

P AND K PLANT NUTRIENT REPORTING CHANGES TO ELEMENTAL BASIS

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FUTURE PUBLICATIONS and other communications of the University of California will report amounts or percentages of a plant nutrient (whether in the plant, in the soil or in a fertilizer) in terms of the chemical element itself. This policy, aimed at simplification and the use of less confusing terminology, follows a similar official change by the American Society of Agronomy and a growing trend in publications of other states as well as within the fertilizer industry.

In the past, fertilizer terminology has been confusing, because the elemental terms have been used for nitrogen and the oxide terms for phosphorus and potassium. Nitrogen (N) and most other plant nutrients have customarily been described according to the actual amount of the element present. But phosphorus (P) is traditionally listed according to the amount of phosphorus pentoxide (P_2O_5), even though P_2O_5 contains only 44% phosphorus. Potassium (K) is commonly described in terms of potassium oxide (K_2O) which contains only 83% potassium.

One of the problems resulting from this inconsistency appears in mixed fertilizer formulas. The fertilizer now called 6-24-24, for example, contains 6% nitrogen; 24% P_2O_5 (about 10% phosphorus); and 24% K_2O (but only 20% potassium).

OXIDE TO ELEMENT FERTILIZER CONVERSION METHODS

Oxide-element and element-oxide conversion formulas for potassium and phosphorus are shown below:

OXIDE TO ELEMENT CONVERSION TABLE

Per cent or Pounds	Multiply by factor	Converted to per cent or pounds
Conversion to element		
P_2O_5	× 0.44	= P
K_2O	× 0.83	= K
Conversion to oxide		
P	× 2.29	= P_2O_5
K	× 1.20	= K_2O

These conversions also can be read directly from the "Fertilizer Conversion Scales" included on this page.

Thus the correct ratio of nutrient elements is 6-10-20. Another problem with this vague and inconsistent terminology is that it encourages misnaming of ingredients. For example, P_2O_5 , which actually is phosphorus pentoxide, is commonly called phosphoric acid, available phosphoric acid, phosphate, or even "phosphorus." Several of these terms, as well as the elemental terms, have sometimes been used synonymously in a single publication or article.

The new policy of elemental reporting will mean a significant change from the traditional terminology for phosphorus and potassium. For example, treble superphosphate, 0-46-0, will become 0-20-0; and 100 lbs of P_2O_5 ("available phosphoric acid") per acre will be stated as 44 lbs of phosphorus per acre. This change will also make fertilizer terminology consistent with that now used in soil, plant, feed and insecticide analysis.

Under this policy, University publications, visual aids, test plot designations and similar communications will describe plant nutrients in terms of the element involved—but *the traditional oxide terms will follow in parentheses when appropriate*. Also, researchers are asked to decide amounts of plant nutrients to be used in test plots and other experiments on an elemental basis, using whole numbers, and to give the oxide equivalent in parentheses. (Conversion formulas, tables and graphs are included with this policy statement.)

University research, educational and extension facilities will be used to acquaint farmers with the meaning of the new terminology. Particular emphasis will be given to the fact that this is a change in description only; *the nutrient content of any fertilizer remains the same*. The decision for a more complete change-over in terminology in the fertilizer industry—including dual labeling—would have to be made by the industry and governmental agencies. (Although legislative changes would be needed in some states, dual labeling is now possible under California law.)

FERTILIZER CONVERSION SCALES

Element to Oxide
(Pounds or Per Cent)

PHOSPHORUS P	PHOSPHORUS PENTOXIDE P_2O_5	POTASSIUM K	POTASSIUM OXIDE K_2O
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