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Effect of Cultivar and Harvest Date on Nitrate (NO_3) and Nitrite (NO_2) Content of Selected Vegetables Grown Under Open Field and Greenhouse Conditions in Jordan

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Abstract

Two cultivars each of spinach, lettuce, cabbage, squash, and cauliflowers, as well as one cultivar of parsley were grown in open fields. In addition, two cultivars each of squash, cucumber, and tomatoes were grown in polypropylene-covered greenhouses. The effects of cultivar and harvest date on the nitrate and nitrite content of the edible parts of these vegetables were studied. Harvest date was found to have a significant effect (Pâ‰¤0.05) on the nitrate content of the open-field-grown spinach, cabbage, and squash, and the nitrite content of the open-field-grown spinach, lettuce, and cabbage.

Late-harvested vegetables had the lowest nitrate levels, while the pattern of their nitrite content was irregular with respect to the dates that gave highest nitrite levels in each vegetable. Harvest date had no significant effect on either nitrate or nitrite content of the greenhouse-grown vegetables.

Cultivar had a significant effect (Pâ‰¤0.05) only on the nitrate content of the greenhouse-grown tomatoes and squash, while it had no effect on either the nitrate or the nitrite content of all other vegetables irrespective of their cultivation method, although their levels in the greenhouse-grown vegetables were higher than those grown in open fields. Nitrate levels in these vegetables were generally low (lowest average of 0.13 mg 100 gâ^'1in open-field-grown cauliflower, and highest of 4.77 mg 100 gâ^'1in greenhouse-grown squash). Nitrite levels, on the other hand, were similar to those reported elsewhere in the world, ranging from non-detectable levels in open-field-grown cauliflower, to a maximum level of 0.43 mg 100 gâ^'1in greenhouse-grown squash.

A highly significant, although low, positive correlation (r=0.55, Pâ‰¤0.01, n=108) was found between nitrate and nitrite contents of the greenhouse-grown vegetables, compared to a non-significant, and much lower correlation between the two variables in the open-field-grown vegetables.

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Keywords

nitrite; nitrate; vegetables; Jordan.

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