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Research

Chlorosis on Nasturtium (*Tropaeolum majus*) Due to Deficiency of Water and Nutrients

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Abstract

Chlorosis is natural phenomenon observed in Nasturtium (*Tropaeolum majus*) after one month growth. This herb is soft and growth rate is high. Due to rapid cell division length of this herb is at least one ft. Yellowish of leaves and fall of leaves due to scarcity of water. Weight of soil is same ,where as weight of the plant is now increased a lot. Pouring of water twice helps to recover from chlorophyll ($C_{55}H_{72}MgN_4O_5$) loss. Chlorophyll is electron receiver since morning sunshine. (Photon). Compacted roots are another reason for chlorosis.

Keywords: Nasturtium; Photon; Chlorophyll; compacted roots

Introduction

Germany is the pioneer country who discovered Nasturtium as medicinal herb in the year of 2013. Further research work helps to enhance this herb in pharmacy. Those who loves to maintain garden they like to grow to see this plant for their flower. Whole plant is edible and flower is also rich source of β-carotene if you eat in salad and soup [1]. When it grows in a confined pot, after one month it needs more water in 24 hours to maintain it's chlorophyll content [2]. Due to lack of water it turns yellow in certain leaves [3].

Material and Methods

Few seeds grows in a small earthen pot and Nasturtium plants germinates within 3 days after pouring water. Moist soil with air and sun shine grows naturally and increases it's leaves and stems. In second month too new leaves are visible and trailing stem increases it's length [4,5]. Only once we pour water at 4-5 pm then certain leaves turn yellow , chlorosis appears and stem also dried in certain part. So scarcity of water is the cause and we changed pouring water In the morning too we pour water at 9 a.m. it helps to recover from chlorosis [6,7].

Figure 1.

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Figure 2.

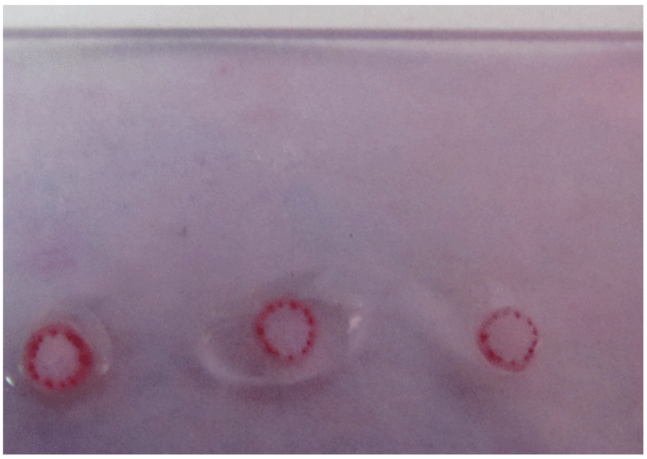

Figure 3.

T.S of Stem (*Tropaeolummajus*) showing xylem oriented peripherally.

Water conducting tissue (Xylem oriented peripherally) clearly visible peripherally after putting a small branch of stem in water with eosin stain and keep for 6 hours and take sections shows this arrangement of xylem as it's only water conducting tissue which suck water molecule by this tissue [8]. Nutrients are soluble in water and supplies to different cells (Leaves and stem) via roots from soil [9]. Amount of water to reach in leaves (specially chlorophyll) helps to prepare food ($C_6H_{12}O_6$) for plants.

Observation

After growth of plant (1 ft.) few leaves turns yellow due to lack of chlorophyll. Different nutrients (Fe, Na, K. Mn, Mg, N) also carried by water molecule to reach in leaves. Applying water twice daily helps to recover from chlorosis. Amount of water if less in fix amount of soil in a small pot it will not be able to produce food and chlorosis appears.

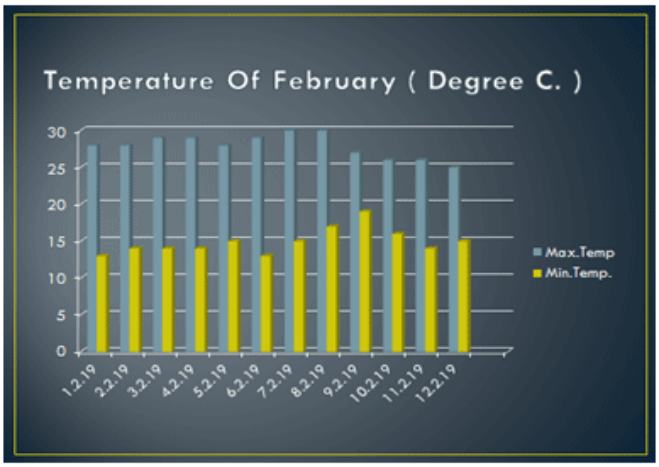

Figure 4.

Temperature of environment is indirectly proportional to soil moisture. If temperature increases moisture content of soil will decreases.

DATE	MAX	MIN
1.2.2019	28°C	13°C
2.2.2019	28°C	14°C
3.2.2019	29°C	14°C
4.2.2019	29°C	14°C
5.2.2019	28°C	15°C
7.2.2019	30°C	15°C
8.2.2019	30°C	17°C
9.2.2019	27°C	19°C
10.2.2019	26°C	16°C
11.2.2019	26°C	14°C
12.2.2019	25°C	15°C

TABLE-1 Temperature in February

Result and Discussion

Plants require sufficient water molecule to prepare food in leaves. Chlorophyll pigment in leaves helps to start breaking of water molecule by the help of photon from Sun. H^+ and (OH^-). From roots to leaves water transports through xylem tissue. With other nutrients (mineral and micro) it helps to prepare food. Chlorosis appears if sufficient water didn't hold by soil particle. So pouring water twice will improve the plant growth. Temperature during day time helps active

transport as density difference in cells are there. From roots to leaves water reaches. If more water are there transpiration through stomata helps to suck more water.

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