HOW TO EVALUATE A FERTILIZER BID

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ONE OF THE MAJOR problems encountered by individuals in the turf industry, has been how to properly and fairly evaluate the comparative costs of various types of fertilizers. This is further complicated in that various manufacturers produce such a variety of different analyses and types.

First, let's be realistic and admit that it would be virtually impossible to compare and evaluate all types. Also, in most cases, the superintendent is not interested in a wide range of types. His mind is pretty well made up in advance as to just what he wants. He should have basic parameters established on what would constitute an acceptable fertilizer. Specifications should be listed that are restrictive enough to give him what he wants, and yet broad enough to provide several manufacturers the opportunity to submit competitive bids.

An example this could include some of the following:

1. A homogeneous granular or pellet.
2. NPK ratio within 15% of 3-1-2.
3. Not less than 30% of organic nitrogen and activity index.
4. List of desirable trace elements.
5. Range of screen or sieve sizes.

Of course many more could be added to this list, or changed to fit the individual's needs.

Once this has been completed, we are ready to begin our evaluation of comparable products.

In the example listed above, we used a 3-1-2 ratio of NPK as our desired analysis. Therefore, the fertilizer contains six total units of NPK. Of this, nitrogen constitutes ½ of the total units, so it should amount to about ½ of the bid price. The cost per pound of actual nitrogen can then be computed, based on the percent of N in the formulation and ½ of the bid price.

In general, we can assume that nitrogen costs three times as much as potash and phosphate costs twice as much as potash. This then, gives us the following formulas for computing the relative cost of our three major ingredients:

$$\text{cost/lb. of actual N} = \frac{\text{½-Ton bid price}}{(2{,}000)\ (\%\text{ of N})}$$

$$\text{cost/lb. of actual } K_2O = \frac{\text{cost/lb. of N}}{3}$$

$$\text{cost/lb. of actual } P_2O_5 = (2)\ (\text{cost/lb. of } K_2O)$$

Now that we have these basic costs, we can expand them into a more realistic cost of the total fertilizer, based upon the percent of content of each of them.

A = % of N in formulation
B = % of P in formulation
C = % of K in formulation
N = Cost/lb. of actual N
P = Cost/lb. of actual P_2O_5
K = Cost/lb. of actual K_2O

Using the above figures, we can now reach a relative cost value for 100 pounds of fertilizer with the following formula:

$$(A)\ (N) + (B)\ (P) + (C)\ (K) = \text{Formulation value/100 lbs.}$$

The cost can now be calculated, based on the above figure, to put one pound of actual N plus all other ingredients on 1,000 sq. ft. of turf area.

This final figure is the one used for comparison of values, and should never be treated as an absolute. It is a relative figure, as are the figures it will be compared against.

Let's use a hypothetical case and see if the formula works!

The following three bids are received:

1. 15-5-10 @ $100.00 per ton.
2. 18-6-12 @ $120.00 per ton.
3. 13-4-9 @ $105.00 per ton.

First bid: $100.00/ton for 15-5-10.

$$\text{Cost/lb. N} = \frac{50.00}{(2{,}000)\ (.15)} = .17¢\text{/lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.17}{3} = .06¢\text{/lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.06) + .12¢\text{/lb.}$$

THEREFORE:

$$(A)\ (N) + (B)\ (P) + (C)\ (K) = \text{Formulation value/100 lbs.}$$

$$(.17)\ (15\%) + (.12)\ (5\%) + (.06)\ (10\%) = \$3.75\text{/100 lbs. or } 3.8¢\text{/lb.}$$

Fertilizer that contains 15% nitrogen will require 6⅔ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 3.8¢ times 6/66 lbs. or 25.3¢ per 1,000 sq. ft. of turf area.

Second bid: $120.00/ton for 18-6-12.

$$\text{Cost/lb. N} = \frac{60.00}{(2{,}000)\ (.18)} = .17¢\text{/lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.17}{3} = .06¢\text{/lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.06) = .12¢\text{/lb.}$$

(Continued on page 20)

PRINCIPLES OF TURFGRASS CULTURE by John H. Madison, Department of Environmental Horticulture, University of California, Davis. 405 pages plus index; 107 illustrations; 6 x 9; Van Nostrand Reinhold; $19.95. Publication date: March, 1971.

Principles of Turfgrass Culture is a compendium of the vast amount of literature available in the field. After noting the material, the author extracts general principles, then uses them to illustrate their bearing on various management problems and practices. Emphasis is placed on the interactions between different management practices and different environments; the principles are used to show the directions in which one can go and the compromises that are necessary to achieve certain goals.

The author provides complete coverage of the anatomy, morphology, genetics, taxonomy, and physiology of the turfgrasses—physiology and ecology are treated throughout the book as parts of almost every chapter. The author then explains climate, soils, plant nutrition, irrigation, salinity, and drainage.

An unusual feature of Principles of Turfgrass Culture is the inclusion of sections called practicum, or practical review, which make it possible to review quickly important practical applications of the scientific principles and data to field management. A second feature is the nexological approach that considers management practices as an interrelated network of the whole in which each affects the results of all the others — irrigation, mowing, disease control, fertilization, and so forth, are never considered as isolated bits in a program.

The ten chapters of Principles of Turfgrass Culture are as follows: Anatomy and Morphology of the Turfgrass Plant; Taxonomy, Cytology, and Genetics; Turfgrass Physiology; Turfgrass Climate and Microclimate; Soils; A Brief Introduction to Soil Chemistry and Plant Nutrition; Plant Nutrition and Fertilizers; Soil, Plant, and Water Factors in Irrigation; Irrigation Design; Drainage and Salinity. This important reference also contains a Glossary, Author Index, and Subject Index.

THEREFORE:

(.17) (18%) + (.12) (6%) + (.06) (.12% = $4.50/100 lbs. or 4.5¢/lb.

Fertilizer that contains 18% nitrogen will require 5½ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 4.5¢ times 5.5 lbs. or 24.75¢ per 1,000 sq. ft. of turf area.

Third bid: $105.00/ton for 13-4-9.

$$\text{Cost/lb. N} = \frac{52.50}{(2{,}000)\ (.13)} = .20¢/\text{lb.}$$

$$\text{Cost/lb. } K_2O = \frac{.20}{3} = .07¢/\text{lb.}$$

$$\text{Cost/lb. } P_2O_5 = (2)\ (.07) = .14¢/\text{lb.}$$

THEREFORE:

(.20) (13%) + (.14) (4%) + (.07) (9%) = $3.79/100 lbs. or 3.8¢/lb.

Fertilizer that contains 13% nitrogen will require 7⅔ lbs. of fertilizer per 1,000 sq. ft. to apply 1 lb. actual N/1,000 sq. ft.

Thus, actual cost becomes 3.8¢ times 7.66 lbs. or 29.1¢ per 1,000 sq. ft. of turf area.

Now—let's summarize these three bids.

1. 15-5-10 @ $100/ton = 25.3¢/1000 cost.
2. 18-6-12 @ $120/ton = 24.75¢/1000 cost.
3. 13-4-9 @ $105/ton = 29.1¢/1000 cost.

It becomes evident that the cheapest bid to start with was not necessarily the most economical as an end product. These figures are relative, and should be used for comparative purposes only. This method is much more accurate, and in many cases, will reflect a different cost than that shown by comparing the cost of N alone. This in turn gives the most important reasons for using this method of evaluation. It eliminates controversy and disagreement on the part of those bidding, and allows positive justification to superiors for final selection of a successful product.