

Abstract

The Relationship Between Bulb Yield and Allicin Concentration in Garlic Varieties [†]

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Abstract: Garlic (*Allium sativum* L.) is used as a vegetable and medicinal plant. It is a rich source of organosulfur compounds, in particular allicin, which contributes to the flavour and health benefits. Although worldwide garlic production is increasing, demand continues to outstrip supply. Improving the yield of garlic will address the increasing demand, while increasing allicin concentration will improve its potential health benefits and flavour. It is unknown if increasing garlic bulb size (yield) has a negative effect on allicin concentration of garlic. Therefore, a fundamental understanding of the relationship between yield and allicin concentration is required. A field experiment was conducted at Gatton (QLD, Australia) with 32 varieties, of which 29 varieties were sourced from World Vegetable Centre and 3 varieties from existing Queensland sub-tropical varieties. The garlic cloves were planted in March 2018 with 4 replicates in a randomised complete block design and harvested when garlic had 70% senescence. Varieties showed large variation in bulb size, ranging from about 35 to 120 g, with fresh yield ranging from about 5.5 to 16 t/ha. The allicin concentration ranged from 3.5 to 6.6 mg g⁻¹ fresh weight (FW) between varieties and more than 50% of varieties were under the minimum pharmaceutical standard for allicin concentration (>4.5 mg g⁻¹ in FW). Across varieties there was an inverse relationship between yield and allicin concentration. However, there were some varieties which had both high allicin concentration and yield. Current field trials investigate the effect of agronomic practices on yield and allicin concentration in garlic varieties.

Keywords: garlic; varieties; yield; allicin

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