Careers in Chemistry: Farming

Farming is big business in the United States with profits for the lucky and possible bankruptcy for the less fortunate. *Farmers should not be ignorant of chemistry*. For instance, to be profitable, a farmer must know when to plant, harvest, and sell his/her crops to maximize profit. In order to get the greatest yield farmers often add *fertilizers* to the soil to replenish vital nutrients removed by the previous season's crop.

Corn is one product that removes a tremendous amount of phosphorous from the soil. For this reason, farmers will rotate crops and/or add fertilizer to the ground before planting crops for the following year. On average, an acre of corn will remove 6 kilograms of phosphorous from the ground.

Assume you inherit a farm and must now have to purchase fertilizer for the farm. The farm is 340 acres and had corn planted the previous year. You must add fertilizer to the soil before you plant this years' crop. You go to the local fertilizer store and find **SuperPhosphate**™ brand fertilizer. You read the fertilizer bag and can recognize from your high school chemistry class a molecular formula $Ca_3P_2H_{14}S_2O_{21}$ (you don't understand anything else written on the bag because it is imported fertilizer from Japan). You must decide how much fertilizer to buy for application to your corn fields. If each bag costs $54.73; how many bags of fertilizer must you purchase and how much will it cost you to add the necessary fertilizer to your fields?

Given: 1 bag of fertilizer weighs 10,000 g   [454 g = 1 pound]