

## ABSTRACT

**Hoda Mohamed Gamal El-Shaboury "Bio-agriculture of some economical leguminous crops in newly reclaimed desertic soil". Unpublished Doctor of Philosophy Dissertation. Dept. Agric. Sci., Institute of Environmental Studies and Research, Ain Shams University, 2002.**

Field experiments for cultivating faba bean and lentil plants were carried out in two successive seasons (1998/1999 and 1999/2000) in a newly reclaimed soil (Nubaria). The effect of biofertilization using commercial nitrogenous and(or) phosphatic inoculants namely Rhizobacteria and(or) phosphorin, organic manuring using (garbage compost), application of different levels of inorganic N-fertilizer (ammonium sulphate) on the plant growth (plant height, number of branches/plant, root and shoot dry weights, nodulation expressed as number and dry weight of nodules), NPK plant content, dehydrogenase activity in rhizosphere and  $N_2$ -ase activity of developed nodules were periodically determined (40, 70 and 120 days after cultivation). Yield and yield components of both plants (number of pods & seeds/plant, weight of 100 seeds, NPK of seeds) were also estimated at the end of experiments. Heavy metals (zinc, copper, lead and cadmium) were determined in experimental soil, garbage manure, seeds and pod hulls to throw light on their accumulation in the edible plant parts as affected by biofertilization treatments.

Obtained results generally show that using a mixture of rhizobacterin and phosphorin and organic manuring significantly increased plant growth and yield of faba bean and

lentil plants in the presence of reduced level of inorganic N-fertilization, i.e., half the recommended amount can be saved due to the application of such treatment. Accumulation of heavy metals, in most cases, reached their minimal levels in faba bean and lentil seeds and pod hulls by the application of N + P-biofertilizers and organic manuring.

**Key words :** Biofertilizers, Organic manures, Garbage compost, Dehydrogenase, Nitrogenase.

## الموجز

هدى محمد جمال الشابورى ، "الزراعة الحيوية لبعض المحاصيل البقولية الإقتصادية فى الأراضى الصحراوية حديثة الإستصلاح" ، رسالة غير منشورة لدكتوراه الفلسفة من قسم العلوم الزراعية ، معهد الدراسات والبحوث البيئية ، جامعة عين شمس ، ٢٠٠٢ .

أجريت تجارب حقلية لزراعة محصولين (القول البلدى والعدس) خلال موسمين متتاليين (١٩٩٨/١٩٩٩ و ١٩٩٩/٢٠٠٠) وذلك فى أراضى حديثة الاستصلاح (النوبارية) وقد تمت دراسة أثر الأسمدة الحيوية التجارية (الريزوبكتريين والفوسفورين) مع إضافة المادة العضوية (سماد القمامة) وذلك فى وجود جرعات مختلفة من السماد المعدنى (سلفات النوشادر) على نمو النباتات (طول النبات ، عدد الأفرع ، الوزن الجاف للمجموع الخضرى والجذور ، الوزن الجاف وعدد العقد الجذرية ومحتوى النبات من النيتروجين والفوسفور والبوتاسيوم ، كما تم تقدير نشاط إنزيم الديهيدروجينيز فى المنطقة المحيطة بالجذر وكذلك نشاط إنزيم النيتروجينيز فى العقد الجذرية وذلك على فترات (٤٠ ، ٧٠ ، ١٢٠ يوما من الزراعة) كما قدر المحصول لكل نبات (عدد القرون وعدد البذور لكل نبات والوزن الجاف لكل ١٠٠ بذرة ، والمحتوى النيتروجينى والفوسفورى والبوتاسيومى للبذور وتم تقدير العناصر الثقيلة (زنك ، نحاس ، رصاص ، كادميوم) فى التربة وسماد القمامة فى بداية التجارب ، ثم تم تقدير العناصر الثقيلة فى البذور وأغلفة البذور فى نهاية التجارب .

وقد أوضحت النتائج أن استعمال خليط من الأسمدة الحيوية (الريزوبكتريين والفوسفورين) مع المادة العضوية تعمل على زيادة نمو وانتاجية الفول البلدى والعدس فى وجود نصف الجرعة من السماد الأزوتى المعدنى الموصى بها وأن تراكم العناصر الثقيلة تصل الى حدها الأدنى فى البذور وأغلفة البذور لكلا المحصولين .

الكلمات الدالة : لأسمدة الحيوية ، المادة العضوية (سماد القمامة) الديهيدروجينيز ، النيتروجينيز .

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