

Application of technologies GIS for forecasting of climatic changes and an area of cultivation of a pistachio (*Pistacia vera* L.)

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Introduction



Natural plantings of a pistachio (*Pistacia vera* L.) grow in arid foothill areas of Uzbekistan: Babatag, Nurata, Western Tien Shan, Gissar, Chatkal.

The given regions are considered as the native land of a pistachio.

Now, the areas of natural plantings of a pistachio are reduced under the influence of a number anthropogenous and abiotic (increase temperature of air and reduction of deposits) factors (Ablayev, 1992; Chernova, 2004; Griza, 2008).

Research objective

- To define regions with favorable climatic conditions for cultivation of a pistachio with a view of preservation and an effective utilisation of its biodiversity for well-being of local population in the light of predicted change of a climate in Uzbekistan.

Research problems

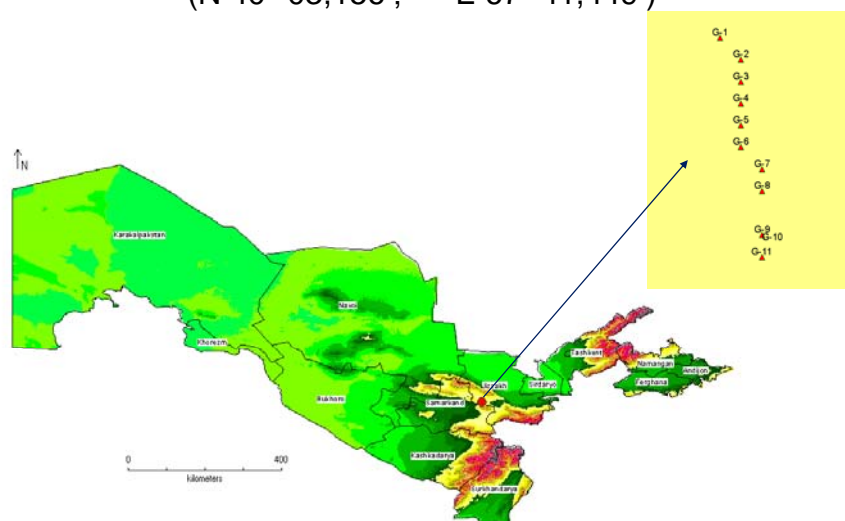
- To define possible changes of a climate on prospect (2050 y.)
- To define favorable regions for cultivation of a pistachio on the basis of data the wood experimental station of Gallaaral (WESG)
- To develop the recommendations directed on adaptation of manufacture to changing conditions of environment

Methodology

- To define possible changes of a climate (temperature and deposits) in Uzbekistan (2050) by means of modern DIVA-GIS technologies on the basis of long-term given (1950-2000)
- To define regions with the conditions favorable for cultivation of a pistachio (the preliminary long-term forecast).

Regions where there are skilled sites

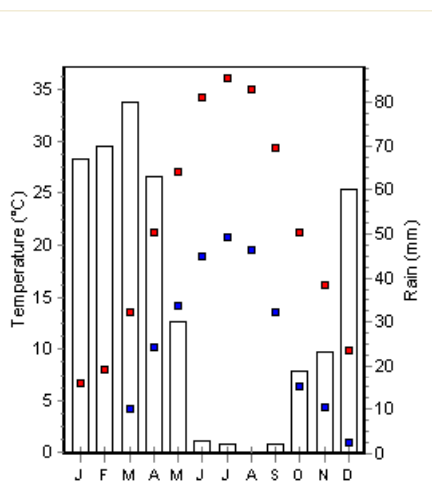
(N 40° 03,156'; E 67° 11,449')



Pistachio plantations of wood experimental station of Gallaaral



Climatic data of WESG on DIVA-GIS



Bioclimatic Variable

Annual Mean Temperature	15.3
Mean Monthly Temperature Range	12.4
Max Temperature of Warmest Month	36.2
Min Temperature of Coldest Month	-2.3
Temperature Annual Range	38.5
Mean Temperature of Wettest Quarter	4.9
Mean Temperature of Driest Quarter	25.7
Mean Temperature of Warmest Quarter	27.5
Mean Temperature of Coldest Quarter	3.7
Annual Precipitation	419
Precipitation of Wettest Month	80
Precipitation of Driest Month	0
Precipitation of Wettest Quarter	217
Precipitation of Driest Quarter	4
Precipitation of Warmest Quarter	5
Precipitation of Coldest Quarter	197

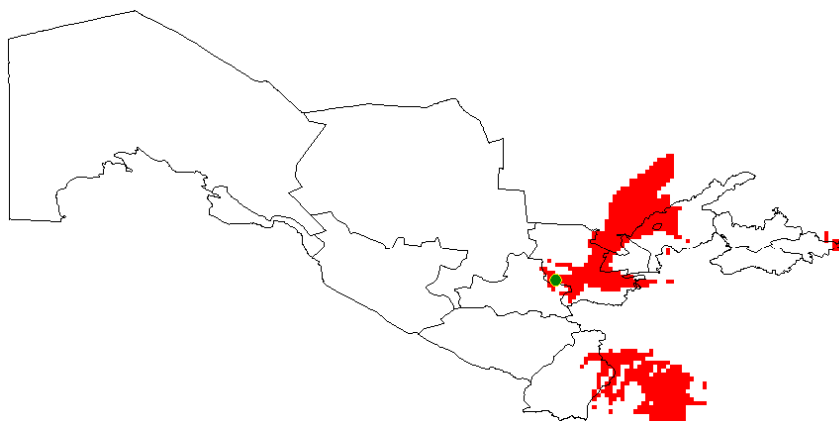
Table 1.

Favorable ecological conditions for growth of a pistachio

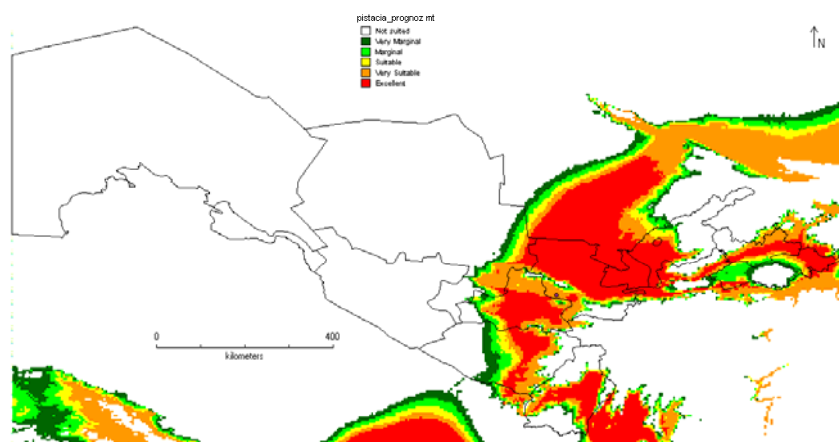
Duration of the vegetative period, days	Temperature, °C	Quantity of deposits, mm
Gmin=150	Tmin=-20	Rmin=250
Gmax=180	Tmax=50	Rmax=500
Gused=165		

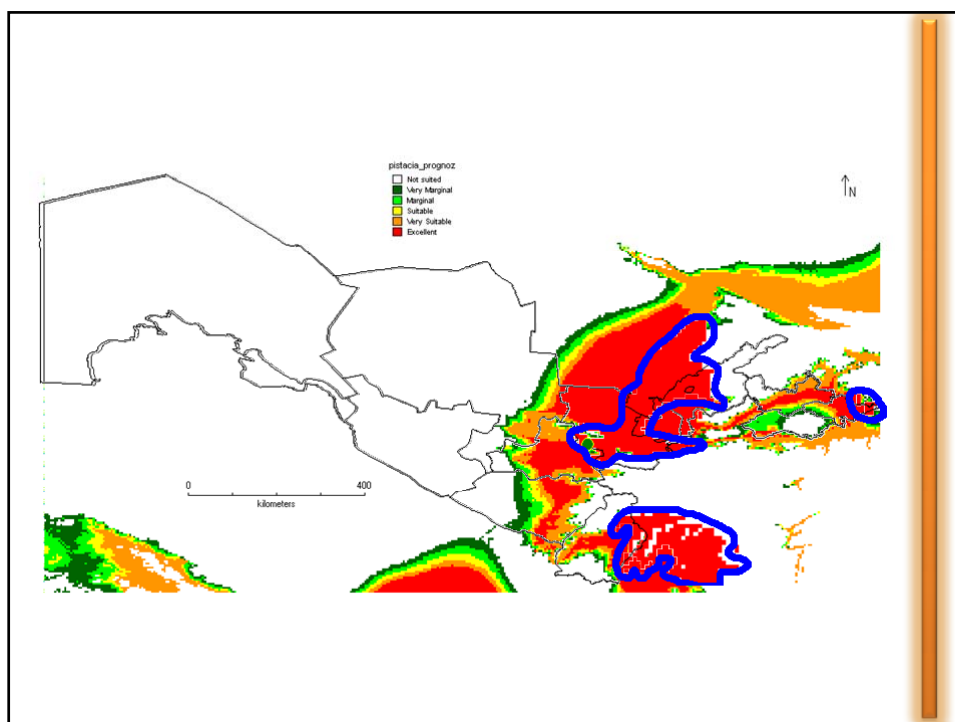
The temperature of air and quantity of annual deposits are the basic climatic factors defining conditions for growth and development of a pistachio present. For this reason, for the analysis of changes of climatic conditions we have chosen only such parameters as, temperature of air and annual quantity of deposits from a database. Microclimatic indicators of co-ordinates (width and a longitude) where there are skilled sites, have been defined by means of a database of programs. Further other regions with similar indicators have been noted on a card.

Regions with climatic conditions (temperature, annual norm of deposits) are favorable for creation of pistachio plantations now



Regions which will be favorable for creation of plantations of a pistachio present as a result of change of a climate of conditions by 2050





THE CONCLUSION

- ✓ In the regions specified in presented drawing, in the conditions of not so strong saline lands and low subsoil waters the pistachio well grows;
- ✓ It is recommended to consider climatic changes in the future before creation of pistachio plantations to keep productivity long years;
- ✓ For reception of a stable crop planting of drought-resistant and annually fructifying grades and forms is recommended (518-G, 521-P).

