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Cucumbers Recalled Nationwide as Salmonella Outbreak Sickens Dozens—What to Know Join our millions of social followers Follow us for more daily health and wellness tips! FOLLOW US Trending Health Topics Health’s team of medical experts, writers, and editors are committed to ensuring our content is evidence-based, up-to-date, and comprehensive. I hope to use my expertise to help support those who often might feel left out of healthcare to begin their wellness journey. I am passionate about relaying medical information to the public in a way that they can understand, utilize, and feel empowered in doing so. Many of our relationships with food are harmed by misinformation. Having accurate nutrition information helps empower us. I love using my background as a research scientist to write about complex health and science topics in a manner that is accessible to all. The internet abounds with health content, and I aim to bring thoughtful and accessible information on health and wellness to all readers. Knowledge is power. Everyone deserves access to health information that can educate and empower them to make informed decisions about their care. Our Integrity Promise Health’s editorial process follows these key steps to create accurate health content you can trust. Written and edited by health experts and journalists Backed by science-based evidence and research Medically reviewed by board-certified healthcare providers Updated to reflect the latest health and wellness information Learn about our process By Adam Dale, Department of Plant Agriculture, University of GuelphCultivation of raspberries in tunnels and greenhouses is increasing world-wide as it offers the advantages of early production and improved fruit quality. Probably the largest advantage is that many of the fungal diseases are reduced or eliminated, particularly the fruit rots so that the shelf-life of the fruit is significantly expanded. However, to understand how to grow raspberries under tunnels or in greenhouses successfully, the grower needs to understand the biology of the plant, and know something about the systems used in field production of raspberries. Here, in the first of two articles, I will explain the structure of a raspberry plant and discuss various aspects of flower initiation and dormancy as they relate to protected cultivation. In the second article, I will discuss such concepts as cane quality, cane density, within-plant competition, and trellising as they relate to 'long cane' production.Structure and architecture of the plantThe raspberry plant has biennial canes which grow in the first year and produce lateral fruiting shoots in the second year. The first-year cane grows slowly in the spring, rapidly during the summer and slows down in the fall. This gives the typical cane: short internodes at the base and at the tip, with long ones in the middle. In regions with hot summers, growth in summer slows and gives more short internodes in the middle of the cane.New canes are produced from buds at the base of existing canes or from adventitious buds on the roots. As the roots grow out from the plant new root buds develop further away from the original plant. This means that as the plant ages, many new shoots will be produced over a large surface area.In the fruiting year, the lateral branches develop from the tip of the cane downward and often the nodes near the base of the cane do not develop. Typically, the lateral branches near the top of the cane are short, have fewer, small fruits which are spaced evenly along them. In the middle of the cane, the lateral branches are long, have more, larger fruits which are found towards the tip of the branch. The basal lateral branches tend to be intermediate between those at the top and those in the middle of the cane.The presentation of the fruit depends on where the cane is tipped. If a cane is tipped near the top it will have many short lateral branches with few, small fruits and the larger fruit will be near the base of the cane. If the cane is tipped in the middle, it will have few long lateral branches with many large fruits and the large fruit will be presented near the top of the cane.This fruiting structure can be altered if the within-plant competition between the first year and fruiting canes is altered. When the competition from the first year canes is removed, only the lower lateral branches become longer and have extra fruits. Those at the tip are unaffected.Flower bud initiationSummer-bearing raspberries will initiate flowers under various combinations of low temperatures and short days. Research has shown that, on average, flowers will initiate at 10°C in 16 hour days and 12.8°C in 9 hour days. This will vary depending on the fruiting season; early-fruiting varieties will initiate at higher temperatures than late-season varieties. About one week of suitable temperature/day-length combinations are needed to initiate flower buds. The buds at the top of the cane initiate flowers first and then the process moves towards the base of the cane.When flower bud initiation occurs in a particular site will depend on the environmental condition at that location and the varieties grown. Usually this in the fall, but it may not occur until the spring. For example, at my research station in Simcoe, Ontario (42E 45' N) raspberries initiate during September. In 1998,the variety, Tulameen, had initiated flowers by 16 September. In one experiment the same varieties were examined in Invergowrie, Scotland (56E 30' N) and Abbotsford B.C. (49E 0' N) in 1987. At Invergowrie, the variety, Glen Clova, all the buds on the canes were floral by 23 August and in Abbotsford by 27 September. However, in Meeker, all the buds were floral at Invergowrie by 27 September, but in Abbotsford, only the buds at the top of the cane had initiated by 5 October. The lower buds did not become floral until March 1988.DormancyRaspberry canes become dormant under similar conditions to those that cause flower buds to be initiated. Researchers have been more interested in the conditions that allow the plants to break dormancy as different varieties react very differently. Indeed, it is possible to induce the lateral buds on the cane to grow before they become dormant. I have found that five weeks below 7°C is sufficient to break dormancy in Tulameen.Although the varieties react differently it is possible to devise a model to predict when dormancy is complete. With the help of Dr. Derek Jennings, we have been able to devise such a model for raspberries. In this model, Tulameen requires 520 chilling hours for dormancy to be completed and high temperatures can reverse the chilling effect. Once there has been one hour below 8°C, each hour is calculated depending on the minimum temperature as follows: >13°C = -111.1–13°C = -0.58.1–11°C =05.7–8°C =0.5