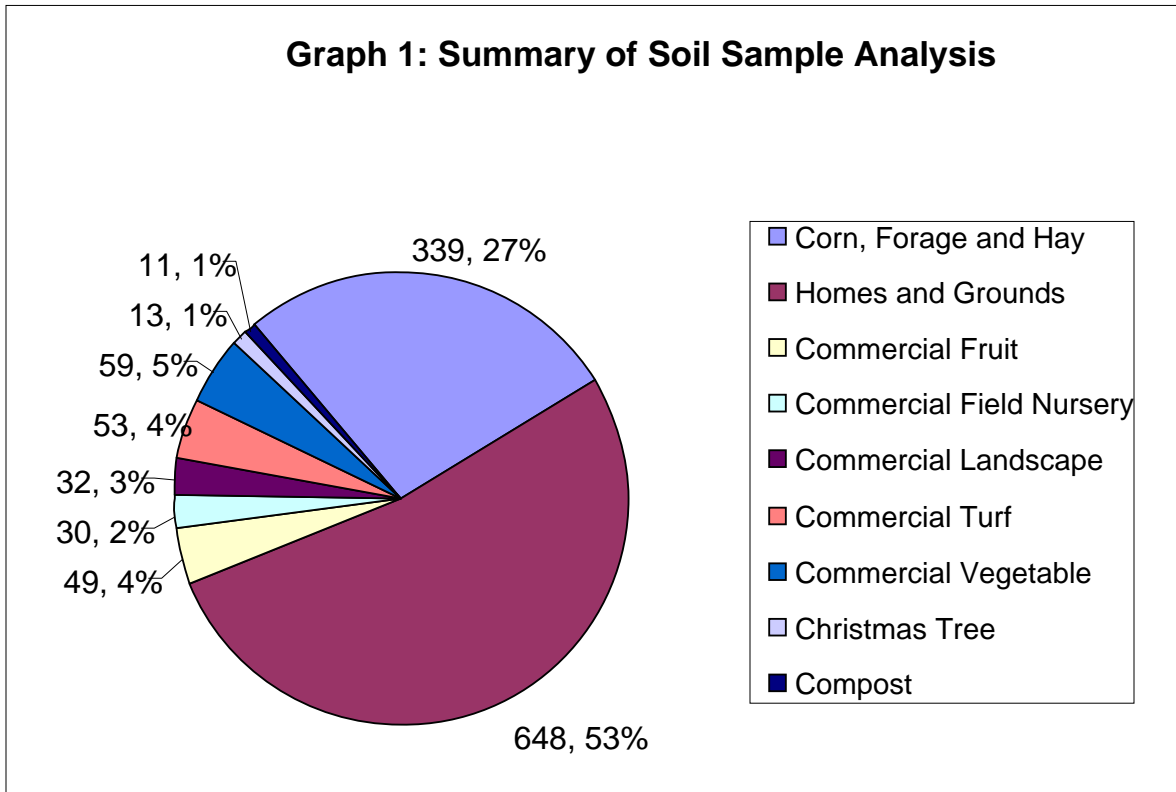


Soil Testing Program Update

Tom Buob, Agricultural Resources Extension Educator, Grafton County

In the 3 months since the start of our new soil testing program, we have processed over 1200 soil samples for New Hampshire residents. The majority of the samples (Graph 1.) were from homeowners who were planting vegetable gardens, landscaping or maintaining a lawn. However, this represents a very small percentage of homeowners that have a lawn or garden. The next largest group was farm samples for corn and forages. Over the years, farmers have become much more aware of the importance of managing nutrients, both from production and environmental perspectives.



(Total number of soil samples: 1,234)

An interesting fact is the range of soil pH in these samples, and although the average was 6.1, the samples ranged from 4.1 to 8.4. Obviously, neither of these levels is desirable for growing crops, which explained why some people were having problems. The soil pH basically controls what nutrients are available to plants and how available they will be. It also determines if certain elements, aluminum for example, are going to be toxic to the plants. Aluminum is abundant in our NH soils, but if the pH is maintained between 6.0 and 6.5, (except for certain acid loving plant) there is usually very little concern about aluminum toxicity to plants. With regular soil testing (every 2-3 years) and a basic fertility program, many garden and lawn problems can be avoided. Without testing, there is no good way to determine why some plants are not doing well or how many nutrients they need.

Another area that I found interesting is our lead screening test which helps to determine if there is any significant amount of lead in the garden, and whether additional testing is recommended. This is included as part of the basic test (\$12) and can provide guidance for minimizing risk. Lead is mostly a concern with young children under six years of age. The average lead soil test value was 24, but the range was from 1 to 1491 parts per million (ppm). The recommended cutoff for soil test lead (in our soil test system) for vegetable crops is 278 ppm, with the cutoff for leafy vegetables being around 100 ppm. In some instances when the lead screening results are medium or high, we recommend an additional test using the EPA procedure for total lead.

If we take a look at the nutrient status of our soil samples so far this year (Table 1.), on average things don't look too bad. But the range on all of the nutrients is quite wide, indicating that some crops don't have enough nutrients and others have far more than they can use. From a crop production standpoint, it is important to have sufficient (optimum) amounts of nutrients and from an environmental perspective, particularly with Phosphorus, it is important not to have too much. Research here in New Hampshire has indicated that phosphorus starts to move around in the environment when soil test levels get above 200. Phosphorus becomes an environmental issue when it moves from a field site to surface water. Since our fresh waters are more sensitive to phosphorus than in other areas of the country, it is even more important to manage this nutrient.

Table 1. Summary of Nutrient Levels

<i>Measurement</i>	<i>Average</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Optimum Range</i>
Soil pH	6.1	8.4	4.1	Depends on Crop
Calcium	1212	16490	50	800 - 1200
Magnesium	128	692	10	80 - 120
Potassium	103	1177	7	150 - 275
Phosphorus	162	1829	12	30 - 50
Lead	24	1491	1	Less than 47

Potassium is one of the nutrients that is typically in short supply in NH soils. Potassium is very important in the growth and health of plants, and is vital in maintaining disease resistance and winter hardiness in plants. Certainly this is the time of year when diseases can devastate plants like tomatoes. One way to help keep plants healthy is to be sure that sufficient potassium is available for plants to use.

Preventing diseases late in the season is often difficult unless you have taken care of them all summer. Many diseases are weather related, so this year has been pretty tough. Having a balanced plant nutrition program provides the background for plant growth and, along with cultural practices (staking, pruning, etc), can go a long way in minimizing the effects of plant disease. It can be very frustrating to watch your plants grow well early in the season only to succumb to disease as the fruit appears!!