**FARMER**

I own 330 acres of land and raise corn and soybeans. I rotate my crops every year planting half in corn and half in soybeans. They next year I rotate the acres. I sell my grain to local elevators and the corn and soybeans get turned into many different food and industrial products. In 2006 I started to see a decreased yield in my soybean fields because of insects. I asked a **crop scout** to come and help me identify the problem.

**CROP SCOUT**

I send most of the summer months outside working on my tan (farmer’s tan that is). I drive around the countryside and then walk corn and soybean fields to help farmers identify problems. Sometimes I use drones to monitor big fields. Other times I just walk them. I swing nets to capture flying insects. I inspect individual plants to find other insect, fungus, or other disease damage. I then work with an **agronomist** to help recommend a course of treatment to keep the plants healthy.

**AGRONOMIST**

I help identify the best course of treatment to keep plants healthy and growing well. If the field is affected by a fungus I might recommend a fungicide. If the field is affected by weeds I might recommend a herbicide. But if the field is affected by insects I will recommend an insecticide to treat them. I work with an **entomologist specializing in invasive species** to identify what insect is affecting the crop.

**INVASIVE SPECIES ENTEMOLOGIST**

I work with insects that have been introduced to the United States from other countries. The soybean aphid was introduced from China. I study how the insects have spread and try to figure out management strategies. Sometimes management strategies include **integrated pest management** and so I work with my other **entomologist** colleagues.

**INTEGRATED PEST MANAGEMENT ENTEMOLOGIST**

I help identify natural predators to invasive species. Integrate pest management means that we use many different approaches to combat pests like insects. We try strategies like prevention, crop rotation, and tillage. Some pests like aphids have natural predators (ladybugs) that will help control them. But sometimes the ladybugs can’t keep up and so we have to spray insecticides. I work with a **chemical applicator** to determine the best insecticide.

**CHEMICAL APPLICATOR**

I help farmers spray their fields with fertilizer, herbicides, and insecticides when needed. I am always safe around chemicals and wear proper protective clothing. I want the chemical to be applied directly to the plant so that it doesn’t drift away and cause problems in other fields. I use special nozzles that have been developed by an **engineer** to help direct the flow of the chemical spray.

**ENGINEER**

I design spray nozzles and other component parts that might be fitted onto a tractor or implement used in farming. I’ve been working on a sprayer lately that will change the size of the water droplets, the width of the spray, the direction of the spray, and the rate of the spray. All of these modifications will help apply just the right amount of chemical to a field when needed. But the chemical mix is all controlled by a computer, so I need to work with a **computer programmer**.

**COMPUTER PROGRAMMER**

I write code for computers in modern tractors and implements. My programs tell the machines how much water to mix with each chemical and will regulate the mixes. I can also program the computer and tractor to only spray the chemical on the field where it is needed. This prevents using too much chemical and wasting money spraying where it isn’t needed. To stay safe, I use proper mixing rates that are set by **regulators**.

**REGULATOR**

I work for the Environmental Protection Agency and help determine the safe levels of pesticide application. I look at all of the scientific research and help decide the correct dosage that can be applied to fields. I work closely with **chemists** at crop science companies to set these regulations.

**CHEMIST**

I work for a crop chemical company and study the chemistry of insecticides. There are a lot of ingredients in every single pesticide we put out on market. I want to ensure they are effective at killing insects, but safe for plants, animals, and humans. Once we determine the correct dosage we make sure it is clearly labeled on the container and work with a **graphic artist**.

**GRAPHIC ARTIST**

I design the labels that might be on a container of insecticide. It is important to communicate the brand, so I might design a specific logo for each insecticide. But it is also important to make sure people are aware of proper usage procedures and any potential risks. I include all of those in the label design. Farmers need to learn about how to properly use the chemicals and so sometimes I’ll work with a **videographer** to help communicate those messages.

**VIDEOGRAPHER**

I create TV advertisements, how-to videos, and other video segments to help explain the insecticides to farmers and consumers. I help explain why it is important to manage soybean aphids and how the insecticide will help do that. Sometimes I interview **botanists** to get a better understanding of how it all works.

**BOTANIST**

I study plants and how they grow. This includes understanding how fertilizers make them healthier and how insects and diseases might weaken them causing lower yield. For example, aphids will not only pierce the soybean plant and suck out fluids that it needs, but by doing so they create a wound in the soybean plant can be susceptible to diseases getting into the plant. I work with **plant breeders** to help make plants like soybeans hardier.

**PLANT BREEDER**

Some plants are naturally resistant or more tolerant to diseases and insects. But those plants don’t always produce the best fruit or seeds. I work to find naturally resistant variety of plants and cross them with plants that have a high yield to create hybrid vigor. But sometimes natural crosses don’t always work. I work with **geneticists** to determine if any of these traits are ideal for biotechnology research.

**GENETICIST**

I look at the genetic makeup of plants to try and make them better. I’m looking at genes that may make soybeans resistant to aphids. The gene might make the plant smell bad to the aphid. Or it may produce a toxin that would kill the aphid if the aphid tried to eat the soybean plant. But my research is only just beginning. It will be at least 5-7 years before we see results. Then it might another 10-15 years before the crop is ready for farmers. We want to make sure it is safe and there aren’t any unintended consequences. I work with **college professors** and other researchers to conduct these field safety trials.

**COLLEGE PROFESSOR**

Part of my job involves research and I am currently testing different varieties of soybeans to see how they grow in this climate. Once we identify a variety that is ideal for this climate and soil type I will share my findings with **seed processors**.

**SEED PROCESSOR**

I contract with farmers to grow seeds that other farmers will then plant for their crops. I make sure the seed is sorted, cleaned, treated, weighed, and is high quality for planting. I ensure that it is certified weed free and ready for next year’s growing season. I work with the local cooperative manager and seed salesman to ensure they have what they need.

**COOPERATIVE MANGER / SEED SALESMAN**

I help get farmers the type of seed they need to plant each year. I help them decide what seeds are best for their soil, their climate, and their farm. To by seeds, fertilizer, and chemicals, sometimes farmers need loans. I can also connect them with bank **lenders** to secure loans.

**AGRICULTURAL LENDER**

I work at a local bank, but I specialize in helping farmers get the capital (money) they need for their operation. I might grant them a loan to buy inputs (like seed, fertilizer, or chemicals) or even things like machinery or more land. I work with them to ensure they pay back their loan over time. I work with the farmer and their **accountant** to help ensure that the business is stable and will continue to grow.

**ACCOUNTANT**

I am the accountant and bookkeeper, but I’m also a family member! Farms are often incorporated which is a type business structure to help manage risk. But our incorporated business is still just run by family members. I ensure the books are accurate and up-to-date. When I’m not managing the financial side of the business, I’m in the field helping with the **farmer** planting, harvest, and other chores.