

Abstract:

As a consequence of development, increasing energy consumption in agriculture has led to agricultural instability. One of the most useful methods in analysis and evaluation of agricultural sustainability is the use of energy as a means of calculation. The present study was carried out in the Sistan region, 2014-2015 to estimate energy efficiency and productivity in wheat and watermelon. The results showed that in both crops, the highest energy consumption belonged to chemical fertilizer (especially nitrogen). The results also showed the highest energy efficiency (ratio) was observed in large wheat farms (higher than 3 ha) or in average- size ones (3.2) and the lowest energy efficiency belonged to watermelon in small or average- sized farms (-41.27). The results of optimizing energy efficiency using linear programming model showed that using the same amount of inputs, but with better and more efficient management and optimal use of resources, farmers could increase wheat and watermelon yields by 40.7% and 41.27%, respectively, in average- sized farms of the region. Likewise, by reducing the energy input to the system of wheat and watermelon production, the current levels of productivity will reduce by 33.3% and 41.2% on average farms. To improve energy indices used in production of wheat and watermelon in the Sistan area, it is proposed to hold effective informative classes for farmers to equip them with the correct procedures of consumption and handling the machines.

Keywords: linear programming, productivity, efficiency, wheat, watermelons



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