

Fertilizer is important to the agricultural industry and to meeting the nutritional demands of a growing population. The composition of chemical and organic matters in fertilizers can vary significantly requiring analysis to maintain consistency and quality. Color technology plays an important part in the analysis of both mineral and organic fertilizer blends. Spectrophotometric determination of the many elements necessary for functionality, safety, and quality in fertilizers can be quantified according to both physical and chemical properties. The data this method offers is a valuable resource for the agricultural industry and aids in the overall effort towards a [more sustainable farming market](#).

Quality and safety regulations

Like many other manufactured goods, fertilizers are regulated by government agencies for both quality and composition. [The Association of American Plant Food Control Officials \(AAPFCO\)](#) monitors the regulatory policies in the US, Canada, and Puerto Rico to ensure that products are labeled correctly and conform to safety and quality standards. Color technology plays a vital role in this process. Elements such as [phosphorus and nitrogen must be analyzed](#) and quantified to meet standard definition regulations. Spectral technology can quantify these properties accurately and consistently and is a preferred method of evaluation for both agricultural and chemical manufacturing.

Color technology uses rapid and repeatable evaluation methods to differentiate between numerous elements in chemical and organic fertilizer products. Repeatability allows for consistent monitoring of total nutrient content allowing real-time adjustments during processing that lead to higher product yields. Color technology can be used with minimal sample preparation, and the durability and portability of this instrumentation make it an ideal form of evaluation in the chemical and agricultural industries.

Spectrophotometric determination of urea

Unlike mineral fertilizers, organic fertilizers vary in composition and can be difficult to regulate. The primary attributes of fertilizers depend on chemical and physical properties to maintain balance and quality. Identification of specific attributes can ensure that these products perform as intended and are applied correctly. Organic fertilizers contain chemical elements such as manure or a mixture of nitrates to [improve the quality of the soil](#). The correct balance of these properties is important for improving crop yields and developing tolerance to pests and weeds.

In addition to phosphorus and nitrogen, urea is another important element that affects the performance of fertilizer products. Color technology offers a [rapid method to determine low concentration urea in fertilizer products](#). Although urea is a beneficial element in plant growth and stability, excess levels can damage plant growth and production. Urea levels in fertilizer are normally very low, but urea contamination can occur during processing causing an imbalance in ammonium nitrate fertilizers. Since this imbalance adversely affects the quality of these products, it is important to monitor these levels continuously throughout the processing phases. Color technology can easily quantify urea levels based on simple chemical reactions and color changes. Including urea analysis in product development is essential to create dependable, high-quality fertilizer products.

Color technology and spectrophotometric instrumentation

Spectrophotometers offer advanced color technology for a variety of applications in the chemical and agricultural industries. These tools can perform a variety of analytical methods of evaluation and be adapted to perform numerous applications. The agricultural industry depends on color technology to improve soil and fertilizer quality and increase sustainability in many areas of food production.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-chemical-industry/color-technology-and-sustainability-assessing-chemical-and-organic-fertilizers/>