Layout of the National Agronomy CDE Team Activity

The team will be provided a scenario of an agronomic situation and will be asked to develop a management plan in one hour. The team will be required to develop both an oral presentation and a written plan that addresses the question in the scenario. The team will submit a written plan.

All team members are expected to participate in the activity.

Cost information may be utilized for various practices such as irrigation, machinery, harvesting, seedbed preparation, storage and loan interest rates, as well as fertilizers and chemicals. The students may be asked to figure profit or loss based on this information.

Source: http://www.ffa.org/documents/cde_agronomy.pdf

Rational for the layout of the SC Agronomy Team Activity

A management plan similar to one that teams may be asked to create to satisfy a proposed scenario at the national contest is already given. Teams will be asked to calculate various parameters of the given management strategy. The first goal is to give students an idea of the calculations that are required to determine the amounts of materials needed to perform the necessary operations. If you can determine all of your inputs (seed, fertilizer, machinery, fuel, labor, pesticides, anticipated yield, etc.), you should be able to determine your projected profit margin. The second goal is to have the students divide the work amongst them. This is recommended as the problem is too great for one student to complete in the given time.

SC FFA Agronomy CDE Team Activity 2010 Example Problem

You set out to plant herbicide tolerant corn in a 500 acre field of your farm. No tillage will be preformed in this operation. You plan to broadcast fertilizer at the time of planting based on a soils test and apply nitrogen fertilizer at two later growth stages of your crop. Herbicide will be applied once before your crop emerges, once during the growing season, and once shortly before harvest. You have a drawn 24 row no-till drill with a 76 foot swath and a self-propelled sprayer with booms that expand to cover a 100 foot swath and contain a total of 76 nozzles. All field operations are preformed at 4 miles per hour. The seed you've selected has an 85% field germination rate. The results of a soil test indicate that you need to apply 100 lbs Nitrogen (N) per acre, 15 lbs Phosphorus (P) per acre, and 35 lbs Potassium (K) per acre at the time of planting.

1. Your planter is set so that there are 10 inches between each seed in a row. Calculate how many pounds of seed you need to sow the entire field. There are 1,200 corn seeds per pound.

$$\frac{500\,acres}{field} * \frac{43{,}560\ ft^2}{1\,acre} * \frac{planter}{76\ ft} * \frac{24\,rows}{planter} * \frac{seed}{10\,in} * \frac{12\,in}{1\ ft} * \frac{1\,lb\,seeds}{1{,}200\,seeds} = \frac{6{,}878\,lbs\,seed}{field}$$

2. Determine the seed spacing your planter would have to be set at to achieve a population density of 15,000 plants per acre.

$$\frac{15{,}000\ plants\ desired}{X\ seeds\ sowed} = \frac{85\%\ field\ gern}{100\%} \qquad X = 17{,}647\ seeds$$

$$\frac{1\,acre}{17{,}647\ seeds} * \frac{43{,}560\ ft^2}{1 acre} * \frac{24\,rows}{planter} * \frac{planter}{76\ ft} * \frac{12\,in}{1\ ft} = 9.35\,in$$

3. You decide to use 35-0-0, 0-45-0, and 0-0-60 to fulfill the recommendations made by the soil test and meet the field's initial nutrient requirements. Calculate how many pounds of each you need for the field.

$$\frac{100\,lbs\ N}{1\ acre} * \frac{100\,lbs\ \ fertilizer}{35\,lbs\ N} * \frac{1\,lb\ N}{1\,lb\ N} * \frac{500\,acres}{field} = \frac{142{,}857.1\,bs\ N}{field}$$

$$\frac{15\,lbs\ P}{1\,acre} * \frac{100\,lbs\ \ fertilizer}{45\,lbs\ P_2O_5} * \frac{1\,lb\ P_2O_5}{0.44\,lbs\ P} * \frac{500\,acres}{field} = \frac{37{,}878.8\,lbs\ P_2O_5}{field}$$

$$\frac{35\,lbs\ K}{1\,acre} * \frac{100\,lbs\ \ fertilizer}{60\,lbs\ K_2O} * \frac{1\,lb\ K_2O}{0.83\,lb\ K} * \frac{500\,acres}{field} = \frac{24{,}208.3\,lbs\ K_2O}{field}$$

4. Calculate the theoretical time it will take to spray herbicide once on this field in hours. This calculation assumes no time is taken to turn, refuel, or refill the tank.

$$\frac{500\,acres}{field} * \frac{43{,}560\ ft^2}{1\,acre} * \frac{sprayer}{100\ ft} * \frac{1\,mile}{5{,}280\ ft} * \frac{1\,hour}{4\,miles} = 10.3\,hours$$

5. For your pre-harvest herbicide application, you set each nozzle of your sprayer to apply 0.2 gallons per minute so that your mixture applies 20 ounces of herbicide per acre. Calculate the gallons of water that you'll need to complete this.

$$\frac{1\,hour}{4\,miles} * \frac{1\,mile}{5{,}280\ ft} * \frac{60\,\min}{1\,hour} * \frac{43{,}560\ ft^2}{1\,acre} * \frac{sprayer}{100\ ft} * \frac{0.2\,gallons}{\min * nozzle} * \frac{76\,nozzles}{sprayer} * \frac{500\,acres}{field} = \frac{9{,}405\,gallons}{field}$$