

Evaluate the possibility of wheat Culvation of Climate condition in the village Baghmalek township (case study: Abul Abbas village)¹

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Received: April 6, 2015

Accepted: June 17, 2015

ABSTRACT

The efficiency of agriculture production is largely related to climate condition. The studying of climate conditions affects on the amount of agricultural products and can help effectively in choosing the best plant species to cultivate. The biggest problem in today agriculture meteorology is the impact of climate factors on products and growth of plant relies on all factors which create an environment. According to mentioned points, agricultural plans should be based on scientific principles such as climate economic condition of area. Neglecting above conditions can hurt agricultural products and may result in wasting of investment and decreasing efficiency of resources.

Planting of wheat in this region has benefits: preventing of earth erosion, planting improper lands for planting agricultural plant, persons. Government and related organizations should encourage persons to plant of wheat in this region with proper planning and informed them to wheat also this organizations should give bank facilities that is paid in long time and recognizing at regions to plant this worthy.

Study method is descriptive survey. Study sample size was selected according to simple random sampling method from Abulabbas village region, which were 368 persons from same residents and Villagers. Data collection tool was researcher made questionnaire. Number of studied villages were 10 villages which the criteria to select them was according to situational sampling. This information is then processed by Spss software. The criteria to select village were in 368 forms: first, having relative distribution in whole Baghmalek township so that the possibility to study would exist. Second, Abul Abbas village which were suitable in terms of potential and capacity (climate) to cultivate wheat plant. In village, the snowball sampling method was used to select wheat planting farmers.

By considering climate, study results show that because of similarity of climate condition of Baghmalek township in terms of temperature, rainfall and climate patterns table. Baghmalek township is suitable to cultivate and develop Wheat gardens.

KEYWORD: Wheat Culvation, Climate condition, village Baghmalek township, Abul Abbas village.

1-INTRODUCTION

Wheat plant is resistant to dryness and also 8 gram salt in 1 liter water in irrigation and can bear up to 10 gram in soil and 2 gram salt in 1 Kg soil. Wheat grows well in temperate and semi temperate climate and can bear the temperature of -2 to -3°C and when the degree is lower than -3°C it will face with frost bite and damages. The amount of annual rainfall should be between 375-875 mm and the optimal amount is between 250-1750 mm.

Khoozestan province considers as fit area to cultivate Wheat. Among the cities of province, Wheat was cultivated in village Baghmalek township for years which situated in the north east of Khoozestan province (Yoosefi, 2007:105).

However, in present conditions most of old and traditional Wheat field, although covers wide areas, are marginalized and changed in the form of limited areas and have not significant economic efficiency (Tamoradi et.al, 2009:210).

¹ This article was extracted from M.A thesis (Sadegh Doosalivand, Student Of Islamic Azad University, Ahvaz branch) titled "Survey capabilities wheat cultivation improvement in the rural economy- Case Study: Abolabbas Village -Baghmalek Township" to (Abbas Maroofnezhad, Ph.D. Assistant Prof, Department of Geography, College of Geography, Mahshahr Branch, Islamic Azad University, Mahshahr, Iran)

2- Study background:

According to the theory Chaturvedi: since the main purpose of Wheat cultivation is preparing a strategic product with best quality and suitable and non competitive price ,the maintaining and making usable the traditional Wheat cultivation and change them into modern and today cultivating system, Like other agricultural lands should be done so that the Wheat ,are applied in such a way that Wheat planting are able to harvest, from each hectare of Wheat, up to 15 times than 1 hectare, at the same condition.

Tombesi (1996) in the study about Wheat requirements resulted that this plant conforms with various soils and shows more tolerance against salinity of soil rather than other Plants. Khodabanda (1995) Wheat the production line in all parts of the world indifferent climates, it is possible that the wheat until 30° 60° north latitude and 27° 40° south latitude to arable.

Study results of Klein Maggie Blyth (1994) shows that Wheat can adjust with various soils and can grow even in salt soils. Wheat is resistant to dehydration and the amount of required water depends on the type of Wheat, soil, climate of area and the amount of rainfall. In gravel and clay, soils and the soil which has lower organic matter and also in areas which constantly faced with warm and dry climate, more amount of water is necessary. Annual consumed water is about 5000-6000 m³ per hectare (Ha) , but , it should be consider that in early years of cultivation , the need to water for plant is more and during irrigation , water should percolate about 1 m in soil . Yunsu (2003) resulted that Wheat plant has no sensitivity to the amount of evaporation and transpiration lower than 5 mm, but, if the evaporation and transpiration achieve more than this degree, the plant will need dehydration. Water management plays important role in plant growth.

In research of Bianchini and Francesco (1974), it is mentioned that Wheat plant can grow in soils which drained completely and PH is about 8.5 and have little salt and in warm and dry summers need more irrigation. Wheat is high resistance against high temperatures because it has very active roots which exploring the soil deeply and laterally to achieve water.

The amount of water to irrigate one hectare of Wheat changes in terms of soil type and the amount of annual rainfall and in different soils from 6000-7500 m³ is sufficient for 1 hectare Wheat cultivation. In areas which the annual amount of rainfall is 400 mm, irrigation in dry months will be need only in summer (Arabi Bikurdi, 2005:12).

If in cultivating Wheat, all agricultural operations and conditions will be considered and perform in mechanized and wide area, increase amount of products higher than 10 ton is not unexpected (Bazrafshan, 2006:44). The most important factor of final quality of Wheat variety or type (Panelli, 1994:378).

3-STUDY METHODOLOGY

Since any geographical research was not performed in philosophic space, will be considered based on philosophic theory, the main approach of present research, is based on realism theory or orientation to review current situation. This study methodology is descriptive – analytical and sample size were selected from village of area by simple random sampling method which were 368 persons from natives and residents Abulabbas village of was Baghmalek township.

The criteria to choose village was in 2 forms: first, having relative distribution in whole Baghmalek township so that the possibility to study would exist. Second, village which were suitable in terms of potential and capacity to cultivate wheat plant. In each village, the snowball sampling method was used to select wheat planting farmers.

4-Inferential results of study

4-1: climate feasibility of area to cultivate wheat:

In studying the climate feasibility of cultivating wheat in region, meteorology and climate information of Baghmalek township such as rainfall, temperature data (min and max average of monthly temperature and monthly average temperature), sunny hours, relative humidity, evaporation and agrology by means of synoptic station based on at least 10 years statistical period (2002-2011) were considered. Generally, effective climate criteria in planting wheat planting and the methods to study which are considered in this study are:

4-1-1-Temperature:

One of the features of plants chemical reaction is their sensitivity to temperature. Temperature is one of the most critical elements of plants physical environment and have important impact on their growth, geographical distribution and even their residues. All plants such as wheat plant need certain temperature in order to begin life, growth and evolution. Therefore, studying average monthly temperature, minimum and maximum to define plant temperature adjustment with environment is necessary. Metabolic processes begins by certain temperature and increases by its increasing up to temperature called optimum temperature. In addition, by increasing temperature up

to optimum amount, the metabolic activity decreases and will stop in temperature called maximum temperature. Each plants have its min and max temperature and when temperature go beyond this amount, plant life activity will stop(Jasbersing,2000:107).

Studying monthly temperature in related area shows that from November, the temperature decreases and in Jan and Feb is in its minimum level and this decreasing of temperature continues up to Mars and then from Apr , the temperature increases. In Jul and Aug, the temperature is in maximum level and this circle repeat again. In table (1),the average of monthly temperature changes in Baghmalek township during 10 years period (2002-2011) was shown.

Wheat growth period begins from spring (April) which is called spring awakening. This growth process continues up to winter which consist of plant winter sleep period. During October to March, wheat enter winter sleep period and by finishing cold season and increasing of temperature during spring awakening, buds grow. Gradually by increasing temperature and day length, corymbs will be created and developed. Blossoms will emerge in May and June and fruit will grow immediately after creation. At the end of July and early August, during hardening of core , another stage of coarsening of fruit begins in terms of type and up to September and November it will achieve its maximum size. The end of plant vegetative season is concurrent with beginning of winter season. After finishing sleep period, annual growth circle will repeat again. Wheat plant is sensitive to temperature and can bear maximum temperature of -3°C (of course when the coldness because of temperature drop was not continues and sudden). If we refer table (1), we can observe that minimum average of monthly temperature at the coldest month of year, was not lower than 5°C .in order to have precise study, the average of min and max temperature had been considered.

Table(1): the average of monthly temperature changes in terms of ($^{\circ}\text{C}$) , Baghmalek township station (2002-2011)

The name of months												
	jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min average	4/7	5	7/3	11/6	16/4	21	24/7	24	19	15	9/5	6/6
Max average	14	16	19	25/4	33	39	41	41/7	37	31	22	17
Temperature average	9/4	10/5	13	18/5	24/6	30	33	33	28	23	16	11/7

Reference: Climatology office Khouzestan State, 2015

4-1-2- Rainfall:

Rain considers as a factor which has close relationship with the amount of product. In order to achieve good products, water requirements of plant should be provided. Wheat plant like other plants needs certain amount of water to grow optimally. If annual rainfall of region will be about 200mm, Wheat plant will grow, but in order to have optimum growth, some special care such as complementary irrigation is necessary. In regions where annual rainfall is between 300-500 mm, Wheat plant produce well and when annual rainfall is between 375-875 mm the product can be cultivated in form of dry farming (Sadeghi, 2003:50).

In table (2), the average of annual rainfall in Baghmalek township during 10 years period (2002-2011) was shown. According to this table, it is clear that minimum water requirement of Wheat plant is provided and therefore there is no problem in cultivating this plant.

Table(2):the average of annual rainfall in (mm) in Baghmalek township station (2002-2011)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
63/3	136/8	59	97/6	53/1	20/3	12/1	11/2	14/1	35/2	80/5	117/1

Reference: Climatology office Khouzestan State, 2015

4-1-3-Relative humidity:

High humidity of atmosphere affects significantly in terms of two point of views: first, can absorb humidity from around saturated air largely. Second, humidity is effective on plant photosynthesis. Most plants grow well in high humidity condition of atmosphere (Jasbersing, 2000:117-118). The threshold of optimum humidity for wheat growth and annually efficacy is between 55-65%. Relative humidity higher than 70% leads to disruption in wheat plant growth (Sheykh Ahmadi,2005:81).

In table(3), the average of annual relative humidity of Baghmalek township during 10 years period(2002-2011) was shown. We can observe that the most amount of relative humidity is in 2006 with the average of 45/1 and the lowest is in 2011 with the average of 37/3. Generally, relative humidity condition of area is suitable to cultivate wheat and relative humidity is not considered as limiting factor for cultivation.

Table(3):the average of annual relative humidity in Baghmalek township(2002-2011)

year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
The average of relative humidity	44/5	40/7	43/8	40/6	45/1	40	40/5	42/4	38/4	37/3

Reference: Climatology office Khouzestan State, 2015

4-1-4-Evaporation

Evaporation from plant to plant wheat in a region should be as described in Table(4). Thus, according to information obtained from the mean annual evapotranspiration Baghmalek township in a 10-year period (2002-2011) were identified Maximum evaporation in August with 443/3mm evaporation in January, with minimum 43/3mmHg is that in summer conditions is somewhat limited, but this can be compensated by increasing irrigation.

Table(4):Evaporation rate favorable and unfavorable for planting wheat

Desired evaporation rate	Evaporation rate of undesirable
-200	+400

Reference: Jasbrsyng, 1999

4-1-5-Chilling requirements and sunny hours:

In each plant , after vegetation and procreation activity , when the temperature goes lower than biologic zero, life activity decreases and lead to winter sleep or rest, and in fact in this stage of life activity, plant needs some coldness to rest and it is considered as a ground to start vegetation and procreation activity and specially stimulates flowering. Plants chilling requirements measure by sum of hours in terms of period in which temperature achieve to plant minimum threshold until achieve temperature to biologic zero (Mohammadi Danesh Vakilli,2006).According to minimum critical temperature for wheat plant which is -3°C , chilling requirement is related station was estimated on this basis(table5).

The results of present study show that the chilling requirement for wheat plant id different between 200-1200 hours and in studied regions this chilling requirement is provided.

Wheat plant is one of plants which needs a lot of sun shine and necessary light for Wheat is more than 1500 hours sun light in year. The light between 1000-1500 hours is considered as low light condition. The light lower than 1000 hours in year is not enough for growing wheat plant. Wheat plant needs 1500-3500 hours sun light in year (Darvishian, 1997:125).

According to 10 years statistics (2002-2011), the number of sunny hours in year are 3029/4 hours and the average number of sunny hours in Baghmalek township are 252/4 hours sun light in one month. In table7 , the number of sunny hours of Ize city during 10 years period (2002-2011) was shown.

According to table(6), Baghmalek township has suitable sunny hours to cultivate wheat and so in this field it is not considered as limiting factor.

Table(5): estimated chilling requirement in studied station

The name of station	Chilling requirement
Baghmalek township	511/8

Reference: Climatology office Khouzestan State, 2015

Table(6): the number of annual sunny hours in Baghmalek township (2002-2011)

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
The number of sunny Hours	3129/7	3021/3	3252/8	3095/6	3029/4	3100/1	3083/9	2861/4	3110/6	3041/7

Reference: Climatology office Khouzestan State, 2015

4-1-6-Agrology:

Although wheat plant is compatible with wide range of soils, it shows most performance in soils which can spread its roots without any physical and chemical limitation. Even very special poor soils can be used by wheat, too. Until the amount of salinity in soils is lower than 2.7 ds/m ($2.7 \text{ ds/m} > \text{EC}$), there is no decrease in performance (Sadeghi ,2003:220).

When there is enough water for irrigation, wheat produces sufficiently in various soils, but, suitable soils for wheat plant are light gravel and clay soils with alkaline reaction($\text{PH}=7/1-8$)and enough drainage (Mir Mansoori, 1999:23). In this regard, agrology features of Ize city were shown in table 8, after studying. Generally, considering

performed studies, it can be resulted that the soil of Baghmalek townships suitable to cultivate wheat plant, in terms of pH.

Table(7): PH condition of soil in Baghmalek township

Soil depth(cm)	pH
0-30	8
31-70	8
71-125	8/2

Reference: JIHAD agriculture office, Ize city,2013

5- Conclusion and recommendations:

Regarding the issues mentioned about the conditions and features of wheat and its adjustment with natural features of villages in Baghmalek township, it is revealed that conditions of region is suitable to cultivate this product in terms of climate condition.

existence of appropriate climatic conditions for planting, existence of appropriate rainfall at winter season and beginning of spring time that the rate of fruit is high, having sufficient humidity and water ,appropriate earth that is permeable for roots and existence of cultivable land in plains, slop with low descent, canyons, even hills.

Justification to cultivate and develop this product, was confirmed. So according to achieved results, following recommendations were presented:

1-In order to make active and dynamic urban and rural economy of every country, the most important factor is the attention of country government and governors to economy because any work cannot be done without pay attention to economy.

2-The marketing farmers to sell the wheat production with competitive price to neighboring countries (such as Iraq and other countries in the Persian Gulf)

3-Marketing and public relation: the most important issue in marketing and public relations in the field of global economy is the issue of mutual relationship with other countries. There is a theory in economy which says: advertising is half of business and merchandize. So, our country should have representative in all fields of agriculture, internationally and our agriculture products will advertise all over the world and motivation to buy should be created in buyers and their orders will be received and collected. Even, when we cannot produce one product, we should promise for purchase order with producer countries and perform as dealer, like the job was done by UEA, china, turkey,...

4-Also, management of irrigation can solve most problems of possible lack of water and drought in region, although only using of one method for irrigation is not correct and choosing most suitable method for irrigation is relied on environment geographical conditions

5- Preparing experimental and exhibitivie farms to complement performed studies and encouraging farmers to cultivate wheat under the supervision of investigative centers.

6- Sustainable management of soil and water. The importance of soil pH. Example, less use of chemical fertilizers. With the return of crop residue to the soil produced.

7- Developing security for agricultural products and facilitating insurance for farms were damaged by climate changes (chaturredi, 1988:88)

8- Agricultural mechanization (in 3 stages: planting - Found- recovery).

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