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Formation Mechanism of Grassy Odor Substance in Alfalfa Seedlings

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Sensory test of the grassy odor with 2, 3, 5 and 7-day-old seedlings of alfalfa showed that 2-day-old seedlings are the grassiest. To identify the substance responsible for the grassy odor, the composition of fatty acid and the characteristics of lipoxygenase were investigated. The results showed that more than 50% of total fatty acid is linoleic acid; lipoxygenase has a high specificity to linoleic acid and produces mainly 13-Z, *E*-HPOD from linoleic acid. Because 13-Z, *E*-HPOD is converted to *n*-hexanal which has a grassy odor, the content of *n*-hexanal in the seedlings after germination was measured. It was found that it did not change remarkably throughout the tested growth period. Most of the *n*-hexanal was adsorbed weakly to insoluble materials with hydrophobic interaction. However, when the seedlings were homogenized, soluble *n*-hexanal increased rapidly and the increase was greatest in 2-day-old seedlings. Among three enzymes involved in the formation of *n*-hexanal, only the change in lipoxygenase activity correlated with that in the increase of *n*-hexanal.

Keywords: [alfalfa](#), [n-hexanal](#), [grassy odor](#), [lipoxygenase](#)



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