NUTRIENT MANAGEMENT WITH COVER CROPS

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Cover crops can provide many beneficial effects, such as improving microbial activity, organic matter content, soil structure and overall soil quality or tilth. One benefit that may be overlooked is the effect on nutrient availability. Cover crops can be effective in cycling nutrients from the subsoil as well as the surface soil. Depending on type of plant material and amount of crop biomass produced cover crops can accumulate large amounts of the major essential nutrients that are then returned to the soil in a bioavailable form. Cover crops planted in the late summer or fall, after economic crop harvest, are effective in taking up residual nitrogen, preventing it from being lost from the soil. Oilseed radish is particularly effective in accumulating residual nitrogen. However, recent studies indicate that much of the nitrogen sequestered in the oilseed plant tissue may be released too quickly in the spring to be of benefit for the following crop. Cover crops can also have benefit for phosphorus and potassium cycling.

The ranges of nutrient concentrations in the dry biomass of various cover crops are: 3.6-4.5% N, 0.55-0.60% P, and 4.0-4.5% K. Studies with various mustards, oilseed radish and sorghum-sudangrass indicate they can accumulate: 200 - 300 lbs N; 25 - 35 lbs P; 285 - 370 lbs K; 80 - 200 lbs Ca; 14 - 32 lbs Mg; and 17 - 47 lbs S per acre. The large amount of potassium cycled has the most effect in improving the available level in the soil. Available soil phosphorus is much less affected. In two field studies the effect on available P was minimal, but available potassium was increased by 40 and 22 ppm (80 and 44 lbs/acre). Although much smaller amounts of Mg and S are cycled by cover crops, the effect in maintaining their availability can be important. Therefore, cover crops can play an important role in maintaining and improving the availability of nutrients in the soil.