

For Event Purposes Only—2019 FFA Agronomy Team Event

2019 Team Problem Scenario:

For all operation expenses, use the provided list of operations and costs.

Situation: Your four person consulting team of your FFA Chapter has been hired by a local farm in Northeast Indiana to advise them on their crop management decisions for one field. The farm has been offered a contract with a premium for raising a high oleic soybean (Plenish) cultivar. Your team will help the farm determine **if the Plenish soybean is more profitable than a non-Plenish soybean in the chosen field**. Total field size is 29.57 acres and consists of three distinct management zones. Please refer to the accompanying soils map of the field, fertility map, and yield table.

Zone 1 is an Eel silt loam soil (Es) of **10.36 acres**. The Eel silt loam is well-drained, has a higher than typical soil organic matter content, and is high in fertility. The farmer has harvested 80+ bushels of soybeans per acre and 260+ bushels per acre of corn on this site. See **section on Yield** for the yield of the planned soybean crop this year.

Zone 2 is a Lenawee silty clay loam soil (Ls) and is **4.09 acres** in size. The zone is poorly drained and often floods. Soybean yield can range from zero to a medium level often due to flooding. See **section on Yield** for the yield of the planned soybean crop this year.

Zone 3 is a Shoals silty clay loam (SgnA) with 0-1 percent slopes. It is frequently flooded since the western field boundary is a man-made drainage ditch (15 feet wide and 7 feet deep) that often floods since this field is less than 2 miles from a major river. When the river floods water backs up into this ditch and takes out the Lenawee zone. This zone is **15.12 acres** in size. See **section on Yield** for the yield of the planned soybean crop this year.

Scenario:

Wayne Trace Farms has hired your team of consultants to advise on whether they should accept a contract opportunity that they've been offered. The opportunity under consideration involves a contract to grow Plenish soybeans, a high oleic soybean with an oleic content of over 72% and linolenic acid content of less than or equal to 3.0% as measured by Gas Chromatography (GC). Plenish soybeans must be kept separate from other soybeans and other crops to ensure identity preservation. To accomplish identity preservation without having to store the beans in a clean, separate grain bin, the grower plans to truck the harvest the dedicated field with a cleaned combine and truck the beans immediately to a terminal that accepts Plenish beans using a clean truck.

The contract specifies the following:

- Plenish soybeans must be grown using Best Management Practices for Identity Preserved Plenish Soybeans as listed in the contract. **(This involves making sure the combine, trucks, etc, are cleaned of any contaminating crops and other details the grower will take care of).**
- Moisture at delivery cannot exceed 13.5%.
- Plenish high oleic soybeans must meet the receiving terminal's quality specifications for commodity soybeans at the time of delivery (proper test weight, moisture content, meet USDA grade specifications, and be suitable for storage). **For the purpose of this exercise assume that the soybeans will meet the receiving terminal's commodity specifications.**

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- Premium Scale Offered: Upon delivery the Plenish beans will be tested by NIR machine and GC to determine oleic and linolenic acid content and the Plenish soybeans must have >72% oleic content and <3.0 linolenic acid (**Again, assume that the Plenish soybeans do meet this requirement when delivered**). If met, the terminal will pay a \$0.40 premium for harvest delivery of the soybeans. You are to assume that the soybean price at delivery is \$8.98/bushel so with the premium, Wayne Trace Farms will receive \$9.38/bushel for their Plenish soybeans.
- The nearest terminal that can accept Plenish soybeans is Bunge in Decatur, IN and is 14.1 miles from the field. Trucking the soybeans to the terminal will cost \$0.005 per bushel per mile (**Yes, that equates to one-half cent per bushel per mile**).
- **For your calculations and comparison, the nearest terminal for non-Plenish soybeans is 9.1 miles from the field and the cost per bushel per mile will be the same as for the Plenish soybeans.**

Wayne Trace Farms would like your team to evaluate the economics of the contract to determine if the profit or loss potential justify taking the contract. If you determine that the farm should reject the contract, you will determine which non-Plenish soybean cultivar available to them should be planted. In the process of this determination, you are to calculate the breakeven point for each type of soybean and determine how much profit or loss will result from each of the two possible types of soybeans they might grow. In addition, the farm would like your advise on a preemergence herbicide to include with their burndown program and an economic analysis of the value of including a R3 pesticide application.

Please at each step in your calculations use only two decimal places in your answer.

Field Characteristics:

Size: See Zones 1, 2, and 3 above for acres in each zone. The field totals 29.57 acres.

Tillage: The farmer will plant using no-till equipment so soybeans will be no-tilled with a split row planter with 15" row spacing. A burndown herbicide application will be required!

Weeds: Winter annuals that must be controlled include yellow rocket, henbit, dandelion, purple dead nettle, and **most importantly glyphosate resistant marestail or horseweed. Marestail especially in no-till systems is a very big issue and requires a pre-emergence herbicide to be applied with the burndown products. You will be given the burndown regime but you must choose the pre-emergence product or products that must be included when the field is sprayed.**

The field also has problems with water hemp, foxtails, common ragweed, cocklebur, barnyardgrass and **late-season fall panicum.**

The burndown combination that you will use is: Buccaneer Plus at 32 fl. oz. per acre plus Weedone 2,4-D LV4 at 11 fl. oz. per acre plus Dicamba HD at 8 fl. oz. per acre. This plus your choice of preemgence herbicides will be sprayed at 15 gallons spray per acre. You must also include spray grade ammonium sulfate at 8.5 pounds per 100 gallons of spray solution. Be sure to state on the answer sheet any precautions or restrictions that use of these products might cause.

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Your choices for preemergence herbicides either alone or in combination are as follows:

- 8 oz. per acre of Trivence
- 1.3 pints per acre Me-Too-Lachlor
- 4.5 oz. per acre Fierce XLT

Disease/Insect Issues: Frogeye leaf spot is a major issue in this field with the occasional phytophthora problem. There are often soybean aphids and Mexican bean beetles that can become serious. You will need to do a COST/BENEFIT analysis to determine if a R3 (**Beginning pod** - pods are 3/16 inch (5 mm) at one of the four uppermost nodes) herbicide/fungicide/insecticide application is economical to apply.

Use a yield increase of 7 bushels per acre as the expected yield boost using the correct product or products. The application will be applied in 20 gallons of spray solution per acre so remember to add spray grade ammonium sulfate at 8.5 pounds per 100 gallons of spray water if you include glyphosate or generic roundup in the R3 pesticide application.

Cultivar Selection: See the accompanying table for choices of Plenish and non-Plenish soybean varieties. All cultivars listed are Roundup Resistant soybeans. Assume that when seed of a particular cultivar is purchased, the lot sold to the farm has in seeds/pound the average of the range listed for that cultivar. **All soybean cultivars will be sold to the farm at \$65.00 per bag and each bag of seed will contain 140,000 seeds.**

Seeding Rate: Seeding rate will vary by Zone. Zone 1 will be seeded at 140,000 seed/acre; Zone 2 will be seeded at 180,000 seed/acre; and Zone 3 will be seeded at 160,000 seed/acre. Again, each bag of seed contains 140,000 seed per bag.

Soil Fertility: See the accompanying A&L Great Lakes Laboratories soil test report with results for each zone and a composite for all zones together. Using Tables 1, 2, and 3 from the Tri-State Fertility Recommendation Guide included in your packet, you will need to determine whether it will be more economical to apply variable rates of fertilizer across the field and how much and what type of fertilizer to apply. **Round yields up or down** to nearest ten bu/ac of yield (ex. 78.1=80; 33.5=30).

Yield Results: Use the following yields by zone for whichever cultivar you choose to plant.

<u>Zone:</u>	<u>Plenish Cultivar Yield bushels/acre</u>	<u>Non-Plenish Cultivar Yield bushels/acre</u>
1	78.1	82.2
2	33.5	35.3
3	46.1	48.5
Composite Avg.	55.5686	58.4812

For Your Calculations: Again, use two decimal places for each step of your calculations so your numbers (if correct) will match the answer key.

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Available Fertilizers, Analysis, and Prices per Ton

<u>Grade</u>	<u>Fertilizer Name</u>	<u>Price</u>
10-20-20	Mixed blended fertilizer	\$340/ton
28-0-0	Liquid Urea Ammonium Nitrate Solution	\$328/ton
	Density is 10.67 lb/gallon or 2.99 lb N/gallon UAN	
28-0-0-5S	Thiosulfate, liquid, 11.1 lb/gallon	\$280/ton
45-0-0	Urea, prilled	\$345/ton
11-52-0	MAP (diammonium phosphate)	\$536/ton
0-0-60	Muriate of Potash	\$381/ton
0-0-0	Calcitic Limestone	\$46/ton applied
0-0-0	Dolomitic Limestone	\$46/ton applied

Cost for Field Operations

Soybean Planting—No-Till	\$19.25/acre
Fertilizer Application—Dry	\$ 7.25/acre
Fertilizer Application—Liquid	\$ 8.50/acre
Lime (including Lime)/Application	\$46.00/acre
Spraying Pesticide Ground	\$ 6.50/acre
Combining Soybeans	\$31.50/acre
Hauling grain	0.005/bu/mile

Pesticides Available and Costs

Approach Prima	\$202.24/gallon	\$1.58/fl. oz.
Lambda Select	\$ 83.20/gallon	\$0.65/fl. oz.
Trivence	\$ 34.40/pound	\$2.15/oz.
Fierce XLT	\$ 68.96/pound	\$4.31/oz.
Buccaneer Plus	\$ 11.51/gallon	\$0.09/fl. oz.
Dicamba HD	\$ 46.08/gallon	\$0.36/fl. oz.
Weedone 2,4-D LV6	\$ 19.20/gallon	\$0.15/fl. oz.
Me-Too-Lachlor	\$ 29.04/gallon	\$3.63/pint
Spray Grade Ammonium Sulfate	\$ 12.75/51# bag	\$0.25/lb