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## Response of Silage Maize (*Zea mays* L.) to Nitrogen Fertilizer after Different Crops in a Semi Arid Environment

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**Abstract:** The use of legume crops in maize rotation systems may decrease the need for nitrogen (N) fertilization and increase total output. The effect of previous crops (wheat, barley, lentil, Hungarian vetch, and fallow) and different N fertilization rates (0, 120, 160, 200, and 240 kg of N ha<sup>-1</sup>) on yield and N content of silage maize (*Zea mays* L.) were evaluated under irrigated conditions in Diyarbakır, Turkey, during the 1999-2000, 2000-2001, and 2001-2002 growing seasons. Dry matter yield varied between 10,068.2 and 16,480.4 kg ha<sup>-1</sup>. It was determined that Hungarian vetch was a suitable rotation crop, and that 200 kg of N ha<sup>-1</sup> was the best N fertilization rate for silage maize production across years and N rates. Moreover, according to the previous crop x N fertilization rate interaction, the highest dry matter yield was obtained from 240 kg of N ha<sup>-1</sup> after barley. Silage maize following Hungarian vetch in rotation did not respond to the application of more than 120 kg of N ha<sup>-1</sup>, in terms of dry matter and N yields, while in barley-maize and wheat-maize these 2 parameters increased in response to every level of N fertilization applied. Additionally, fallow-maize and wheat-maize did not respond to the application of more than 200 kg of N ha<sup>-1</sup>. The legumes showed potential as previous crops that could replace fallow and cereals in silage maize production by reducing the amount of N fertilizer used on silage maize without significantly decreasing dry matter and N yield. Nonetheless, the cereals demonstrated high dry matter yields, based on annual production. According to regression analysis, the highest dry matter and N yields were obtained from the application of 198, 254, 211, 80, and 210 kg of N ha<sup>-1</sup> after previous crops of wheat, barley, lentil, Hungarian vetch, and fallow, respectively.

**Key Words:** Silage maize, yield, N yield, previous crops, nitrogen rate, nitrogen saving, cereal, legume

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