





<https://vizle.offnote.co>

Contact us: vizle@offnote.co

This document was generated automatically by **Vizle**

Your **Personal Video Reader Assistant**

Learn from Videos **Faster** and **Smarter**

VIZLE **PRO / BIZ**

PDF, PPT ~~Watermarks~~

- Convert *entire* videos
- *Customize* to retain all essential content
- Include Spoken *Transcripts*
- Customer support

Visit <https://vizle.offnote.co/pricing> to learn more

VIZLE **FREE PLAN**

PDF only ~~Watermarks~~

- Convert videos *partially*
- Slides may be *skipped**
- Usage restrictions
- No Customer support

Visit <https://vizle.offnote.co> to try free

Login to Vizle to unlock more slides*

Arnon and Stout 1939

What makes an element essential for plants?

1. Must be required for the completion of the life cycle of the plant.
2. Must not be replaceable by another element.
3. Must be directly involved in plant metabolism, that is, it must be required for a specific physiological function.



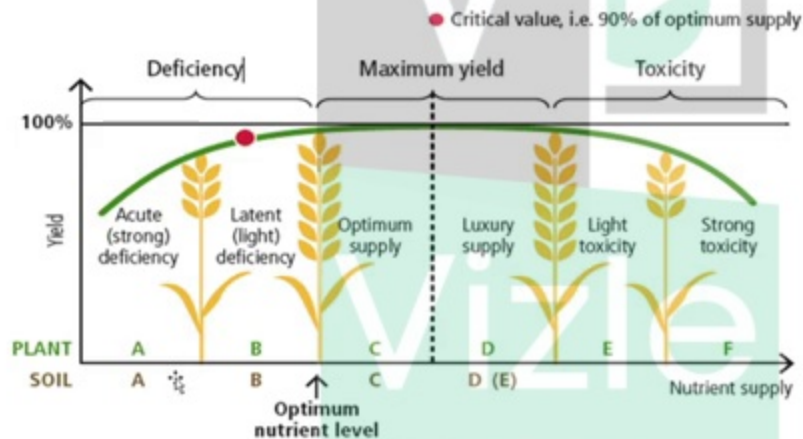
P.R. Stout



Daniel I. Arnon
*November 14, 1910 —
December 20, 1994*



Deficiency, optimum and toxicity



Why is Soil Nitrogen important?

- Nitrogen in plant physiology
 - Amino acids and proteins
 - DNA and RNA

PRIMARY MACRONUTRIENTS

7
N

NITROGEN

15
P

PHOSPHOROUS

19
K

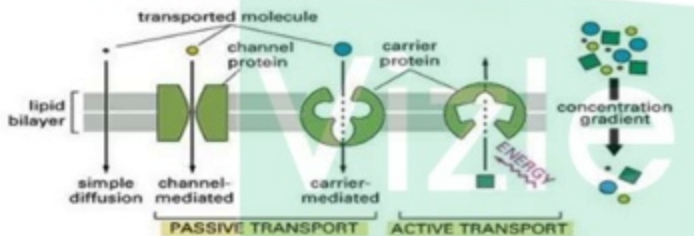
POTASSIUM



Vizle Nutrient uptake by plants

Passive Uptake of Ion Absorption:

- Non-Mediated Passive Uptake: Diffusion; Ion Exchange; Mass Flow of Ions:
- Mediated Uptake (Specificity and Saturation effects):
 - Passive Mediated Transport: ionophores (K); carriers; Ion Channels;





<https://vizle.offnote.co>

Contact us: vizle@offnote.co

This document was generated automatically by **Vizle**

Your **Personal Video Reader Assistant**

Learn from Videos **Faster** and **Smarter**

VIZLE **PRO / BIZ**

PDF, PPT ~~Watermarks~~

- Convert *entire* videos
- *Customize* to retain all essential content
- Include Spoken *Transcripts*
- Customer support

Visit <https://vizle.offnote.co/pricing> to learn more

VIZLE **FREE PLAN**

PDF only ~~Watermarks~~

- Convert videos *partially*
- Slides may be *skipped**
- Usage restrictions
- No Customer support

Visit <https://vizle.offnote.co> to try free

Login to Vizle to unlock more slides*