



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Ain Shams University Information Network

جامعة عين شمس

شبكة المعلومات الجامعية
@ ASUNET



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%



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التوثيق الالكتروني والميكروفيلم

وثائق لم ترد بلاصل

بعض الوثائق
الأصلية تالفه

يصعب قراءة بعض الوثائق

Dynamics of ion transport for some nutritional elements in plant

By

Gehan Hossny Youssef

B. Sc. Agric. Sci. (Soil Science), Ain Shams University, 1986

M. Sc. Agric. Sci. (Soil Science), Ain Shams University, 1993

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of

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Faculty of Agriculture

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Approval sheet

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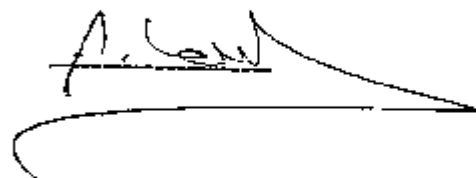
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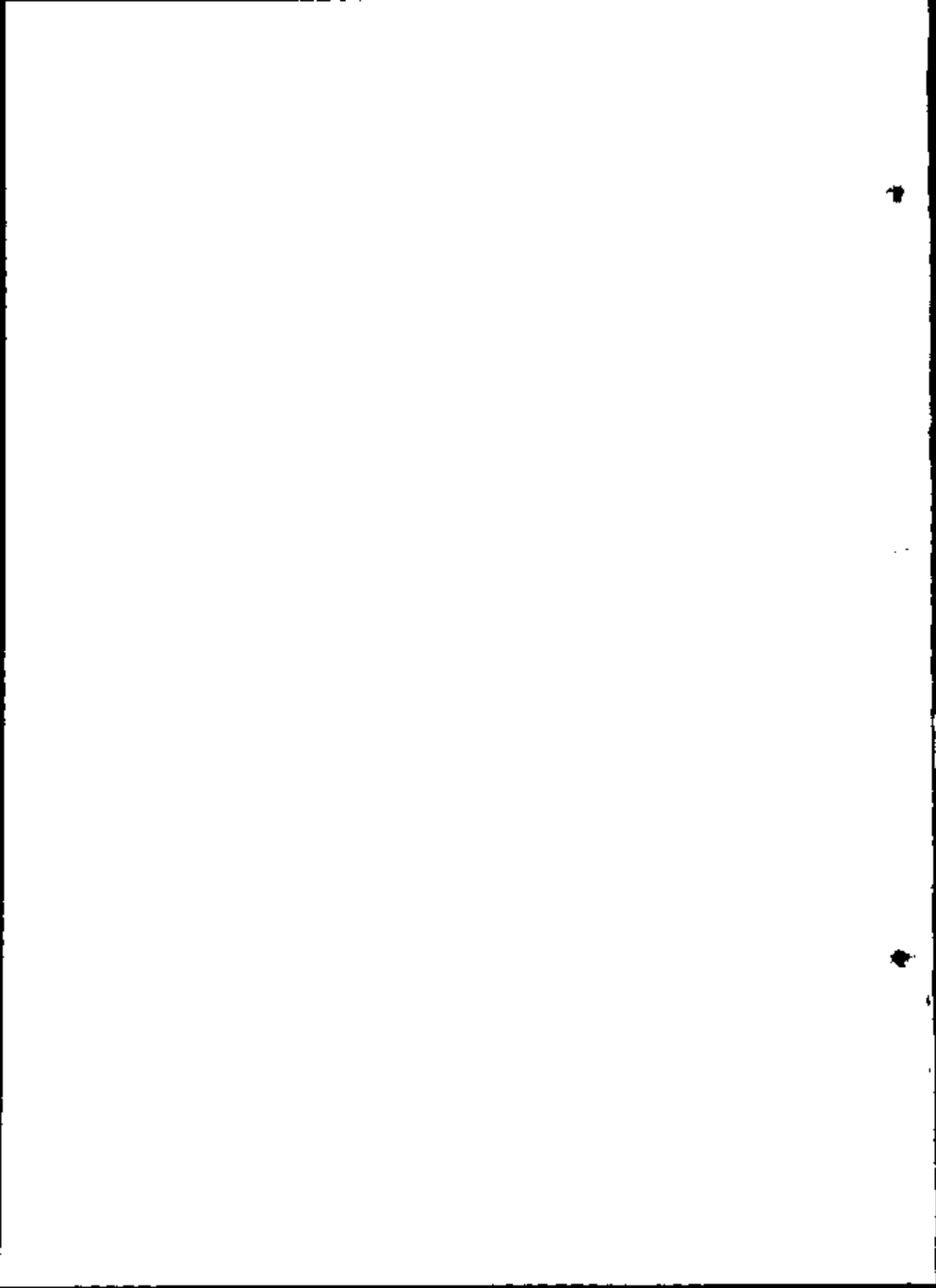
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Abstract

Gehan Hossny Youssef. Dynamics of ion transport for some nutritional elements in plant. Unpublished Doctor of philosophy Dissertation, Ain-Shams University, Faculty of Agriculture, Department of Soil Science, 2001.

Two main series of experiments were carried out to evaluate the possibility of understanding the regulation mechanisms of both ammonium and nitrate utilization by barley plants to be then used in exceeding efficiency of nitrogen nutrition by plants. The first experiment series (preliminary experiments) included two experiments performed to select seedlings having varied different nitrogen concentrations throughout prefed with different nitrogen concentrations of either nitrate or ammonium form of nitrogen and durations for such pretreatment. The second series (uptake experiments) included two experiments the first was to evaluate the net flux and kinetic parameters V_{max} and K_m for both ammonium and nitrate uptake by excised barley roots of the previously selected nitrogen prefed seedlings under different conditions of nitrogen nutrition of either nitrate or ammonium. The second experiment was to complete the picture of factors affecting nitrogen (ammonium or nitrate form) uptake by the studied selected seedlings, responses to internal different nitrogen components in root tissues was statistically evaluated through evaluating the share of each parameter in the final output of the indicated uptake of nitrogen.

Data obtained from the first experiment indicated that dry matter content, representing growth, of the studied barley seedlings had no appreciable response to external nitrogen nutrition.

Status of nitrogen forms in the studied seedlings showed a positive response to nitrogen treatments (both concentration and time of prefeeding) in both experiments.

Correspondent results obtained from the second experiment indicated that accumulation of either ammonium or nitrate in the studied roots increased with time progress; an opposite trend was observed for nitrogen uptake starting

from 15 min time interval, values being dependent on the nitrogen form and time interval of nutrition. Accumulation of nitrate seemed to be generally higher than that of ammonium.

With regard to mechanics of ion absorption by the concerned excised roots, data generally showed that two mechanisms were present in the absorption medium. Both V_{max} and K_m parameters were evaluated as an expression for kinetics of absorption by roots whose values were gradually increased by increasing prefed concentrations dependent on nitrogen form of nutrition and duration of prefed time interval. Values of V_{max} parameter for both ammoniacal and nitrate forms of nitrogen were generally responded negatively to absorption time interval, an opposite trend being observed for K_m parameter whose values were positively responded.

Regarding the response of nitrogen uptake dynamics to internal nitrogen components of root tissue, for ammonium-prefed plants, both ammonium and nitrate internal contents of the studied roots, were generally related to both kinetic parameters of nitrogen uptake. Indicated parameters seemed to be responded positively to ammonium but negatively to nitrate content at the 15 min absorption period, as absorption time goes on, nitrate internal content, opposite to ammonium content, started to be stimulative at least at 180 minute time interval. For nitrate-prefed plants, on the other hand, similar to ammonium-fed plants, internal inorganic nitrogen content of the studied roots had a pronounced effect on both studied parameters of N uptake kinetics.

Finally, regardless of the nitrogen fed form, it could be concluded that equations representing responses of both V_{max} and K_m for the uptake of both ammonium and nitrate proved that the internal inorganic nitrogen content of the studied roots, among all studied internal components, was the most effective factor.

Key word: Ion uptake, Uptake kinetic parameter, Ammonium nutrition, Nitrate nutrition, Nitrogen form, Amino acids, Total nitrogen.

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