ACW success stories: 2000

Why carrots become bitter

The carrot is one of the most important products in Swiss vegetable production. To ensure that consumers can enjoy crisp, sweet and tasty carrots, researchers at Agroscope Changins-Wädenswil ACW Research Station have been investigating how every step from cultivation through to sale can be oriented towards good quality.

Carrots can become bitter. ACW experts wanted to find out how and why this happens. They were able to establish that the ingredient isocoumarin causes bitterness in carrots. If isocoumarin is only present in small quantities, the carrot has an insipid flavour, while larger quantities make it bitter. ACW experts determined the ideal isocoumarin content in consumer tests: 10 mg/kg.
They discovered that stress increases the isocoumarin content. Potential stress factors are unfavourable growth conditions, a higher phosphorus content in the soil, fungal diseases, injuries during and post harvest and the effect of the plant hormone ethylene during storage.

ACW experts were able to derive cultivation and storage recommendations from the acquired knowledge – enabling consumers to enjoy tasty carrots.

Carrots must not be stored next to apples
Like all fruit and vegetables, carrots are living organisms, which continue breathing and ripening post harvest. ACW researchers demonstrated that, even in the smallest quantities, carrots breathe ethylene in the air more quickly and form bitter substances. Consequently they must not be stored together with apples, as apples emit ethylene. Four crates of apples can make seventy tons of carrots inedibly bitter within three weeks.