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Crumbly Fruit in Raspberries

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Each year many inquiries are received regarding the cause of crumbly raspberries. This publication should help the homeowner diagnose the cause of crumbly fruit in the raspberry planting.

Botanically speaking, the raspberry fruit is an aggregate fruit and is called a *drupe*. Each segment consisting of a seed surrounded by flesh is referred to as a *druplet*. A normal raspberry flower has the potential to produce from 100 to 125 drupelets, but usually only 75 to 85 drupelets develop to form the fruit. If appreciably less than this number develop, the berry does not hold together and crumbles as it is pulled from the plant.

Crumbly fruit may be extensive in a planting or it may be almost unnoticed. The extent of crumbly berries usually varies from year to year, but some plants in a planting may consistently produce such fruit.

Causes

Many factors may contribute to crumbly fruit in raspberries. Some of them are described in the following paragraphs.

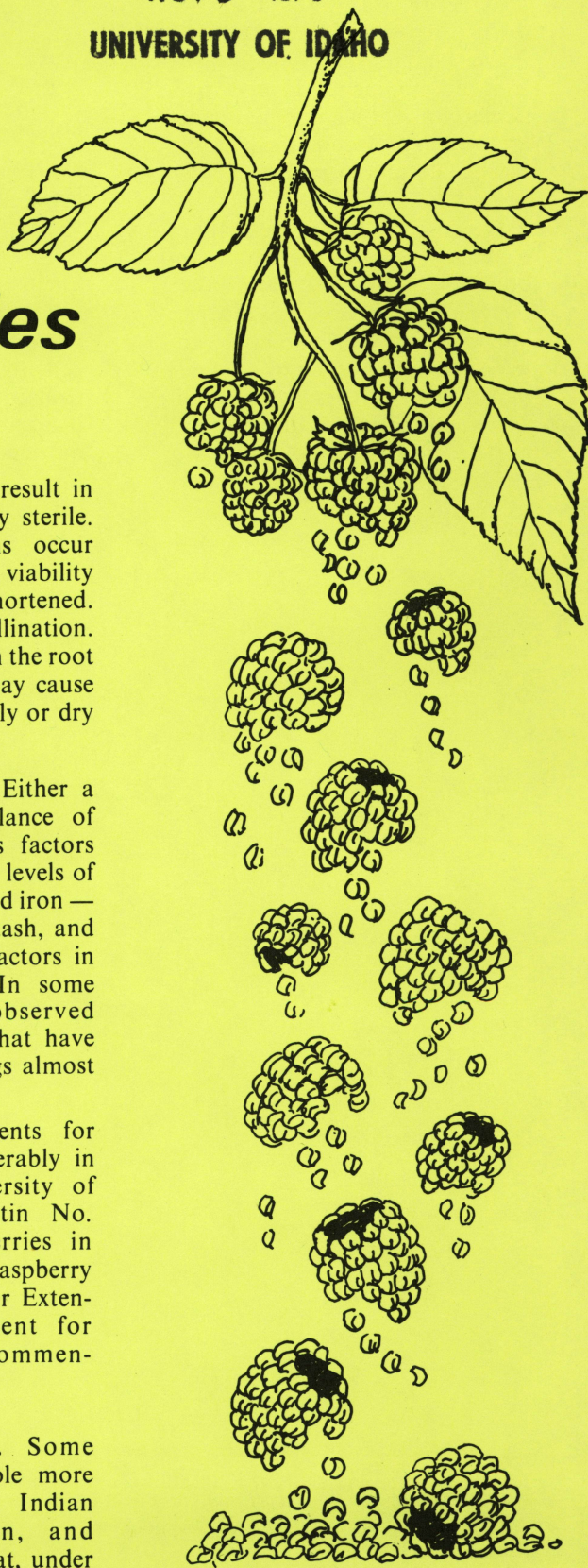
1. **Climatic conditions.** If the weather during the peak of blooming consists of intermittent rain and unseasonably cool temperatures, bee activity will be limited and pollination may be reduced. Extreme drought or excessively dry

soil before bloom may result in flowers that are partially sterile. Should such conditions occur during the bloom period, viability of the pollen may be shortened. This also will reduce pollination. A shortage of moisture in the root zone after pollination may cause the fruit to develop poorly or dry up.

2. **Nutritional deficiencies.** Either a deficiency or an imbalance of nutrients imposes stress factors on the entire plant. Low levels of phosphorus, nitrogen, and iron — and sometimes zinc, potash, and boron — are limiting factors in raspberry production. In some plantings we have observed nutritional deficiencies that have made raspberry plantings almost totally unproductive.

Nutritional requirements for raspberries vary considerably in Idaho. Consult University of Idaho Extension Bulletin No. 419, *Growing Raspberries in Idaho*, as a guide for raspberry production and ask your Extension Agricultural Agent for specific fertility recommendations in your area.

3. **Varietal differences.** Some varieties tend to crumble more than others. Latham, Indian Summer, Washington, and Summer are varieties that, under



certain circumstances, are particularly susceptible. Occasional plants of most varieties apparently mutate to a crumbly condition. You should remove these defective plants.

4. **Pesticide damage.** Certain pesticides may damage the flowers and prevent pollination or fruit development. This is particularly true if volatile herbicides are used in or around the planting during the bloom period.

5. **Diseases.** These problems probably are responsible for more crumbly berries than any other factor, largely because diseases are influenced considerably by environmental factors, soil moisture, and plant nutrition. The combination of diseases and other factors occurring

simultaneously in a planting can result in added adverse effects on the plants and cause extensive crumbling of berries.

Diseases most commonly associated with crumbly fruit in Idaho are root rots, Verticillium wilt, crown gall, cane gall, and viruses.

Root rotting fungi reduce the number of functional roots, which in turn reduces the amounts of nutrients and water taken up by the plants. Verticillium wilt impedes upward movement of water in infected plants.

The bacteria that incite crown gall and cane gall disrupt normal cell division and differentiation. Consequently, cellular function is disrupted as are normal flow of nutrients and water.

Virus diseases are perhaps the most devastating of all the diseases. Virus diseases alone can cause crumbly fruit. When virus diseases are present in combination with other diseases, insects, or any of the other factors listed, the entire planting may produce mostly crumbly fruit. See Idaho Current Information Series No. 337 for more detailed discussion of raspberry diseases and their control.

Prevention and Control of Crumbly Fruit

Obtain disease-free planting stock. Maintain vigorous growth by providing adequate nutrition, water, insect, and disease control. Check the plants while they are in fruit and remove those plants that produce predominately crumbly berries.