Raspberry Nutrient Management

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Work by Darrow as early as 1930 established a positive relationship between cane and plant vigor and yield. Cane size (diameter and length) and leaf weight are excellent measures of the productive capacity of a raspberry plant. Most research suggests that it is the physical nature of a soil (that it is well drained and friable) that most affects raspberry productivity. Cane growth, and hence yield, is most affected by root growth, and root growth is most affected by soil drainage. Additionally, soils rich in organic matter are correlated with good plant vigor and yield.

Raspberries grow well over a relatively wide soil pH range, but general recommendations suggest a pH from 5.5 to 6.5 as acceptable. As soil pH nears 7.0, availability of essential metal such as zinc and iron becomes limiting and leaf chlorosis is common. 6.0 is the generally recommended minimum target.

A proper pre-plant soil preparation regime is an essential first step to managing raspberry cane nutrients and vigor. Selecting that well-drained sandy loam, adjusting pH to appropriate levels, and incorporating cover crops are key parts of the process. Of course, a soil test is essential. Once the planting is established, take the soil for testing from within plant rows rather than aisles. Use the cover cropping process to correct soil nutrient deficiencies before planting.

Nitrogen is the one nutrient that will generally be applied on an annual basis. How much to apply is based on plant growth and yield, but generally up to 30 pounds of actual nitrogen per acre will be applied in the planting year and mature plantings will require up to 50 to 60 pounds per acre to insure adequate cane growth. Fall fruiting raspberries may need up to 75 pounds to maintain vigor. Over application of nitrogen does carry some risk. Excessively vigorous plants will not harden well in fall, increasing the risk of winter injury. In addition, plants will have fewer berries per cane if they are growing too vigorously. There are potential pest management implications as well – plants higher in nitrogen seem to support much higher populations of 2-spotted spider mites.

Nitrogen is applied in early spring – perhaps April into early May in Durham. Later application may lead to increased winter injury risk. For fall fruiting types, this risk of winter injury is not important, but late applications may delay harvest in the fall.

Phosphorous is rarely needed when raspberries are planted into land that has been used for vegetable production assuming soil pH is between 6 and 6.5 and soil organic matter levels are relatively high. Phosphorous applications of up to 50 lb P_2O_5 per acre may be recommended if soil levels are low and/or soil pH is above 7.0. Raspberries will

rarely show a response to annual phosphorous applications. Excessive phosphorous levels may suppress uptake of essential nutrients including zinc.

Potassium (potash) is the other macro nutrient commonly applied to raspberries. There is conflicting data on whether potassium chloride (muriate of potash 0-0-60) poses a risk of root injury from the chloride ion for raspberry. In general, on sandy soils, the use of potassium sulfate (0-0-50) or sulfate of potash magnesia (0-0-22) is recommended. How much potassium to apply should be based on soil test, or better yet, tissue analysis. If levels are low, up to 90 lb K_2O per acre are applied. If levels are high, none would be recommended.

Minor elements that may be limiting in some soils include boron, iron, and zinc. The easiest way to manage these is by maintaining the appropriate soil pH. As the soil pH level rises, availability of these elements is greatly reduced – deficiency is likely if pH is much above 6.6. Applications of boron may be warranted in extreme cases – be sure to apply only based on tissue analysis. Zinc and iron deficiency should always be managed by maintaining the appropriate soil pH.

What should I buy for fertilizers? The use of a blended fertilizer such as 15-15-15 is rarely a good choice since for most plantings, excessive phosphorous will be applied. This is not only wasteful and expensive, it is not sound environmentally. Ammonium nitrate (32.5-0-0) is the most common nitrogen source used although calcium nitrate (15.5-0-0) and nitrate of soda (16-0-0) are widely used as well and offer immediate nitrogen availability for the crop. When K is needed, sulfate of potash (0-0-50) or sufate of potash-magnesia (0-0-22 plus 11 Mg) are both good choices. If phosphorous is needed, triple super phosphate (0-45-0) or bone meal (2-24-0) are both readily available.

Tissue analysis should be an at least every 3rd year addition to your regular soil testing program.