

Response of Mungbean Yield to Amino Acids and Silicon Spraying

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Abstract. The experiment was conducted in Babylon, Iraq to improve mungbean yield by spraying three levels of each amino acids (control, 4 and 8 ml L⁻¹) and potassium silicate (control, 5 and 10 ml L⁻¹) in randomized complete block design (RCBD) with three replications. Two times of spraying was done (at 30 and 45 days after planting). The results showed that spraying of amino acids at 8 ml L⁻¹ increased plant pods number (23.05 pods), pod seed number (6.50), 500 seeds weight (19.2 g), and seed yield (954 kg ha⁻¹), significantly. Spraying of potassium silicate at the level of 10 ml l⁻¹ caused a significant increase in plant pods number (22.04) and seed yield (853.6 kg ha⁻¹). The factors caused a significant interaction effect and spraying 8 mg l⁻¹ amino acids +10 ml l⁻¹ of potassium silicate achieved the highest plant pods number (23.48), pod seed number (6.68), 500 seeds weight (19.3 g), and seed yield (1005.0 kg ha⁻¹) significantly compared to control treatment.

INTRODUCTION

Mung bean (*Vigna radiata* L.) is a summer legume crop, grown in most of Iraq as a short-season growth crop. It is grown for its high-value seed quality, which uses as a food and a feed crop. Poor plant production potential may be due to saline soil in middle and south Iraqi soil, which is known to cause considerable crop yield losses [1]. The soil is classified as saline soil if its saturated pastes have electrical conductivity more than or equal to 4 dS m⁻¹ [2]. Salt stress was more effective at all mung bean plant growth stages and produce shriveled seeds [3], and its threshold was 1.8 dS m⁻¹ [4].

Amino acids spraying caused an important role in many vital processes that affect plant growth and development, by reducing the effect of salinity stresses through changing the osmotic potential of plant tissue [5]. It has also an important role in the metabolic processes by involving enzyme synthesis and protecting plants from ammonia toxicity and helps when a nutrient deficiency occurs during plant growth [6]. Amino acids spraying at (3 mg L⁻¹) on pea caused an increase in plant pod number, seed weight, and yield [7].

Silicon spraying caused a major role in plant growth and yield, especially at abiotic stresses. It improves the activity of photosynthesis which is reflected in the largest number and weight of seeds [8]. Silicon caused a reduction in disorder damage of the free radical and increased the activity of antioxidants enzyme [9]. Silicon enhances the availability and regulation of the nutrient balance in plants during plant periods [10]. It caused an increase in plant pod number, pod seed number, and yield of broad bean [11]. These previous studies indicated the possibility of improving the productivity of legumes plants when spraying with amino acids and silicon. Therefore, the study was conducted.

MATERIALS AND METHODS