عنوان مقاله:

Water Productivity and Virtual Water of Barley Cultivars under Different Irrigation Regimes

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خلاصه مقاله:

To remain viable in facing with increasing costs, farmers need to increase irrigation Water Productivity (WP) and save Virtual Water (VW). To evaluate the WP and VW for five barley cultivars (Reyhan, Nimrooz, Valfajr, Zehak, and Yusof) under different irrigation regimes [well-watered (۱۰۰% Field Capacity; FC), mild water stress (۷۵% FC), severe water stress (۵۰% FC), and extremely severe water stress (۲۵% FC)], a two-year field experiment was laid out in Darab, Fars Province, Iran, during ۲۰۱۴ and ۲۰۱۵ growing seasons. Results showed that change in moisture stress from well-watered to extremely severe water stress, was associated with a significant increase in WP and Economic Water Productivity (EWP) for straw and biological yield. A positive linear relationship was found between grain yield and VW, and the lowest VW was found in the range of ۳,۳۱۴ to ۳,۴۵۱ kg ha-۱ of grain yield. Interestingly, for all irrigation regimes, Zehak and Yusof cultivars had greater WP for the grain yield. Furthermore, VW for biological yield of Yusof cultivar sharply decreased from ۰.۴۱۰ m۳ kg-۱ in well-watered treatment to ۰.۱۶۴ m۳ kg-۱ under extremely water stress conditions in both years. Comparison of Zehak and Yusof cultivars with Reyhan, Nimrooz and Valfajr showed that under water stress conditions, the first two cultivars showed significantly lower VW for the grain yield than the other cultivars. Indeed, Yusof and Zehak cultivars showed the lowest Economic Virtual Water (EVW), which was in the range of ۰.۰۵۴ to ۰.۰۹۱ m۳ ۱,۰۰۰ Rials-۱, under extremely water stress conditions. Thus, to achieve optimum EWP and EVW and attaining stable yields under semi-arid conditions, suitable barley cultivars such as Zehak and Yusof could be irrigated with less water (i.e. ۲۵ to ۵۰% FC).

کلمات کلیدی:

.Biological yield, Economic virtual water, Water productivity of grain yield, cv. Yusof, cv. Zehak

لینک ثابت مقاله در پایگاه سیویلیکا: