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## Survey the Role of Climatic Hazards in Soybean Forage in Golestan Province

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**ABSTRACT:** It is clear that determination of crop kind of every area and agriculture programming of areas depend on climate. One of the climate indicator characterizations is temperature change. Direct effect of temperature factor over distribution and dispersion of plants at earth is a certain matter. Susceptibility of plants as compared with low and high and optimum temperature and its effect on increasing and decreasing of growth and production speed of plants are scientific facts that has attracted most of scientists of herbaceous sciences. Soya crop is replaced as second prevailing cultivation after harvest of wheat and barley, and other spring harvests in Golestan plain. In this project, the researcher has tried that studying by using scientists views, work analysis, determination of occurring probability high temperatures of plant endurance, field operations and offering proposals of absolute role of temperature degree at stages of Soya growth and production. Also quality of temperature effect on Soya crop cultivation and its role at performance increasing and decreasing and correct management acts has been from view point good date choice during agricultural operations.

**Keywords:** Growing growth, Production al growth, Optimum temperature, Absolute minimum and maximum, Synoptic, Sunny hours, Length of day.

### INTRODUCTION

Since one of the targets of Islamic republic of Iran is attaining to independence and self – contained in agriculture products affair at first until forth development program and 20 years view.

Gorgan plain was considered as agricultural pole of the country by administrators because of having suitable weather, certain water source, desirable soil, available mechanization for cultivation, active economical force both men and women show own special and strategic position in all of self – contained and independence fields. These matters are accounted for the necessity of attention to Soya cultivation development.

Soya cultivation proportion with area climate, ever – increasing growth of population and its need to food, protein and suitable energy, harvesting of two crops at an agricultural year, using active rural group, establishing and development of secondary industries related to Soya, providing edible oil and dealing and other several derivatives, rising purchase power, preventing of villagers emigration and other profits. Meanwhile Golestan plain is suffering from heavy damages resulting regional phenomenon.

In this case that Soya became forage and have used for feeding and grazing of sheep in stead of discovering and seeding it have irreparable damages for farmers and have wasted country capitals.

In this project, we prove that factors of absolute maximum and minimum of temperature accompanied by other elements and unseen variables are obstacles for growth complement, in agricultural calendar of spring and summer cultivation of Soya that are caused discovering and seeding. Optimum for every plant is a temperature in which the most speed growth exists. If temperature is decreased the growth is slower (Claudine Rasolohery et al 2007). Also if temperature is increased, growth speed decreased more. Optimum temperature for Soya growth is 30-33 °C on the basis of all resources that writer have studied. On the basis of this view, flower and sheath fall is increased because of > 35 °C temperature or more. Also Brown finds that Soya growth has stopped at about 10 °C and have maximized at 30 °C (Ishizu, M. et al 2008) Less than 15 °C or more than 37 °C have reverse

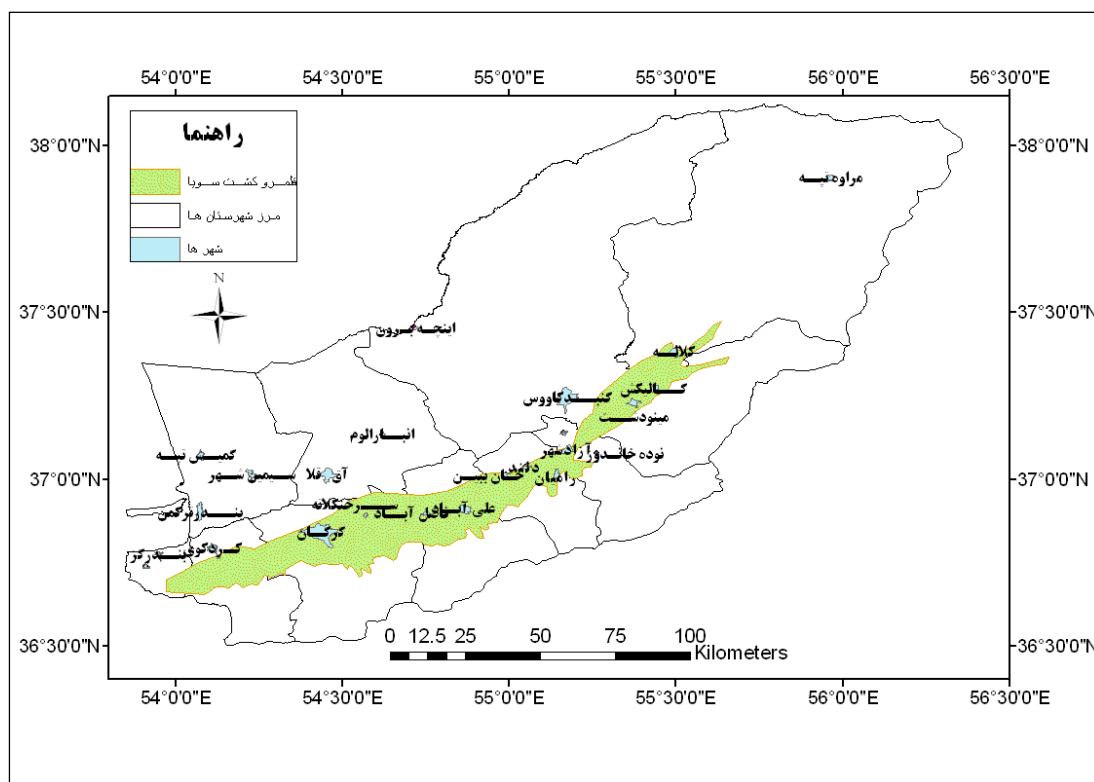
effect in growth. Susana P. Armada (2003) found that sheath formation decreased 57-71 % at more than 40 °C. Iranian oily seeds development company have considered minimum and maximum of temperature between 10-38 °C for Soya growth. Other case is the study of high absolute minimum of plant endurance. In this case we will average among minimum temperatures that researchers know growth stop cause and flowering stop and we will account percent of minimums occurrence cases at 6 month of growth period.

Now we are studying some of researchers' views in this background. Li, Dexiao et al(2009) show that Temperature less than 15 °C has reverse effect in Soya and 25 °C or less than 25 °C will retard flowering. Also Luz Maria Paucar-Menacho et al (2009) show that Soya growth is stopped about 10 °C, he added that flowering is happened very weak less than 20 °C and if temperature increases, until 32 °C flowering will increase. Carlos Bengoechea et al (2007) show that Experiences proved that zero of plant is 10 for some varieties and for most of them is 13 °C. So on the basis of researchers view, average of minimum temperature 10,13,15,20 is 14.5 °C. Dexiao Li et al (2009) show that occurrence percent of 14.5 degree and less than it that caused growth and flowering stop of Soya. With respect to this point, Soya flowering time means Jul, Aug month minimums role for making damage and operation decrease is more clear because of high sensitiveness of Soya .because Soya is short day plant, and it's flowering begins with shortening of day. Seth L. Naeve et al(2007) determine that whether analyses of farmer-grown soybean seed samples could detect significant regional differences in soybean quality traits. SEAN F.O'KEEFE. (2006) study on the effects of temperature on naturally occurring disease resistance and deal of product.

**Materials and Methods**

For this study, first it has been tried these matters should be analyzed with using scientist's views from various sources. Optimum temperature, useful maximum and minimum for Soya growth, high maximums and minimums of plant endurance. At next stage, the aim is to estimate incidence probability of absolute maximum and minimum events of plant high endurance in area with using 48 years statistics of Gorgan synoptic aero logy station(table 1). At the end of any stage, with respect to absolutes incidence percent at spring and summer cultivation , it have tried that the best position of cultivation because of prevention from common problems of foraging meantime proclaim of unsuitable cultivation time danger.

Although the above view have contradiction with some of world researcher's views. We set calculations base of maximums the same 38 °C. On this basis , we will show occurrence percent of temperature over Soya endurance with studying absolutes maximum and minimum of Gorgan synoptic aero logy station 48 years studied months are the same growth period month's means , May , June , July , August , September and October. Temperature indicator of our studding base is 38 °C and more than this. Table 1 shows – Maximum Absolutes of temperature , the Station of Gorgan

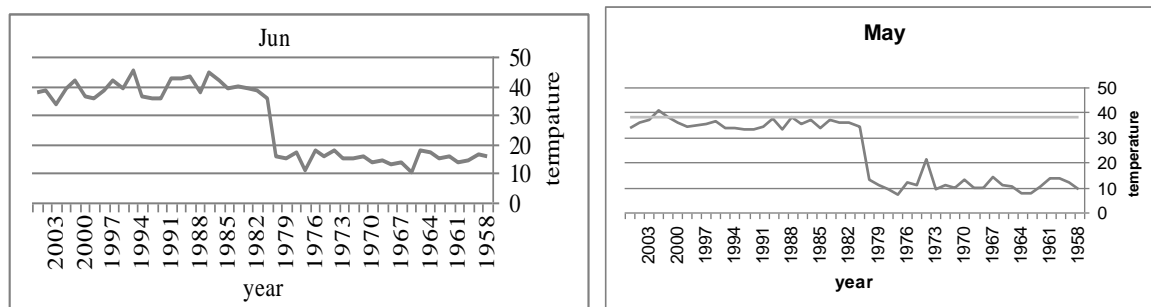


Map of soybean cultivation in Golestan province

Table 1. Maximum Absolutes of temperature, the Station of Gorgan. 48 years

Oct	Sep	Aug	Jul	Jon	May	years
38.7	36.4	37.4	38.2	40	34.4	1958
37.6	35.7	37	39.6	40	37.8	1959
34.4	35	39.8	37.4	42.6	41.8	1960
32	38	38.4	43	39.6	38	1961
31.2	36	38.2	40.8	39.6	35.4	1962
29.6	32.2	37.4	37.6	38.2	38	1963
34.4	36.4	38.2	38.8	42	39.6	1964
28	34	38.4	40.4	39	37	1965
32	31.6	35	34.2	38.6	36.8	1966
33.8	39.6	37	41.2	34.2	38.2	1967
28.8	36	36.6	43.6	43	38.6	1968
30	38	36	38	33	43	1969
36	35	37	38	38	35	1970
36	37	40	37	38	39	1971
30	31	37	39	37	41	1972
35	31	37	40	37	37	1973
33	37	37	39	38	38	1974
32	35	38	38	40	35	1975
29	35	39	38	43	36	1976
34	39	35	38	36	30	1977
37	41	39	38	42	32	1978
31	33	37	39	43	39	1979
32	38	37	40	37	35	1980
35	35	34.6	39	35.6	34	1981
29.6	32	38	40.2	38.2	36	1982
32	34.8	34	38	38.8	35.6	1983
39	36.6	36.8	35.6	39.8	37	1984
35.6	35.8	37.6	40.2	39	33.8	1985
32	33.4	37.2	36.6	41.8	37.2	1986
29.8	41.6	33.2	35.4	44.4	35.4	1987
38.2	37	36	40	37.4	38	1988
32.4	36.4	34/2	37.4	43	33	1989
34.2	34	32	40	42.2	37.4	1990
34	32	34.5	35.8	42.8	34	1991
30.6	33.8	35.6	40.4	35.8	33	1992
30.6	33.8	35.6	40.4	35.8	33	1993
31.2	31.8	33.8	34.6	36.4	33.6	1994
35.4	36.6	35.8	35.2	45	33.8	1995
32	40	37	38	38.8	36.6	1996
35.8	36.8	36.6	35.6	41.8	35.2	1997
33	36.8	39	37.4	38.5	34.6	1998
30.2	36.8	41.6	36	35.8	34	1999
28.4	36.6	41.6	38	36.2	36	2000
38.4	35.6	39.2	38.6	41.8	38.2	2001
38.6	35.6	40.2	39.8	38.8	40.6	2002
35.5	36.8	41.5	36.2	33.4	37.2	2003
36.6	39.2	37.2	35	38.2	36	2004
36.6	35	38	37.2	37.8	33.8	2005

On the basis of 48 years statistics of Gorgan aero logy stations , temperature occurrence of 38 °c and more were 34.3, 74.3, 74.3, 31.4, 17, 3.4 percent respectively at , May , Jun , Jul , Aug , Sep , Oct (Figure 1).



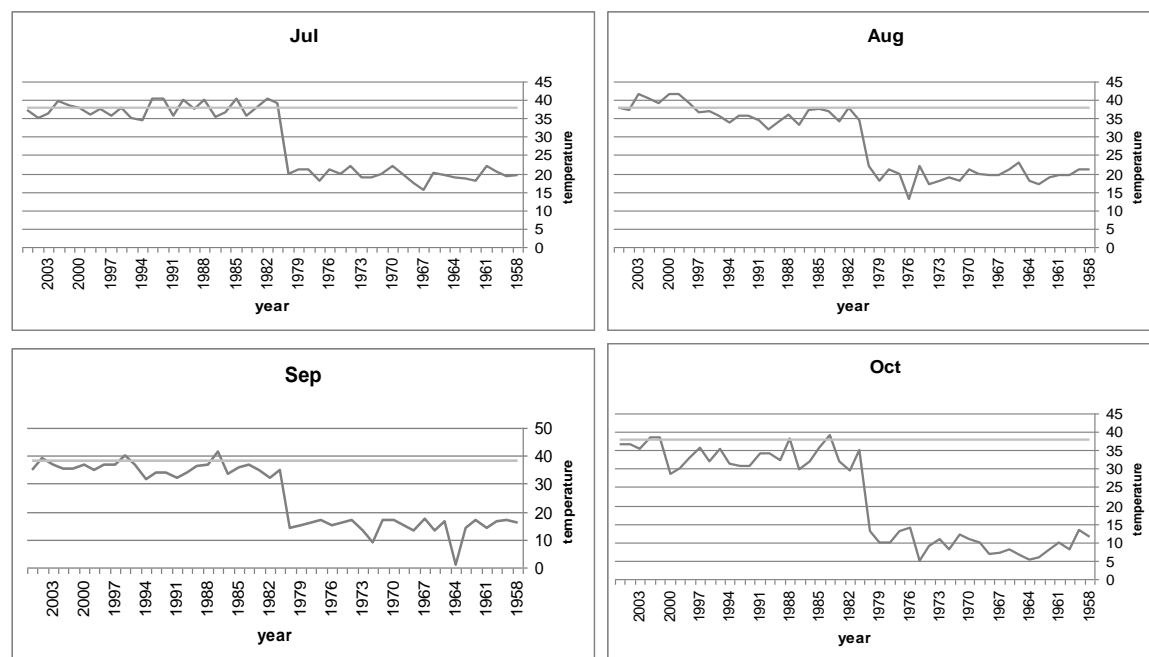


Figure 1. Temperature occurrence of 38 °C and more On the basis of 48 years statistics of Gorgan aero logy stations

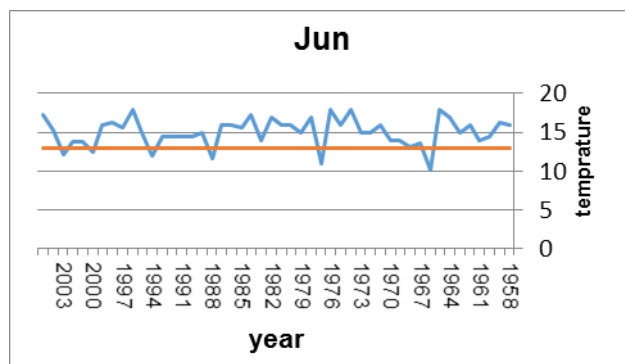
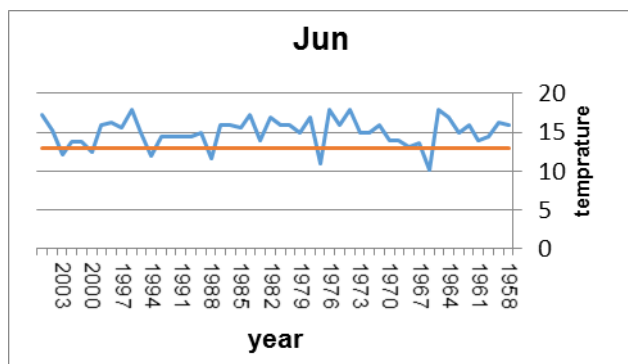
This estimates show that the best time of Soya cultivation is middle of May in spring. Although it may exist 34% occurrence probability of plant endurance with high degree , but soil have enough wet , because of spring rainfalls and soil have confront power against this temperature , because plant can be continue to its growth using soil wet. But in summer cultivation , we are concluding that the above degree about 74% of cases have contradiction with optimum temperature that means 30-33 °C .Although after irrigation and cultivation , Soya seed will bud after 3-5 days. But when growth period is expired and soil loses its wet and plant becomes without water and doesn't have high temperature endurance, Plant grow structure became confused, in Aug month is decreased day length and plant begins flowering and plant is using its energy for making chlorophyll. Sheath and flower fall is increased and Just as we said that is decreased formation percent of sheath about 57-71% .In this time summer cultivations and late cultivation of Gorgan 3, specially become foraging (grassing) so in good time cultivation is necessary (means when weather and soil wet is sufficient for suitable cultivation).Bad effect of high temperature was abundant during growth season and depends on plant kind and members. Plants of temperate areas don't bear fruit in high temperature. If temperature in Creases, burning of branches end and decay is seen. Also slow growth of plant is happened. Its other events are fruit falling, bad color and flavor and low durability after harvest. Table 2 shows Minimum Absolutes of temperature, the station of Gorgan

Table 2. Minimum Absolutes of temperature, the station of Gorgan. 48 years

Oct	Sep	Aug	Jul	Jon	May	years
11.4	16	21	19.5	16	9.4	1958
13.4	17	21	19.2	16.2	12	1959
8.2	16.4	19.4	20.4	14.4	13.4	1960
10	14.2	19.6	22	14	13.6	1961
8.2	16.8	19	18	16	10.2	1962
6	14	17.2	18.6	15	7.4	1963
5.2	13	18	19	17	7.6	1964
6.4	16.4	23	19.4	18	10.4	1965
8	13	21.2	20.2	10.2	11	1966
7	17.4	19.4	15.4	13.6	14	1967
6.8	13	19.6	17.4	13.1	10	1968
10	15	20	20	14	10	1969
11	17	21	22	14	13	1970
12	17	18	20	16	10	1971
8	9	19	19	15	11	1972
11	13	18	19	15	9	1973
9	17	17	22	18	21	1974
5	16	22	20	16	11	1975
14	15	13	21	18	12	1976

13	17	20	18	11	7	1977
10	16	21	21	17	9	1978
10	15	18	21	15	11	1979
13	14	22	20	16	13	1980
6.6	16	20.5	20	16	13	1981
11	14.4	18.6	20	17	16	1982
6.4	14	18.4	19.2	14	6.2	1983
7	14	16	19	17.2	9.6	1984
8.6	11.6	16.6	17	15.6	9.4	1985
3	10.6	19	15.2	16	7	1986
7	12	18	19.2	16	8	1987
6.5	11.8	19.4	20.2	11.6	6.2	1988
5.2	16	20.6	20	15	11.2	1989
10.2	10.8	20.5	17.5	14.4	10	1990
6.5	13.4	16	17.8	14.5	3.8	1991
5.6	13.5	18.5	20.2	14.5	8.5	1992
5.6	13	18.5	20.2	14.5	8.5	1993
7.8	13.4	21	18	12	10.2	1994
3.4	11.8	20.5	19	15	11.5	1995
7.8	13.6	19.4	19.2	18	12.4	1996
10.4	14.6	21.6	21.4	15.6	10	1997
6.2	15	19	20	16.2	8.6	1998
8.4	12.2	22	18	16	8.2	1999
8.2	15.6	20.2	21.8	12.4	10	2000
5	14.8	17.6	18.8	13.8	12	2001
10.2	15	18.8	18.4	13.8	8.2	2002
12	15	20.4	19.8	12.2	2.8	2003
7.2	14.8	19	18	15.2	9.4	2004
6	18	19.6	22	17.2	10.6	2005

So results of 48 years statistical calculations shows that occurrence probability of minimum 14.5 degree and lower was happened at "May , Jon , Jul , Aug , Sep and Oct month" , respectively 97,34.3,2.9,51.4,100%( Figure 2).



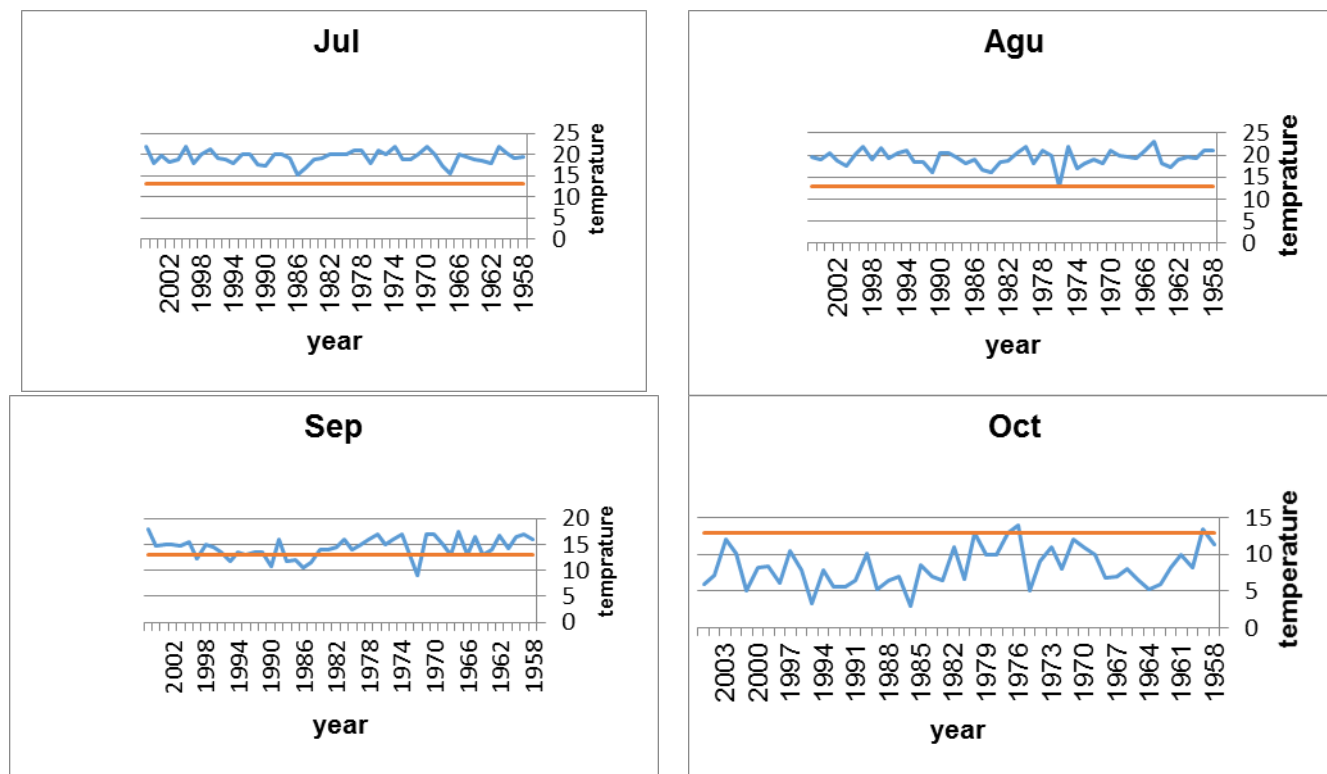


Figure 2. Temperature occurrence probability of minimum 14.5 degree and lower On the basis of 48 years statistics of Gorgan aero logy stations

In this time, spring cultivation has succeeded in 100% of cases because plant have completed developmental growth period. In Aug month production growth is 2.9% of cases and has no danger. In summer cultivations and mostly late cultivation, delayed plant maturity because of not enough chance for making branch and leaf and linear growth. In this time new plant has more sensitiveness of spring cultivation minimum high temperature of plant endurance is 51.4% in September and 100% in October months. Danger of low temperatures has mentioned and now we say other harms of minimums. Very low temperature has caused loss of texture, cells and plant organs. This case happened to temperature of 10 °C for some sensitiveness plants, Damage will appear as necroses, textural analyses, browsing, low growth and inability to seed sprouting. Indirect damage may happen like seeding decrease, delayed harvest season, uptake and photosynthesis decrease (Villarino, A 2000). In any case, late cultivation and Gorgan 3 variety "after Jul" also had this problems and this cultivation become grass or forage that is used for sheep feed. The results of 48 years statistical calculation , shows that most of years , temperature is less than 10 °C and this temperature is very dangerous for green Soya ."Figure 4" shows a comparison between Williams kind (premature) and Gorgan 3 (late mature).It is clear that Soya is green in this date (equivalent, 17 Sep), and above problems is foreseeable with low vacillation of temperature. So for preventing from foraging phenomenon with respect to statistics, it is recommended: changing of growth period of variety, from summer to spring. In some cases it is no problem because of rainfall and suitable temperature. In compulsion case for late cultivation, it is recommended that Soya should be cultivated and high accumulation is censed increasing growth. In any case researches are continued to variety resistance cultivation against minimum and maximum temperature and short growth per

**Discussion and conclusion**

- 1) Spring Soya cultivation mostly is succeeded with respect to evidence and documents. Of course 34% probability. Existed for maximum temperature of plant endurance, but soil wet is confronted against temperature because of spring rainfalls. And plant is continued to its growth. On the other hand, production growth begins because of short day Soya that is faced with minimum temperature over plant endurance with 2.9% of cases. This condition doesn't make problem in seeding of plant with respect to enough chance of plant for branch and leaf production and enough linear growth.
- 2) summer cultivation of Soya is different from optimum temperature 74.3% and Jul cases because of occurrence probability of maximum degrees over plant endurance that grow structure of plant is confused with finishing growth period and high temperature and losing of soil wet Aug month flowering begins and plant uses it's energy for making chlorophyll in stead of making sheath and seeding. On the other hand, maturation is delayed because of loss of enough chance for growth

completion. 51.4% of Sep month 100% of Oct cases is faced with minimum temperature over plant endurance that we said danger of high and low temperature late cultivation and water shortage are important. Damage a rising low temperature is Necroses, textural analysis, browsing, decrease of seed delayed harvest season, decrease of photosynthesis and uptake. Damage a rising high temperature is burning of branches and yellow leaves and at the end all of them caused death.



Figure 3. Damage of low or high temperature and cultivation



Figure 4. Comparison between Williams Kinds (premature) at the top in a picture and Gorgan 3 (Late mature) at the bottom in a picture

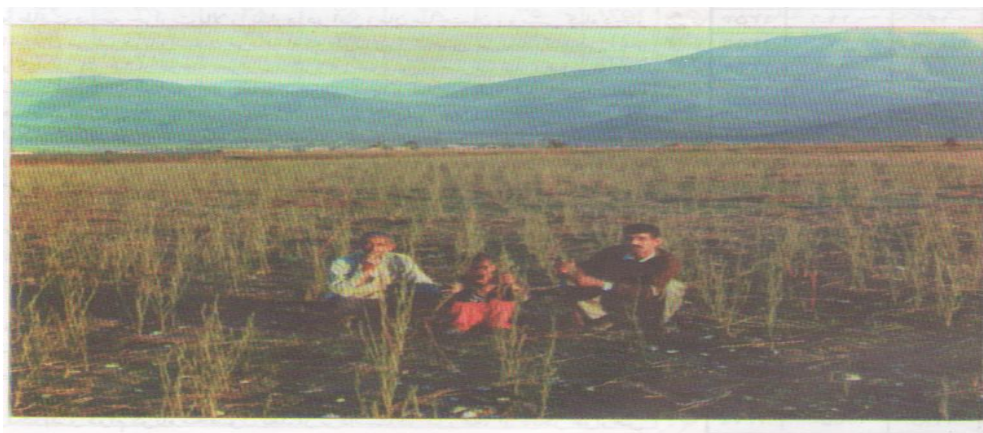


Figure 5. Soya of forage for feeding of sheep

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