



EFFECT OF CARBON DI SULPHIDE ON GERMINATION OF RABI CROP OF NAGDA TOWN

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ABSTRACT

Carbon disulfide is a colorless volatile liquid with the formula CS₂. The compound is used frequently as a building block in organic chemistry as well as an industrial and chemical non-polar solvent. It is widely used in the synthesis of organosulfur compounds and is commonly used in the production of the soft fabric viscose. Carbon disulfide evaporates rapidly when released to the environment. Carbon disulfide does not stay dissolved in water very long, and it also moves quickly through soils. Soil pH directly affects the life and growth of plants because it affects the availability of all plant nutrients. Between pH 6.0 to 6.5 most plant nutrients are in their most available state. In present study the rate of germination of rabi crop was monitored. Black cotton soil from different areas of Nagda town was taken for germination of sample seeds. The study was focused on different field of Nagda. It was found that the field of Nagda town was not appropriate for seed germination. Rate of germination was found poor in comparison to other field.

Keywords:

Carbon disulfide, Rabi, Germination, Soil.

INTRODUCTION

Carbon disulfide is a colorless volatile liquid with the formula CS₂.¹⁻¹⁰ the compound is used frequently as a building block in organic chemistry as well as an industrial and chemical non-polar solvent. It has an "ether-like" odor, but commercial samples are typically contaminated with foul-smelling impurities, such as carbonyl sulfide. Compared to CO₂, CS₂ is more reactive toward nucleophiles and more easily reduced. These differences in reactivity can be attributed to the weaker π donor-ability of the sulfido centers, which renders the carbon more electrophilic. It is widely used in the synthesis of organosulfur compounds and is commonly used in the production of the soft fabric viscose. At high levels, carbon disulfide may be life-threatening because it affects the nervous system. Significant safety data comes from the viscose rayon industry, where both carbon disulfide as well as small amounts of H₂S may be present. Carbon disulfide breaks down into other chemical substances after it enters the body. Medical tests can measure levels of these substances in urine and blood, but the tests are not reliable indicators of total exposure.

Acute (short-term) ecological effects: Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen two to four days after animals or plants are exposed to a toxic chemical substance. Carbon disulfide has moderate acute toxicity

to aquatic life. No data are available on the short-term effects of carbon disulfide to plants, birds, or land animals.

Chronic (long-term) ecological effects: Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure to a toxic chemical. Carbon disulfide has high chronic toxicity to aquatic life. No data are available on the long-term effects of carbon disulfide to plants, birds, or land animals.

ENTERING THE ENVIRONMENT

Carbon disulfide evaporates rapidly when released to the environment. Carbon disulfide does not stay dissolved in water very long, and it also moves quickly through soils.

Carbon disulfide reacts with the hydroxyl (OH) radical in the atmosphere, with the effective rate constant depending on O₂ concentration and total pressure. Based on the literature rate constant at one atmosphere of air, the calculated half-life of carbon disulfide due to its reaction with the OH radical are about 8 days. Its reaction products include carbonyl sulfide and sulfur dioxide

Carbon disulfide is non-persistent in water, with a half-life of less than 2 days. About 99.8% of carbon disulfide will eventually end up in air; the rest will end up in the water.

Nagda is a city in Ujjain district in the Indian state of Madhya Pradesh. It is an industrial town in the Malwa region of western Madhya Pradesh and is situated on the bank of Chambal River.

Nagda is a major industrial town having manufacturing unit of Viscose fiber, thermal power plant and a chemical plant,

.Fertile black soils are found in the Malwa Plateau Agriculture is the basis of Madhya Pradesh's economy. The most important crops are wheat, sorghum (jowar), corn (maize), rice, and pulses (legumes such as peas, beans, or lentils) wheat and sorghum are more important. The state is one of the largest producers of soybeans in India. Other crops include linseed, sesame, sugarcane, and cotton, as well as various millets, which are grown in hilly areas. The black soils found in the lava-covered areas are the most conspicuous. These soils are popularly known as "black cotton soils, Because of their high clay content, black soils develop wide cracks during the dry season, but their iron-rich granular structure makes them resistant to wind and water erosion. They are poor in humus yet highly moisture-retentive, thus responding well to irrigation

Soil pH directly affects the life and growth of plants because it affects the availability of all plant nutrients. Between pH 6.0 to 6.5 most plant nutrients are in their most available state. A nutrient must be soluble and remain soluble long enough to successfully travel through the soil solution into the roots. Nitrogen has its greatest solubility between soil pH 4-8. Above or below that range, its solubility is seriously restricted. Soil acidity or alkalinity is very important because it has effect on the decomposition of mineral rock into essential elements that plant can use. It also changes fertilizers from their form in the bag to a form that plants can easily uptake. Soil micro-organisms that change organic nitrogen (amino acids) to the ammonium form of nitrogen to the nitrate form that plant can use also depends on the soil pH. In present study the rate of germination of Rabi crop was monitored. Black cotton soil from different areas of Nagda town was taken for germination of sample seeds .The study was focused on different field of Nagda. It was found that the field of Nagda ground was not appropriate for seed germination. Rate of germination was found poor in comparison to other field.

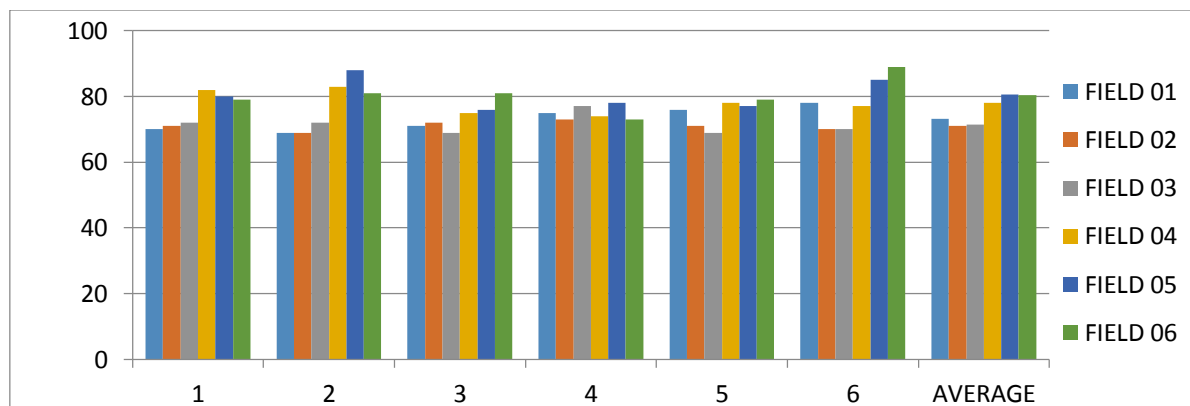
METHODOLOGY

In present study the rate of germination was monitored by the comparing the field of Nagda which are near the exposure of carbon di sulphide and the field of remote area. Different sample were taken and they were given no 1 to 6 and the rate of germination were monitored in different field. Field no 1,2 and 3 were the fields those were near the exposure of CS₂ & field NO 4,5& 6 were situated in remote area.

RESULTS AND DISCUSSION

% RATE OF GERMINATION OF DIFFERENT FIELD

SAMPLE	FIELD 01	FIELD 02	FIELD 03	FIELD 04	FIELD 05	FIELD 06
1	70	71	72	82	80	79
2	69	69	72	83	88	81
3	71	72	69	75	76	81
4	75	73	77	74	78	73
5	76	71	69	78	77	79
6	78	70	70	77	85	89
AVERAGE	73.16	71	71.5	78.16	80.66	80.33



It was found that the % rate of germination was good enough of the field of remote area that is field no 4,5and 6 . The soil of these fields are more fertile than those of situated near the exposure of CS₂ field no 1,2 and 3.

CONCLUSION

Our country is developing nowadays .Industries are the major part of development. Increase in population jobs are also needed .Industries are providing the jobs but some environmental issues are there. In present study the effect of carbon di sulphide on the rate of germination was studied and it was found that the fields of Nagda town were not appropriate for seed germination. Rate of germination was found poor in comparison to other field.

RECOMMENDATIONS

There should be a policy regarding the pollution. Rate of release of carbon di sulphide should be minimize to improve the entire environment.

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