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**Evaluation of Vetch and Barley intercropping under
dryland farming as affected by Azetobarvar-1 and
Superabsorbent material**

Supervisors:
E. Khammari
A.R. Sirousmehr

Advisors:
M. Daneshvar
M. Galavi
M. Dahmardeh

By:
Norollah Toolabi

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Abstract

Due to the importance of forage plants for livestock nutrition and lack of crop production, a two-year experiment to evaluate the ecophysiological evaluation of mixed cultivation of vetch and barley in rainfed conditions, under the influence of Azotobaror-1 biofertilizer and Superabsorbent material during crop years (2017-2018 and 2018-2019) in the research farm of the Faculty of Agriculture of Lorestan University was performed in a factorial 4×5 based on a randomized complete block design (RCBD) in three replications. The first factor (mixed cultivation) in 5 levels as follows: V1= vetch monocropping (100% vetch), V2= Barley monocropping (100% Barley), V3= intercropping (75% vetch + 25% Barley), V4= intercropping (50 % Vetch + 50% Barley) and V5= intercropping (25% vetch + 75% Barley) were considered by alternative method. The second factor (combination of biofertilizer and superabsorbent material) was designed in 4 levels including: F1= Azotobar-1 (seed inoculation and foliar application), F2= Superabsorbent, F3= Azotobar-1 + Superabsorbent and F4= control (no Fertilizer and Superabsorbent). The results showed that in the flowering stage, fresh and dry forage yield, Protein percentage and forage protein yield, Competitive characteristics of forage, gas exchanges and the number and dimensions of the stomata on the upper and lower surface of vetch and barley, On the other hand, in the final harvest stage, yield and Seed yield components, percentage protein and seed protein yield, biological yield and harvest index of vetch and barley in intercropping were affected by biofertilizer Aztoborvar-1 and superabsorbent material. In this experiment, 50% of vetch + 50% of Barley was introduced as the best treatment combination for forage and grain production in the test area, so that the share of vetch in coexistence with Barley was effective in production, from On the other hand, the combination of Azotobaror-1 biofertilizer as a reliable alternative to nitrogen-containing chemical fertilizers and superabsorbents with the ability to store rainwater, especially at the end of the growing season, could not only increase quantitative and qualitative performance, but also play an important role in sustainable agriculture. Healthy production should act as the best solution in rainfed and rainy areas.

key words: *Yield, Crude protein, seed inoculation, Foliar application, Competitive indices, Sustainable agriculture.*