

The Nature Of Dust Storms In Tikrit And Their Effect On Plants

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ABSTRACT

This study provides a summary of different impacts of sand and dust storms on the agricultural plant, as sand and dust storms have reduced crop yields by burying seedlings under sandy sediments, poor tissue for plant luck, diminished photosynthesis process as a result of sand blasting and delaying plant improvement, and expansion. In ending the dangers of the dry season, causing harm and reducing the efficiency of animals, expanding soil disintegration and accelerating the way corruption and desertification arrive, filling water system channels with silt, covering transport cycles, affecting water quality in waterways and currents, and influencing quality discussion.

Tikrit range is extensively under effect by desertification and dust storms coming as a result of site of Iraq-Syria border. It also appeared that normal harshness of accelerating dust in percentage of five times the standard limits of the Iraqi trend (10 g / m²), which cause severe harm for human health as the dust particles contain many toxins in circulation and crushing minerals associated with this particle size. This study achieved to conclude a comprehensive review of the writing on the impacts of hygiene on plants and communities. Initially, characteristics of the different ordered species are described, with those essential components highlighted in deciding the potential impact their demonstration might have. Arrangement effects are compatible with vegetation type. Then an analysis of the effects of dust on crop species and a number of plant species conducted.

Keywords: SDS, Particle size, agriculture.

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INTRODUCTION

The global aerosol system[1] is dominated by dust. Air quality, atmosphere, biosphere and chemistry can be influenced by dust[2]. Two major sources of dust exist: natural and human sources[3,4,5] while human-activities-induces the dust of construction[6], transport [7], combustion of fuel [8], mining at open pits, etc. are primarily induced by wind erosion, rock weathering, dust storms, etc. Sand and dust storms cause a natural danger that also impact large parts of the continents. Produce continent-wide impacts. Effect on individual and national health and economies. This paper provides a description of different effects of sand and Agricultural dust and future use of a SDSWS for agriculture consumers. Sand and dust storms are connected to soil in agriculture land and degradation[9].

Dust storms are remarkable wonders in Iraq that speak to the real popular danger of a significant day of storms. Such wondrous conditions have a wind speed of just 25 miles/hour, playing a dynamic part in the transportation and testimonial of materials of different sizes that shift the surface of the soil. The most prevalent of these storms in Summer and Spring is the "Shamal," when a gushing northwest wind blows through Tigris and Euphrates , which streams towards cities of south of Iraq [10]. In addition, Al-Dabbas et al, evaluated that surface of clean drop out extended from sandy clay sediment and clayey sandy sediment , though the quartz, feldspar, and calcite were most of light minerals, and chlorite, illite, montmorillonite, palygorskite and kaolinite were most of clay minerals within dust aftermath [10].

Soil gets poisons as a result of many causes as identifying sources, counting car gasses, chimney plants, dust storms, etc. Banerjee, concluded that environmental emissions are measures of the composition and volume of chemical matrix of road pollution [11].

Dust has a distinctive influence on crops, meadows, heathlands, trees and woods, cold bryophyte and lichen

populations. Dust can affect photosynthetic process, breath, sweat and make phytotoxic vapor poisoning to infiltrate. Indications of unmistakable damage can occur and efficiency is largely reduced [12].

Storms of dust are a big environmental concern. The current research, in which precipitated dust was measured for 2011 and 2012, includes locations in Tikrit. The stations were in suburban, business and industrial areas. The findings reflect a difference within the same year in the mean of precipitated emissions (different results with months) and a rise in 2012 [13].

Characteristics of dusts

An arid and semi-arid meteorological phenomenon is a sand and/or dust storm. Storms of dust emerge when a blow or other solid front occurs from a dry surface, wind blows loose sand and gravel. Suspension and salting transport the particles, which carry soil from one position to another [14]. The word "sand storm" is most widely used in desert sandstorm background, particularly or areas in the deserts in which sand is higher than soil or rock a significant amount of bigger sand particles besides the fine particles obscuring the visibility the surface is blown closer. The expression "storm of dust" probably used when fine particles blown long distances, in particular urban area is affected by the storm[15]. Storms of sand and dust (SDS). This has a huge effect. Social and economical life and human growth in the Area. Region: South and South East Iraq is affected Iraq "Shargi" (means from the Arabic language) South), with an occasional dry wind of 80 gusts Km/h from April to the beginning of June. Between the end of September and November. The breeze takes along it can climb up to many heights of violent dust thousand meters. Between the middle of June and the middle of September, the From the north and northwest blows "Shimali" wind. Quite hot air allows for extreme heating which makes desertification worse. These two winds in particular are

the cause of intense SDSs in the area[16]. Dust is significant in its impacts with a number of features. Dust can have physical as well as chemical effects. The powder that falls on plants will make plants leaves more smooth physically. The deposition level is therefore significant. Percentages of dust emission, weather and conditions on the leaf surface are affected. Dust can also obstruct the stomata physically. The stomata's diameter was 8-12/ μm for a variety of plant varieties, according to [17]. Therefore, if dust works in stomata functions like this, particle size is significant. Dust of different roots is chemically very different. Perhaps more significant than physical effects, the chemical influence of dust, on the soil or directly on plant surfaces[18]. Iraq is one of the most endangered Iraq climate change countries in the region and faces a single one. Environmental deterioration and increased frequency of extreme weather events, in particular

Analysis impacts of dust pollution:

- **Impact to environment:**

Air quality impacts: quality of air get loss due to damage concentrate especially in increase in the concentrations of particulate matter[19], and the decreased visibility of the atmosphere in line with the diffusion rules and environmental building dust impact, damage to climate [20]. The building dust reflects the low thermal entry of the sunlight away from earth and results in the earth's surface cooling[21]. Ecological damage is primarily caused by vegetation damage, such as heating, and other side effects in epiphytes [22]. Damage to the architecture in the vicinity. Owing to the dust retention impacts, physical and chemical loss are separately part of the damage to the surrounding architecture. In particular, dust diffusion directly induces the former, whereas the latter is some form of architectural erosion with chemical reactions diverse particles. vehicles damaging when vehicles are in or out of building sites, they are typically exposed to building dust. Like damage to nearby architecture, The cost of cleaning vehicles is regarded as a loss because of the impact of dust storage[23].

- **Agriculture Impacts of Sand and Dust**

Due to storms various types of agrarian impacts[24]. The loss of crops and livestock is one of the most direct consequences. The sandblasting of sand and soil particles contributes to a direct loss of plant tissue. This loss of leaves of plants, photosynthetic activity is decreased and energy (sugars) are reduced to be used by the plant to increase, replicate and grow grain, fibers or fruit. The plant will re-grow the missing leaves, and loss at last crop yield will be relatively small if happened in same time of sand and dust storms is sufficient early in the green season. However, even here, any regeneration of the leaves is likely to result in loss of yield. Furthermore, Plant growth energy loss would also slow the production of plants, and this could increase season end droughts risk in regions with short growing times by shifting humidity-sensitive time (corn-filling reproductive) over the favorable plants and lead to reduced returns and output. If late in the season the sand and dust storms happen there would be direct harvest loss if the damage to the plants affects yield during grain growth[25]. The young plant will be buried and probably killed because the sun is not enough for photosynthesis in the early

season. Non-storm-protected animals may be directly affected, and any physical stress on livestock will reduce their productivity and growth. A further agricultural consequence should be take in consider is loss of soil fertility. Surface depletion make soil erosion more than normal, worsening process of soil degradation and desertification. Topsoil contains most percentage of fertile continents of the soil and contains many of the primary nutrients for plant growth such as potassium and phosphor and can be transmitted for a good time. The eliminating activity of a soil that is naturally rich in nutrients and organic matters is of particular concern as it potentially has an impact on the soil resources and thus the production of crops on a long time basis. Productivity costs are difficult to calculate but are possibly very large. [26].

Study Area and Methods

To calculate the precipitated dust for the years (2011-2012), 3 locations in Tikrit were selected. The collection sites were located in resident place, commercial and industrial areas. Samples were collected every month of study period for years from 2011 to 2012 . The measurement method was:

- Collect the dust in the container by cleaning it several times with distilled water.
- Collect the 500ml backer solution.
- Drying up solution to smallest size possible (up to 50ml).
- Move solution again in a fresh, safe, dry weight that is known (w_1).
- The glass continent was dried at 105 $^{\circ}\text{C}$ in the oven and left to be cold and then weighed again (w_2).

Equation used to measure precipitates number. Amount of precipitated dust in g/m^2 $w * 10000 \div 0.7855 * 225$ [27] Where $w=w_2-w_1$

Photographical work of selected crops was conducted for eight weeks. Firstly, selected study area was surveyed for effect of dust on plants and few plants were marked for further observations. Crushing units running at in Tikrit responsible for this dust pollution.

RESULTS AND DISCUSSION

Dust and sand storms are a chronic issue in Iraq and other places in the world, but they are most prevalent during the spring and summer months due to the strong winds that define the atmosphere during the winter-spring seasonal change. Particularly when heavy (most of them dry) storms excite certain particles, dust and sand storms occur.. These particles. sand raise forward and ahead Again (since the winds appear to be cold fronts. Behind the front better than in front of it). This time of year The easiest way to describe patterns is to combine two Separate meteorological systems: subtropical jet stream from the south and a polar one. The European continent's forward jet stream pushing down. If these two systems are nearby, they produce much more complex weather than they are. In this region usually found, in particular the strong "Shimali" winds to the northwest [28]. In Fig 1: the right figure indicates the atmospheric form of a dust storm. Notice that it started in the northwestern frontier of Iraq and the left figure indicates the storm of dust in the west of Iraq.

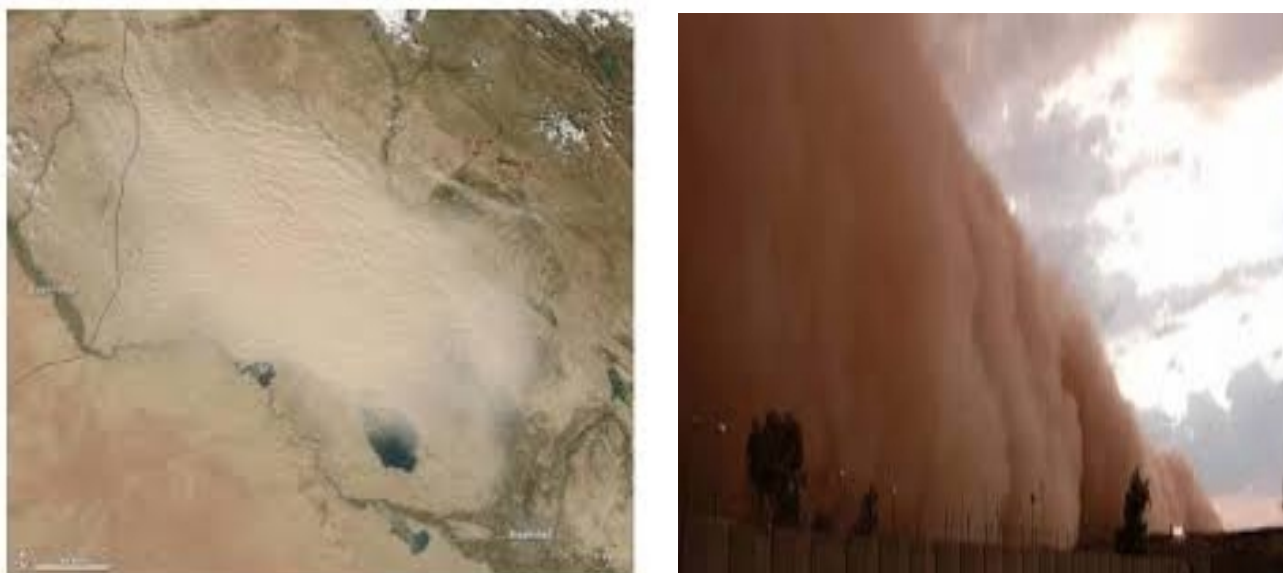


Figure 1: Aerial view of Iraq's dust storm.

In Tikrit in the June residential zone surveillance station, the highest precipitate dust value in 2011 was 97.1 g/m², which was the largest percentage of dust storms in that year. In May 2012, some monitoring stations had a

maximum value of 117,6 g/m². In November 2011, the lowest dust amount was 8.5 g/m² and in January 2012 it was 6.9 g/m² [29].

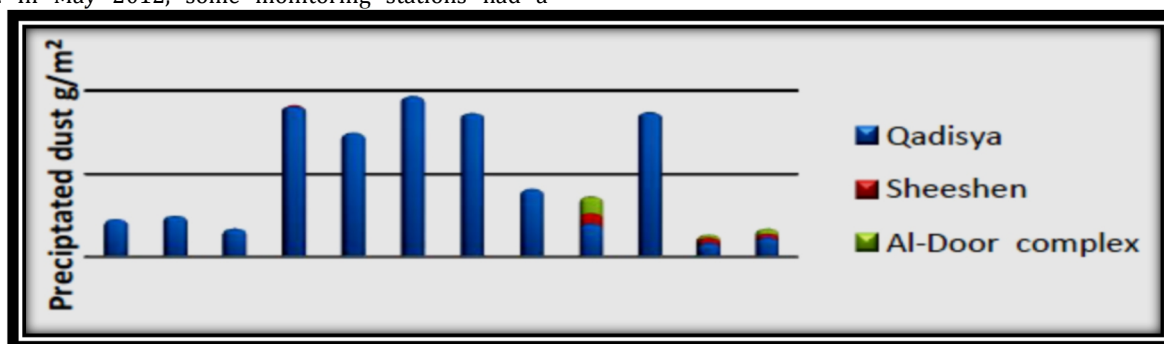


Figure2: Dust full Precipitate amounts in Salah-Al-Din 2011

In the selected study area, heavy dust contamination was found because the area produces large quantities of aggregates. The contamination is caused by sand on the crop. Some labeled plants were sometimes noted to investigate the impact on plant life of dust fall. In the observations, significant variations in their physical appearance were noticed by the trees. Figure No.1, showing the difference between the exterior appearance of Nigadi Pradhikaran Pune's plant and the plants which

were exposed to strong dust in the region of study collection, shows the high dust falling on the plants. Vegetation loss has been observed nearby shredding plant Dust contamination has impacted many plants as dust is accumulated on the vegetation and created a hard layer as the atmosphere has changed. The harsh layer of dust particles is immune to the growth of the trees in Fig 3.



Figure 3: Showing Plants Impact on vegetation of dust pollution,

The plant in selected field of research shows in Figure No. 2 heavy dust emission. Dusty plants have been seen and lost their green leaves with wounded stalks. Much trees were destroyed by dust storms caused by big dust and

quick wind. The green surfaces of plant leaves were covered by particles of dust, as shown in Figure 2. Owing to the accumulation of dust in plant leaves, pigment degradation has been observed. These effects lowered the

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photosynthesis rate. Leaves on vine. The dust fall shaped reduced the body of the plant's growth. The plants which are exposed to this polluting region remain deposited with enormous dust. Insects and other micro-organisms that have cut their food plants have protected dust particles accumulated on the plant body. The increased dust fall for vegetation that reduces green grass growth in the area. The green field was dried out by dust particles



Figure 4: Showing plants fully covered with dust

CONCLUSIONS

Dust can also intensify additive stresses, like drought, insects and diseases, or make toxic metals and fibrous gas contaminants to penetrate. Dust effects can change the competitive balance between species in a community on natural communities. The chemistry of substrates (soil or bark) can be altered and changed. Equilibrium of calcicols and calcifuges. These impacts in vegetation could have an effect on animal populations, ranging from vertebrate grazers to another soil invertebrates. And in turn may illustrates the effects of emissions from dust on plants. Study as the vegetation in the study area has been decreased. The creation of a dust layer on the tissue of the plant damages body that can minimize photosynthesis rates. Pigmentation of the plant leaves is decreased due to the particles. The decline in dust from open soil decreases its fertility. Deposition of dust particles stresses plant production, decreasing plant productivity. Crushing practices are largely responsible for deforestation and worldwide depletion of green space. To avoid degradation of the forests, preventive measures are necessary. Further research is required to reduce the effects on living beings of dust contamination.

Storms of dust and dust affect very serious effects economy, transport and other human beings Public activities. - Social events. The government should mitigate the storms of dust. Iraq's water supplies are handled prudently. Unconventional water supplies (water storage, waste disposal Water) and new suitable water saving should be implemented Methods of irrigation shall be applied.

Recommendations

- The need to further study the factors that affect precipitated pollution such as precipitation And other variables in the environment.
- Qualitative analyzes of heavy metal and other chemicals dust samples analysis of contaminants.
- Raise the number of stations to obtain more accurate findings and data.

produced from vegetation. Many leaf green cells were harmed by dust particles accumulation. Damaged leave cells display yellow and brown areas. Development of such patch was found to be harmful to the pigmentation of plant leaves. The photosynthesis rate depends on the presence of chlorophyll in plant cells. Cell loss affects the photosynthesis rate and growth rate of the affected plant.

- Attention and a lot of green belts and winds around the cities

ACKNOWLEDGMENTS

We would like to acknowledge the anonymous reviewers for their valuable suggestions

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