SJIF Impact Factor: 7.001| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 5 | May 2020 - Peer Reviewed Journal

# IMPACT OF ARAL SEA DRYING ON COTTON PRODUCTIVITY

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**Article DOI:** https://doi.org/10.36713/epra3426

## ABSTRACT
*Incorrect use of water resources brought to the drying of Aral Sea. This brought to formation of salty dust deserts. Salty dust aerosols are delivered to adjoining irrigated territories by wind. Soil saltiness increases which negatively influences on the productivity of cotton. For softening negative influence it is recommended to use organic fertilizers in quality of mulch in account of 20-30 t/h.*

**KEYWORDS:** *drying, salinization, salty dust aerosols, cotton, yield, organic fertilizers, mulching.*

## INTRODUCTION

Situated in the middle of desert The Aral sea had a favorable impact on natural-climatic and environmental conditions of surrounding regions and was humidity regulator over a wide area of the Aral Sea region, protector of dry hot wind, coming from the Southern Desert.

In the result of extensive water use brought to a sharp reduction in river flows of Amudarya and Sirdarya into the Aral sea. The aridity of the climate increased, air humidity decreased by 10-18%, frost-free period reduced by 30-35 days.

At present 25000 km² of sea floor exposed and coastline has receded by 100-150 km. Subsequently, another powerful source of sand-salt aerosols has emerged in Central Asia, transported by air masses to adjacent territories. Dust hoisted by storms onto the soil surface reduces fertility and therefore adversely affects the productivity of cultivated crops. The main environmental problems of Karakalpakstan under the conditions of extensive economic activity were cotton monoculture. Cotton production in the country as a whole reached 80 percent in the eighties and nineties. It is an unprecedented indicator in the world, although science has shown that cotton above 50-60% causes humus loss, soil depletion, infertility and eventual land degradation.

## METHODS OF CONDUCTING THE EXPERIMENT

To study the impact of the drying of the Aral Sea on the productivity of cotton and soil fertility, field studies have been carried out on the remoteness (150-250 km) from the dry seabed of the Aral Sea. Cotton, cultivated in the Central (Khodjeli region) and northern (Kanlikul region) climatic soils of the Republic of Karakalpakstan was selected as the object of study.

The test sites are located in Khodjeli and Kanlikul regions accordingly 250 and 150 kilometers far from the dry seabed of the Aral Sea. The soil of the test plots is more typical for the conditions of the specified zones of the Republic.

C – 4727 cotton varieties were sampled, in row-spacing 60 cm, area of each plot 240 m² of which 120 m² (2.4-50 m) repeated three times, located in one tier.

The test options are as follows:

1. Cotton, normal cultivated conditions.
2. Cotton, closed field (10.2 m²).
3. Cotton, mulching with manure for 10 t/ha before the first cultivation.
4. Cotton, mulching with manure for 20 t/ha before the first cultivation.
5. Cotton, mulching with manure for 30 t/ha before the first cultivation.

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## RESEARCH RESULTS AND THEIR DISCUSSION

The data obtained indicates that salty dust aerosols falling on the cotton fields, adversely affect the growth and development of cotton. Cotton cultivated under normal conditions significantly lags in growth and development from other options, where the additional measures are applied to mitigate the adverse effects of salty dust aerosols.

Effectiveness or influence of those factors during the growing season of cotton is estimated to have an impact on the yield of raw cotton. Differences between options according to cultivation condition was 2.1 – 0.9 c/ha. In option 1, where the cotton was cultivated in the usual manner, the raw cotton harvest was 24.1 c/ha. In option 2, where the cotton was cultivated in a salty dust aerosol protected area was 26.2 c/ha, there was an increase of 2.1 c/ha over option 1.

The use of organic fertilizers as mulch (options 3, 4 and 5) at 10, 20 and 30 t/ha contributed to an additional 4.2 to 9.0 c/ha compared to option 1, that is organic fertilizer largely mitigates the negative effects of salty dust aerosols and improves soil nutrition.

## CONCLUSIONS

Thus, to mitigate the adverse effect of salty dust aerosols on cotton yields and soil fertility options 4 and 5 are economically more effective, where 20 and 30 t/ha of organic fertilizer were used before the first cultivation of both the Central and Northern areas of the Republic.

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