Tuber Growth and Quality of Potato (*Solanum tuberosum* L.) as Affected by Foliar or Soil Application of Fulvic and Humic Acids

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Abstract

Humic substances are produced from decomposing plant materials and have various physico-chemical properties that improve soil environments, making them beneficial to the growth and quality of plants. In this study, we examined the effects of fulvic acid and humic acid by foliar or soil application on the yield and quality of potato tubers. Fulvic acid was sprayed onto the leaves of potato plants (cv. Atlantic, Korean name Daeseo) at 50, 60, and 70 days after planting with 1000-X, 750-X or 500-X diluted stock solution. Additionally, humic acid was incorporated into soil at a rate of 40 or 80 g·m−2 with 8 kg of soil-mix before planting potato seeds. There was no significant difference in the number of tubers, total yield, or chemical composition of tubers treated with fulvic acid, but the weight of extra -large tubers increased, which resulted in a substantial increase of the incidence of hollow heart. Soil application of humic acid had no effect on tuber size, total yield, or other chemical compositions of tubers. However, the 80 g·m−2 humic acid treatment resulted in increased mineral contents in the soil and tubers and substantially decreased incidence of hollow heart. Humic acid was believed to be beneficial to increasing P and K contents in both soil and tubers. These findings indicate that fulvic acid and humic acid have no clear promotional effects on tuber growth, but may lead to a high incidence of hollow heart.

Additional key words: humic substances; plant growth; soil bioavailability

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