



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Ain Shams University Information Network
جامعة عين شمس

شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام 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%

بعض الوثائق الأصلية تالفة



بالرسالة صفحات نم ترد بالاصل

**DEVELOPING OF CENTER PIVOT IRRIGATION
SYSTEM FOR CHEMICALS SPRAYING**

BY

AHMED ZAHIR ELSAYED MARZOUK DOUKHAN

B. Sc. (Agric. Mech.), Fac of Agric., Ain Shams University, 1991

A Thesis submitted in partial fulfillment

of

the requirement for the degree of

MASTER OF SCIENCE

in

Agricultural Science

(Agricultural Mechanization)

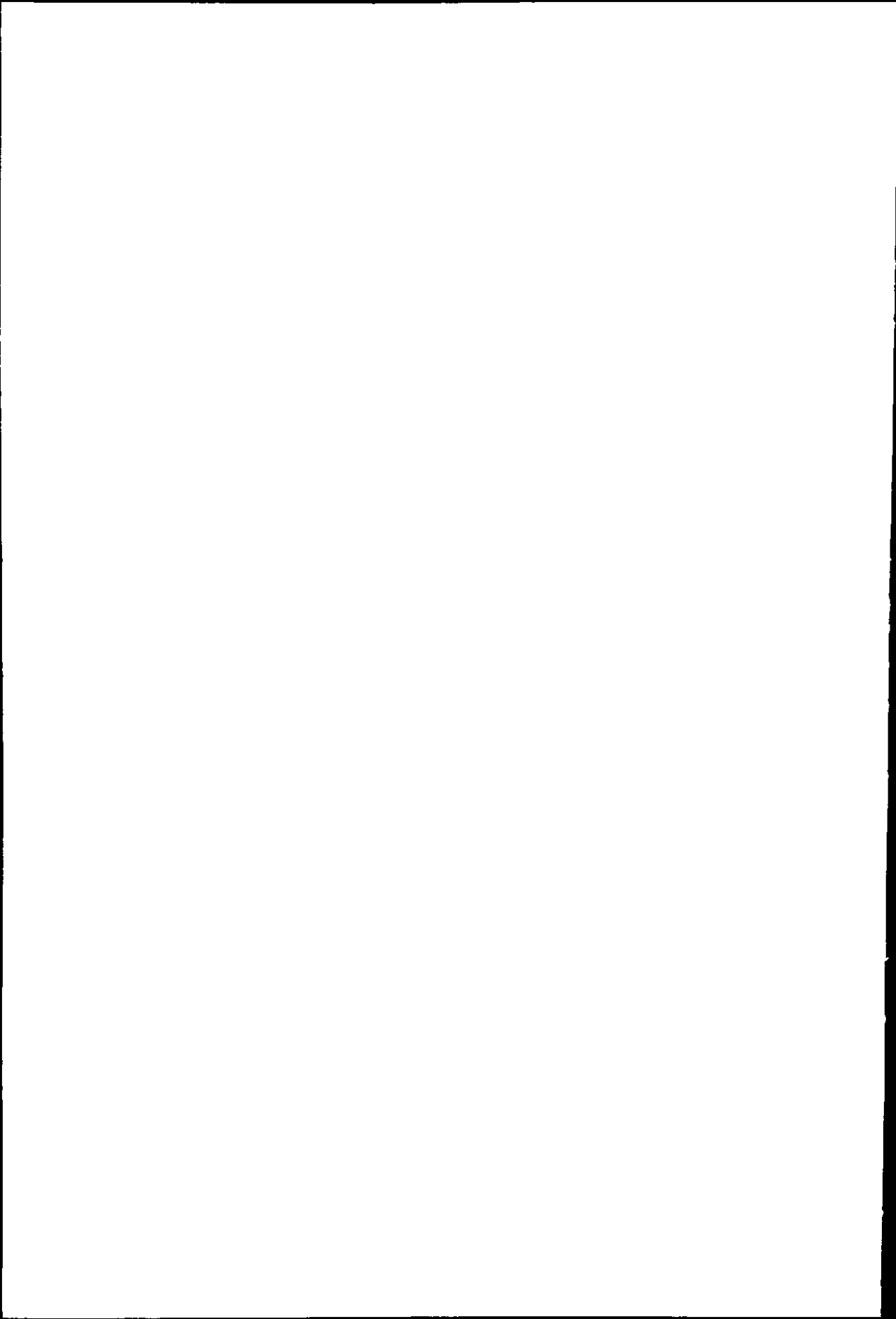
Department of Agricultural Engineering

Faculty of Agriculture

Ain Shams University

2000

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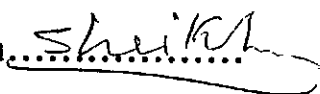
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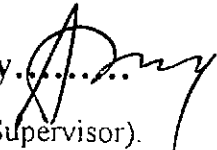
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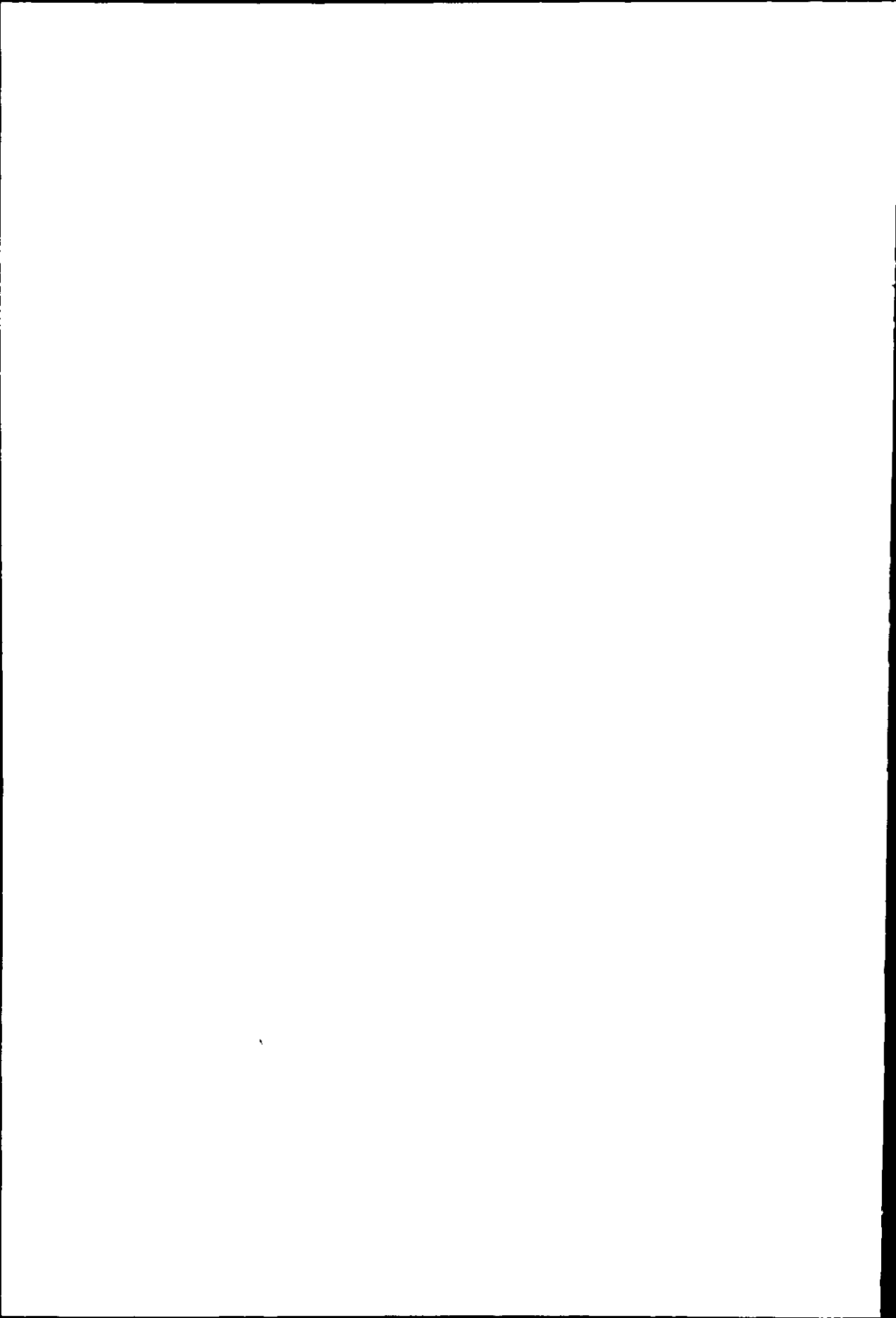
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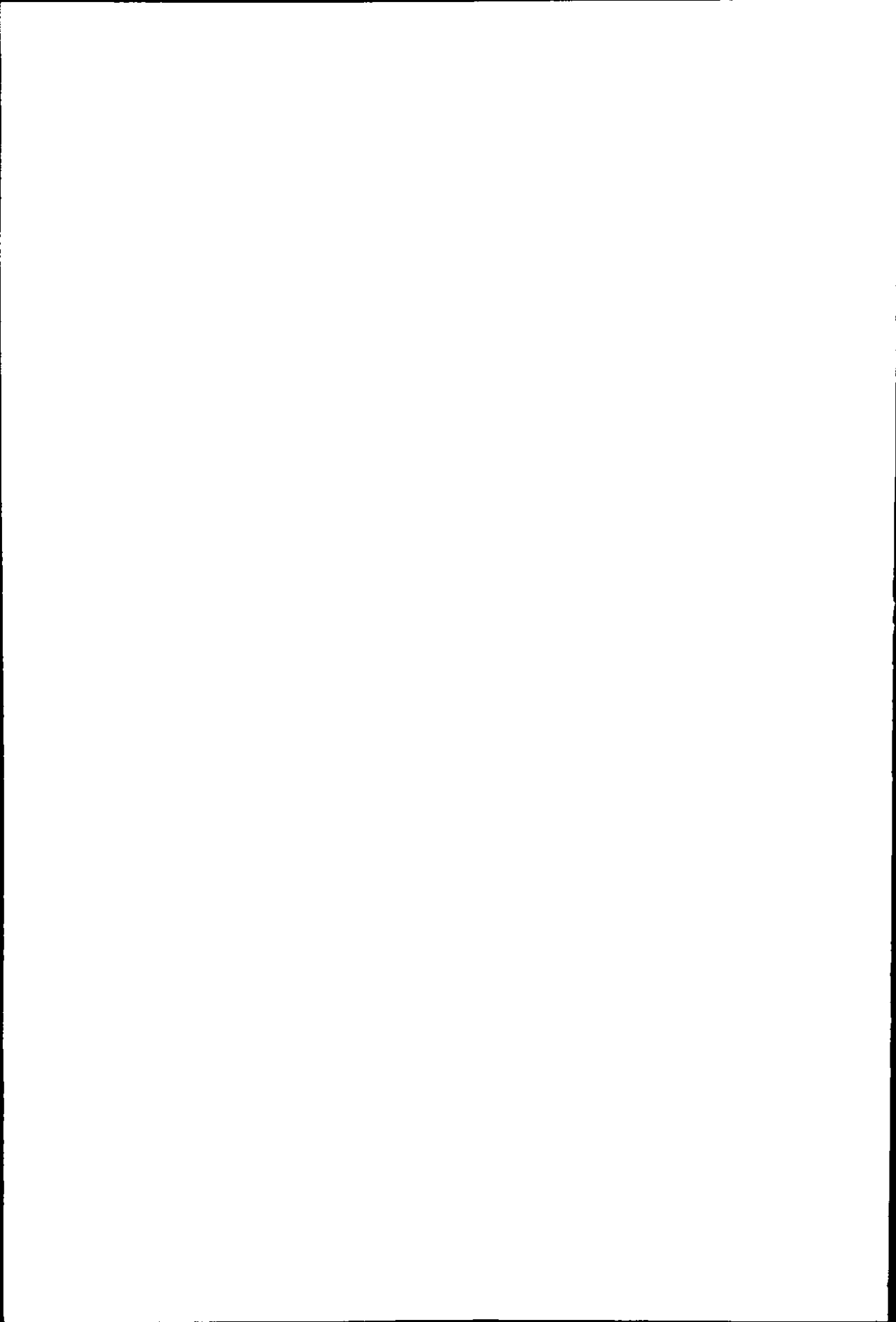
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ABSTRACT

Ahmed Zahir Doukhan. Developing of center pivot irrigation system for chemicals spraying. Unpublished Master of Science Thesis. University of Ain Shams. Faculty of Agriculture. Department of Agricultural Engineering, 2000

A simple pivot attached sprayer system (PASS) was designed through National Agricultural Research "NARP" Project titled Improving the Efficiency and Environmental Benefits of Fertigation/Chemigation on Field and Vegetable Crops with Sprinkler and Micro Irrigation No. A 006. It installed on a single-tower center pivot irrigation system. The spray boom was 40-m length and 25 mm dia. The sprinkler risers were 8-mm dia. A variable space design is used. Three sizes of the micro sprinkler, spinner-type (0.81, 0.94 and 1.16 mm dia.) were selected. The spacing between sprinklers was varied from 2.4 to 4.1 m. At 138 kPa sprinkler pressure and 900 liter / Feddan application rate, the PASS inlet pressure head was 20.6 m, and the power requirement (without agitation) was 0.03 kW. A centrifugal pump (0.94 kW) has been used which had additional capacity and pressure (8.3 m³/hr, 4 bar) for hydraulic agitation and future applications that need more power requirements.

At (69, 103, 138 and 172 kPa) sprinkler operating pressure, the PASS average droplet size, along spray boom, was less than 400 µm and it might be classified as medium spray.

The uniformity of the application profile was acceptable except near the pivot point where the results indicated that there was a need to change the size and spacing of the micro sprinklers near the pivot point to get less flow rate and more amounts of overlap to coincide with the travel velocity at the region near the pivot. The deposition distribution of the PASS (qualitative

examination) at 138 kPa sprinkler operating pressure and (75 and 100 cm) height over the Faba bean canopy (the average length of Faba bean was 130 cm and the plant density was 30 plants/m²) showed that the 75 cm height of spray boom gave higher amount of deposits on the upper and lower surface and higher intensity ratio (in the order of 5.65:1) than 100 cm height of the spray boom.

Key words: Sprayers, Pesticides, Irrigation, Chemigation, Center pivot.

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