Feasibility study of cultivation cotton in Khuzestan province

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Introduction

Between different factors, atmosphere conditions are most important natural factors which affect the agricultural crops production. One can observe these effects as frost, sunstroke, outbreak of pest and etc. At the moment, agriculture is one of the most important sections in the economy of a country. In fact, one can say that economic growth is impossible without agriculture. Agricultural crops growth is widely dependent to the atmosphere conditions. Light, temperature, co_2, water and nutrients are controlled by the atmosphere. Cultivation of crops in sites with compatible conditions for them has two results. First, it produces the maximum profit and efficiency for farmers. Second, it causes the least damage to the agricultural resources during the long time. Now, as a result of new inventions, cotton includes 48 percent of loom productions. Assessments indicate that producing of cotton in the country provides only half of the country needs at the present time. Therefore, imports of cotton bring out a lot of money from the country each year. The main objective of this study is assessment of environmental and climatic conditions of Khuzestan province according to the cotton needs in order to investigation of the existence and non-existence of potential of cotton planting as a significant product at this province.

Material and methods

First, beginning and end of cotton cultivation date was determined regarding to the climate of Khuzestan province and necessary condition for cotton, on the basis of 90% possibility. To do so, the daily precipitation and temperature data from synoptic station of Khuzestan province which had long-term data (20 years) were used. Then, the important environmental and climatic conditions of cotton cultivation were identified

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according to the scientific references. Next, for studying the compatibility rate of each factor, a map was prepared separately in Geographical Information System. So, 11 factors were used for cotton planting and their GIS maps were provided. For providing climatic maps, data from 6 well-scattered synoptic stations were used. Finally, with run of Query at GIS by using eternal Boolean Model, suitable areas for cotton planting across the Khuzestan province were exploited and at the next stage, the Topsis Model was used in order to privileging selected areas.

Result and Discussion

According to the analysis, 31 March and end of September and October were determined as the beginning and end of cotton planting date, respectively. From the analysis of the factors which were applied following conclusions were drawn:Suitable degree-day for cotton planting is accessible in whole of the province. Temperature of germination is between 26-28 °C in this province and so provides the cotton thermal need in this period. Temperature of flowering is only provided in North-West of province. Also, temperature of harvest month has no limitation for cotton planting. Cloudiness during the planting period is less than 2.5 Octa which indicates the suitability of this factor for cotton planting. Sunshine hours are completely provided, too. Humidity of harvest month is a limitation for cotton planting in the province, since it is only provided in the West of province. Precipitation of harvest month is zero which produces appropriate conditions for cultivation. Slope factor is suitable only in the Central and West of province. All of places in the province have suitable height for cotton planting except some regions in the North and North-East of province.

Conclusion

Between the necessary factors for complete the cotton planting period in the Khuzestan province only two factors cause limitation: humidity of harvest month and temperature of germination but other factors are appropriate for cotton planting. The results revealed that Khuzestan province with 280000 hectare of apt lands for cotton planting is one of cotton cultivation poles in Iran and can help to remove the inner needs to cotton. These lands are located in the North-West of province in the Safi Abad and Bostan Townships. Also, the privileging of the selected areas indicated that southern regions are more appropriate for cotton planting in comparison with northern regions. So attention to cultivation of cotton is urgent in this province, regarding to needs of Iran and potencies of Khuzestan province in field of cotton cultivation.

Keywords: Cotton, Khuzestan Province, Boolean Model, Topsis model, GIS.