

Abstract

Separate Foliar Sodium Selenate and Zinc Oxide Application Enhances Se but Not Zn Accumulation in Pea (*Pisum sativum* L.) Seeds [†]

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[†] Presented at the 4th International Electronic Conference on Foods, 15–30 October 2023; Available online: <https://foods2023.sciforum.net/>.

Abstract: Up to 15% and 17% of the world population is selenium (Se) and zinc (Zn) deficient, respectively. Pea (*Pisum sativum* L.) is an important staple legume with a high potential for Se and Zn biofortification in seeds. A 2-year pot experiment investigated two pea varieties (Ambassador and Premium) following foliar-applied sodium selenate (0/50/100 g of Se/ha) and zinc oxide (0/375/750 g of Zn/ha) at the flowering stage. Selenate and zinc oxide had minimal overall effects on growth parameters. Zinc oxide did not improve Zn accumulation in both seed varieties, while selenate improved Se accumulation in both seed varieties dose-dependently. Premium accumulated greater amounts of Se in seeds than Ambassador ($p < 0.001$). Selenium concentrations were highest in seeds of Premium treated with 100 g of Se/ha [7.84 mg/kg dry weight vs. the control (0.16 mg/kg dry weight), $p < 0.001$]. The predominant Se species in Se-enriched seeds was selenomethionine (40–76% of total Se). Consuming as little as 55 g/day of pea biofortified by 50 g of Se/ha would cover 100% of the adult recommended dietary allowance (55 µg) for Se. Findings are important for improving foliar biofortification of pea with Se and Zn.

Keywords: legume biofortification; selenate; zinc oxide; mineral deficiency; nutrition; food security; HPLC-ICP/MS

Citation: Malka, M.; Laing, G.D.; Li, J.; Bohn, T. Separate Foliar Sodium Selenate and Zinc Oxide Application Enhances Se but Not Zn Accumulation in Pea (*Pisum sativum* L.) Seeds. *Proceedings* **2023**, *90*, x. <https://doi.org/10.3390/xxxxx>

Academic Editor(s): Name

Published: date



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Author Contributions:

Funding:

Institutional Review Board Statement:

Informed Consent Statement:

Data Availability Statement:

Conflicts of Interest:

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