Plant Analysis as an Aid in Fertilizing Small Grains

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Production constraints on producers and public concern over the environmental impact of fertilizer use emphasize the need for efficient fertilization programs. Proper fertilizer application ensures efficient plant use and minimum movement into non-target areas. Time and method of fertilizer application can greatly influence plant utilization and fate of fertilizers in the environment. In current agricultural production systems, we must integrate the public concerns over the environment, as affected by agriculture, and the producer's concern for achieving optimum economic return for his fertilizer investment. Soil testing is one diagnostic tool that has been used successfully for many years to improve fertilizer efficiency and economic return in small grains. More recently, plant analysis has been used as another tool to complement soil testing in developing efficient small-grain fertilization programs. Its use, in conjunction with soil testing, can greatly improve fertilizer efficiency and minimize losses into the environment when tempered with observation and experience. Small-grain production and quality are greatly influenced by fertilization. Proper fertility favors high yields of quality grain. The objective of this chapter is to provide the scientific basis for small-grain plant analysis and its use to assess the nutrient status and fertilizer requirements of these crops. The small grains discussed are wheat (*Triticum aestivum* L.), barley (*Hordeum vulgare* L.), oat (*Avena sativa* L.), and rice (*Oryza sativa* L.).