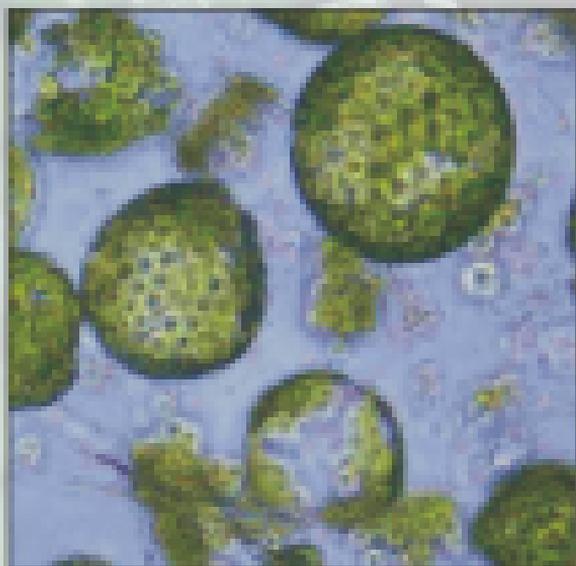


Plant Ecophysiology

A Glossary

Nafees A. Khan
R.M. Agarwal



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I.K. International Publishing House Pvt. Ltd.

New Delhi • Bangalore

Published by

I.K. International Publishing House Pvt. Ltd.

S-25, Green Park Extension

Uphaar Cinema Market

New Delhi-110 016 (India)

E-mail: info@ikinternational.com

Website: www.ikbooks.com

ISBN 978-93-81141-15-1

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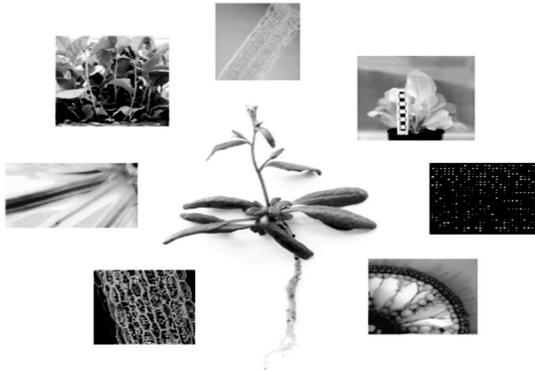
Published by Krishan Makhijani for I.K. International Publishing House Pvt. Ltd., S-25, Green Park Extension, Uphaar Cinema Market, New Delhi-110 016 and Printed by Rekha Printers Pvt. Ltd., Okhla Industrial Area, Phase II, New Delhi-110 020.

Preface

Many standard textbooks are available dealing with the different aspects of plant physiology and ecophysiology which, however, are very large and exhaustive. *Plant Ecophysiology: A Glossary* will allow the students with an instant access to important terminology. For many topics and aspects related to plant ecophysiology, the students may find the book as a 'ready reckoner'/a useful revision aid and a stimulus for further study. The book is a comprehensive and self-contained work. The book has been prepared with an objective to be of use both for a layman and to a professional, however, in no way act as a replacement for specialist treatises. Authors shall welcome constructive criticism and shall put an effort to overcome the lapses and omissions in future.

We would like to thank our families for forbearance during the preparation of the book and our students, interactions with whom for around three decades have helped us understand the subject.

AUTHORS



Abscisic Acid

It is a sesquiterpenoid plant growth substance found in vascular plants. It is a plant hormone that allows a plant to adjust to the outside stress that it may encounter. It mainly acts to inhibit growth, promote dormancy and helps the plant to tolerate stressful conditions. It is so named because it causes the abscission of leaves from deciduous trees in the fall. It is also called dormin as it causes bud dormancy. In liverworts lunularic acid, a compound similar to ABA seems to play physiological role similar to that of ABA in higher plants.

Abscission

It is the shedding of a plant part. It refers to intentional dropping of one or more plant parts, such as leaf, fruit, flower or seed. Abscission occurs after the formation of an abscission zone, a thin layer of cells. The abscission layer becomes weak and breaks by converting pectic acid to pectin. Abscission process primarily seems to be regulated by ethylene and auxins suppress the ethylene effect. Nevertheless, greater auxin concentration may stimulate ethylene production.

Absolute Growth Rate

It is the dry matter accumulation (or energy content) per plant in unit time interval.

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Absolute Temperature

It is the temperature measured in Kelvin from absolute zero. It is calculated on an absolute scale. Absolute temperature scale includes Kelvin and Rankine. The Kelvin scale is also called Absolute temperature and Kelvin is the SI unit for temperature. In this temperature scale $0^{\circ}\text{C} = 273.15\text{ K}$.

Absorption Spectrum

This is the absorption of different wavelengths by a molecule/substance. The intensity of the radiant energy at each wavelength gives the measure of the amount of energy at that wavelength. The absorption of radiation is measured with spectrophotometer when light passes through a selected absorbing substance.

Accessory Pigments

These are the pigments associated with both antenna and reaction centre pigment proteins and help in the transfer of absorbed energy to reaction centre during photosynthesis.

Acclimation

Acclimation or acclimatization is the adjustment to adverse condition. Plants that are continuously exposed to adverse conditions become tolerant compared to plants of same species that are not subjected to such adverse conditions. Acclimation of plant is important in agriculture. Generally, acclimation is distinguished from adaptation, which is used to indicate genetically determined level of tolerance.

Acid Growth Hypothesis

It is used to explain the rapid growth effects caused by auxin. The hypothesis states that auxin action causes H^+ ions accumulation, lowers the wall pH causing wall loosening and subsequently cell elongation and growth

occurs. Generally cell walls extend much faster at acidic pH. At times auxin-stimulated cell elongation is attributed to increased proton extrusion and lowering of pH. The proteins named expansins have been implicated in pH-dependent extension of cell walls.

Acid Rain

It refers to the rain that contains oxides of nitrogen and sulphur. As a result of pollution, the oxides of nitrogen and sulphur are transformed into moist secondary pollutants such as sulphuric acid, ammonium nitrate and nitric acid that fall as rain, snow or fog. This rain is called acid rain. The transformation of these pollutants occurs because they can be transported to long distances and so can occur at places far away from the site of origin. Acid rain is harmful as it affects life on both land and water.

Acid Soil Complex

Acid rains contribute acid to soil. In soils which lack calcium carbonate plants are more adversely affected by these acids. Aluminium and/or manganese toxicity resulted under calcium deficiency conditions can be prevented by liming.

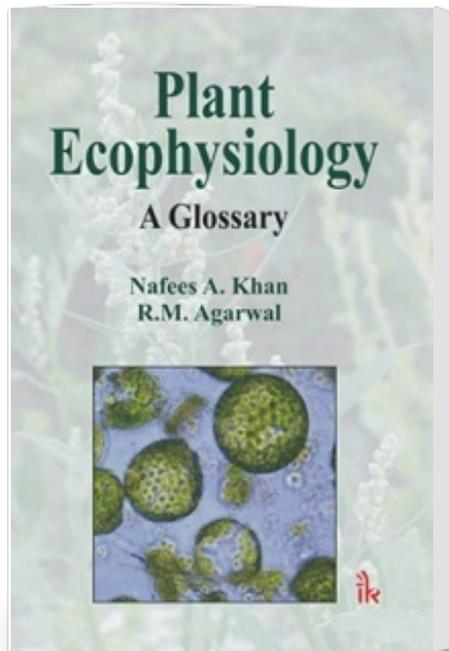
Acid Value

Number of halogens absorbed by 100 g of oil is referred to as acid value.

Acidic Soil

Soils that have pH less than 7 are said to be acidic soils. In such a soil aluminum and manganese can become so soluble so as to reach toxic level. Highly acidic soil loses cations rapidly and so becomes relatively poor. Soil can be acidic depending on the nature of original rock but rainfall is a determining factor in describing the nature of soil.

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Publisher : IK International

ISBN : 9789381141151

Author : Nafees A. Khan

Type the URL : <http://www.kopykitab.com/product/7216>



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