# Careers in Chemistry: Farming

How much fertilizer will you need?

Conversion Factor: 1 acre corn = 6 kg phosphorous

x g P = 340 ~~acres~~ x (6 kg P) x (1000 g P) = 2.04 x 106 g P

(1 ~~acre~~) (1 kg P)

If a bag of fertilizer has the formula Ca3P2H14S2O21,

The molar mass of it is 596 g/mol.

## 3 Ca @ 40g/mol = 120 g

**2 P @ 31 g/mol = 62 g** % P = Part 62 g

## 14 H @ 1 g/mol = 14 g Whole 596 g

## 2 S @ 32 g/mol = 64 g

21 O @ 16 g/mol = 335 g 10.4 % Phosphorous

Ca3P2H14S2O21 = 596 g

In a bag of fertilizer you have 10.4 % (by mass) phosphorous.

A bag of fertilizer weighs 10,000 g (about 22 pounds).

10.4 % of 10,000 g = 1040 g phosphorous / bag of fertilizer

2.04 x 106 g P = 1962 bags of fertilizer

1040 g/bag

### Total Cost (1962 bags of fertilizer)($54.73 / bag) = $107,380