Fluid Fertilizers

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Fluid fertilizers are available in a wide range of products to Kentucky farmers. Although the term "liquid fertilizer" is commonly used to describe all fluid fertilizers, in reality the two terms do not imply the exact same meaning. Technically, all fertilizers of fluid consistency which can be transferred by pump are called "fluid fertilizers". This is the proper term to use in the broadest sense to describe such materials. There are two general types of fluid fertilizers. One group is called "suspensions" or "slurries", and the other group is referred to as "clear liquids".

Suspension Fertilizers
This class of fluid fertilizers contains very finely-divided undissolved solid components (mostly plant food) which are kept from settling to the bottom of storage tanks or applicator tanks by use of a suspending (gelling-type) clay and mechanical agitation of the fluid mixture. The major advantage of such a mixture is that mixed grades of higher plant food content are possible than with clear liquid mixtures. In some instances, suspension mixtures contain as much or more plant food than some dry fertilizers. With use of proper application equipment, these high-analysis suspensions provide the advantage of fluid handling and uniformity of spreading.

Clear Liquids
This class of fluid fertilizers is the most common type of fluid in Kentucky and differs from the suspensions in that no undissolved solids are present and no suspending agent (clay) is used. Clear liquid mixtures have a much lower viscosity than suspensions, and once they have been mixed, require no further agitation to keep plant food content uniform throughout the storage or application tank. Generally, since all solid materials are dissolved in clear liquid mixtures, plant food content is lower than that of suspension mixtures. A few clear liquid producers use non-conventional fertilizer materials in order to produce clear liquid mixtures of higher analysis, which, although agronomically acceptable, usually add greatly to the cost of production.
Although clear liquid mixtures containing either N or N and P₂O₅ or N, P₂O₅, and K₂O are available in Kentucky, by far the most commonly used clear liquid fertilizer is nitrogen solution. Nitrogen content of solutions sold in Kentucky is generally 28 percent, half the N being in the form of ammonium nitrate and half as urea. Nitrogen solutions are used in many different ways, but generally as a supplemental source of N for production of corn, small grains, tobacco, and grass hay or pasture fields.

Value of Plant Food Content of Fluid Fertilizers

Fluid mixed fertilizers, particularly clear liquids, contain plant food in a soluble form. Because of this, some clear liquid producers maintain that their products are agronomically more effective than dry mixed fertilizers. Much research has been conducted showing that this is not the case. As compared with dry mixed fertilizers currently being produced in the U.S.A., liquid fertilizers have been shown to be no better or no worse than dry fertilizer on a pound-for-pound basis of the plant food (N, P₂O₅, or K₂O) being evaluated. Soil and fertilizer experts consider liquids to be just as effective as dry fertilizers.

Calculating Plant Food Content of Fluid Fertilizers

In order to determine the plant food content of some volume of fluid fertilizer, the weight of that volume must first be determined. Generally speaking, fluid-fertilizers weight 10-12 pounds per gallon, depending on the particular product. Once gallons are converted to pounds, plant food content is calculated just as with dry fertilizers since the guaranteed fertilizer analysis is on a percent-by-weight basis. As an example, the N content of 28 percent N-solution would be determined as follows: Since each gallon weighs 10.67 lbs, there is .28 x 10.67, or 2.99 lbs. actual N per gallon of solution. Suppose 100 lbs. actual N per acre was needed. It would take 100+ 2.99, or 33.4 gallons of 28 percent N-solution to provide 100 lbs actual N. As another example, plant food content of a liquid 9-18-9 analysis would be determined as follows: Since a gallon of 9-18-9 would weigh about 12 pounds, there is .09 x 12, or 1.08 pounds each of N and K₂O in each gallon, and .18 x 12, or 2.16 pounds P₂O₅.

Claims have allegedly been made by some clear liquid sales people during the past few years in Kentucky that "one gallon of a clear liquid mixture contains as much plant food as 100 pounds of dry mixed fertilizer of the same grade." Use of the simple arithmetic as explained above will show this to be physically impossible. Fortunately, most fluids are sold in the state by local businessmen on a sound agronomic basis, emphasizing the advantages which fluids have, largely from the standpoint of uniformity of application, ease of handling, and capability for mixing other chemicals with the fertilizer.