangrassland.org

Effect of irrigation on forage yield of grass-legume mixtures in a summer-dry mountain region of Switzerland

Blunier G., Ineichen S., Kopp C. and Reidy B.
School of Agriculture, Forest and Food Sciences HAFL, Bern University of Applied Sciences, Laenggasse 85, 3052 Zollikofen, Switzerland

Introduction: Climate scenarios for Switzerland predict decreased summer precipitation, potentially affecting grassland productivity and management. Knowledge about the effects of irrigation is crucial in order to address the expected changes for grassland management. The objective of this field study was to determine the influence of irrigation on different official grass-legume mixtures for leys in a mountain region with summer dryness in Switzerland.

Materials and methods: The two-year field experiment was conducted in Domleschg (GR) at 840 m a.s.l. on an organic farm. Official grass-legume mixtures (SM 301, 323, 330, 442 and 450; Suter *et al.* 2017), varying in grass- and legume species composition, were established in a randomized complete block design with four repetitions. Irrigation treatments consisted of either 'non-irrigated' plots which received water by precipitation only or 'irrigated' plots with additional water supplied by drip irrigation. Fertilization was applied in early spring as cattle slurry in amounts that supplied N at a rate of 65 kg N ha^{-1}. Plots were cut four times per year. Data were analysed using a linear-mixed-model in R.

Results: With precipitation of 741 mm in 2015, the annual dry matter (DM) yield in non-irrigated plots was on average 122 dt ha^{-1}. Irrigation (+511 mm) increased the DM yield on average by 32.4 dt ha^{-1} (P<0.05). Significant differences in DM yield between the irrigation treatments were mainly observed for cuts 2 and 3 during the dry summer months from June to August (Figure 1). The highest yield increase due to irrigation (+48%) was found for mixture 442 based on tall fescue. Yield differences were least pronounced for mixture 323 based on lucerne. Irrigation had a strong impact on the grass-legume composition of individual mixtures (data not shown).

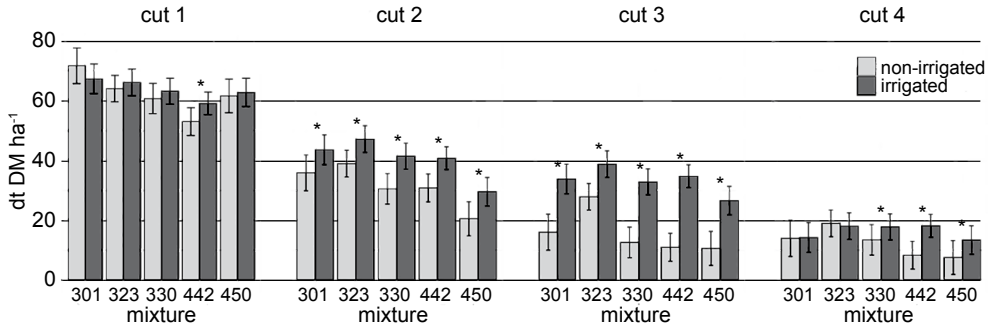

Figure 1. Average dry matter yield of individual cuts of official grass-legume mixtures, irrigated or non-irrigated (mean ± SEM). Asterisks indicate a significant difference at P<0.05.

Conclusion: The results indicate that irrigation increased the DM yield significantly, due mainly to higher dry matter yields in cuts 2 and 3 during the dry summer months. Individual mixtures show a species-dependent DM yield response to irrigation.

Suter D., Rosenberg E., Mosimann E. and Frick R. (2017) Standardmischungen für den Futterbau Revision 2017-2020. *Agrarforschung* (8), Supplement.