Soya bean Culture / Management Guidelines

For

Travares Manes Association

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Soya Bean Production Guide

Planning:

Planning is a strategic part of any operation. “Without a vision the people perish” is a quote that has application here. 4 –6 months prior to any field work, one needs to begin the planning process. How many hectares (acres) will be planted to what crop. What is the crop rotation? What are the seed supplies? Keeping in mind the spring planting work schedule and fall harvest schedule with the other crops being grown. Costs of inputs? One has to consider the marketing plan at this time as well. What do you plan to do with the crop? Storage space? Marketing? Price? These are all questions that enter the planning process.

Source Seed Supply:

Obtaining seeds can be a significant “bottleneck” in growing soya beans, especially in Africa, where seed is frequently exchanged across country borders. The supply country may want to make sure all their own country’s folks have their supply first. In one event that I am familiar with the seed arrived across border two months late.

Care must be taken when handling soya bean seed. Due to the nature of the soya bean, the cotyledons can be damaged and thus kill germination. This is especially true when the seeds are very dry. A drop of less than a meter on a hard surface can separate the cotyledons. Mishandling of bags of seed can reduce germination. Germination of 80% to 85% is normal for seed. Germination of less than 70% should be adjusted for with planting rates. Since Angola doesn’t have seed laws as in some other countries, germination can be an issue to consider. One can check germination by taking a sample of 100 seeds, wrap in a moist towel and keep moist for 5-7 days and then unwrap and count the number of germinated seeds.

The planting method may have an impact on varieties chosen. No – till farming in some areas have growers seeking a stronger emergence varieties. Other plant characteristics such as pod height and disease resistance are traits that are selected for. With the advent of specialty beans coming on market, one needs to consider other traits such as Round up Ready, etc. Once the decision was made on variety, one needs to find a source of the seed. Check with seed supplier early in order to obtain the variety that you want. Determine the price of the seed. Whether early payment is a good

option for you, depends on the price and the availability of cash. Normally, one can get a better price when the terms are cash. Also, check on delivery date of seed. Make sure you know when the planned delivery date is. Also, it may be advantageous to establish a "drop dead" deadline, after which the product will not be accepted.

Seedbed Preparation:

In areas where soil testing is possible, do it! Not that all tests are 100% accurate but it does gives a qualitative value. This is an area in Sub Sahara Africa that would add value for the agricultural industry as a whole.

Prepare a weed free seed bed. Weeds take sunlight (The prime source of energy for any plant) plus moisture and nutrients that should be saved for the targeted crop. The seed bed should be relatively firm so the seeds get placed to the same depth for uniform emergence.

Planting dates:

Planting dates will vary with locations. The best is to check with local Extension Agents for they should have the latest information. In the Longonjo, Angola, Africa planting should be December 20 to January 10. That should catch the rains and still mature by the beginning of the dry season. Soya beans take about 120 days of good growing conditions to mature (compared to dry beans that will mature in 90 days). Then they require some time to die prior to harvest. That planting date would put them near harvest by June of the following year. Later plantings would require planting closer together (in order to canopy the soil and capture all the sunlight they can) as well as increasing planting rate. Later plantings will reduce the plant size and thus the number of sites where beans can form. Soya beans normally produce almost twice as many flowers as they can set seed on.

Inoculants:

The use of inoculants in Africa is a relatively new idea. Soya bean plants live in a symbiotic (mutual beneficial relationship with each other) relationship with soil bacteria that live off the energy of the soya bean plant and in return these bacteria can take nitrogen out of the air and provide the plant with most of its nitrogen requirements. Other soya bean growing areas have applying specific inoculants on the soya bean seed for years. In Africa, due to the hot, humid climate of the growing area, the bacteria don't survive

very long. Recently, there has been work with different inoculants for the region. (IITA organization is a good source of information for this project). In addition, there is work being done on genotypes that don't require (or maybe they are more "friendly" to local bacteria) additional inoculants. The issue of inoculants is an area to stay "on top" for the future.

Planting rate:

Planting rare will depend on many factors. The goal is to get the soil canopied (covered) over as early as possible so the plants can intercept as much sun as possible for as long a time as possible. A soya bean plant will spread out to almost 1 meter across. Plant the seeds about 1inch deep in a firm seed bed, so the plants emerge uniformly. Planting in rows will allow for cultivation with machines or oxen. Hand cultivation will allow for closer plantings. The goal is to have approximately 140,000 plants per hectare. Late planting will require increasing seeding rates (a rule would be to increase planning rate by 1% by every day planting after ideal planting date. In the Longonjo area might be January 10). Soya bean varieties have some individual characteristics of their own. Some varieties require a little larger populations in order to maximize their yield potential. Ask your seed supplier for recommended seeding rates of the varieties that you purchase.

Soil types, moisture and fertility may also affect seeding rates. Good soils can take higher populations and produce higher yields and on poorer soils, the seed rate should be reduced Higher populations in poor soils will significantly reduce yields over lower populations. Populations can vary from 100.000 to 140,000 plants per hectare.

Emergence:

The ideal planting situation would be to plant the soya bean and then have a nice 'soft' rain along with warm growing conditions. With ideal conditions, the beans should emerge in 4-6 days. The quicker one gets the plants out of the ground the better. The soya bean has two early "leaves" called cotyledons. They emerge the soil in a 'hook' form. If the soil is hard or crusted, (most times a result of a hard rain.) the cotyledons have a difficult time emerging. Under severe crusted conditions, the soya bean may not emerge at all but break off under the soil surface. Under soil crusting conditions, if there is a way of breaking up that crust mechanically or manually, it would improve the plant stands. Hard rains are some of the primary causes of soil crusting. Soil types have a role to play as well, some soils crust more easily than others.

Weed control:

Weed control is an important management practice of soya bean production. A weed is ANY plant that is growing where it is not wanted. Weeds do several things that limit crop production. Weeds intercept the sunlight that the soya beans need. That is one of the most significant issues of weed management. Remember, your goal is to get the plants to intercept as much sunlight as possible. Every weed will take "some" of the sun's energy away from your crop. The next and almost as important is that the weeds take up nutrients and moisture that the target plants require. Then is some areas, (especially where mechanical harvest is done) certain weeds may affect harvesting. (in the US we have Polk Weed that has a purple berry that can stain the soya bean grain at harvest and thus reduce its market value).

Insect control:

A periodical check of the fields to watch for insects is a management issue that is often overlooked. Certain insect populations can climb very rapidly (aphids are an example) and then they can drop just as rapidly. monitoring the field is part of the integral management responsibilities. Check with local Extension Agents or other knowledgeable folks (other farmers who have experience in growing soya beans) as to what insects are worth protecting against and which ones are harmless. The key for insects is monitoring your fields. Frequent walks thru the field will tell a "story". Be aware of insects that remove leaf area. Also some insects will "suck" the sap out of the plant.

Maturity:

As the plant matures, the energy in the leaves will move to the bean. The last couple weeks of growth will add significant weight to the bean. Let all the leaves drop naturally as they move the energy from the leaf to the bean. When the beans are immature, they have a coating around the seed. Upon maturity, the beans become free of any of that coating. After maturity, the bean only needs to loose moisture. A good test is to bite the grain. It should be hard and not doughy.

Harvest:

Harvest fairly soon after the beans are mature. The longer they are left in the field, the more field loss will occur. In the event of rainfall, the pods swell and then upon drying they tend to shatter (shattering means the pods open up and the beans fall on the ground). Soya bean varieties vary in the tendency for shattering. All soya beans will eventually shatter if exposed to a number of swelling and drying. Harvest is suggested as soon as reasonable upon maturity.

Threshing and Storage:

In North America, we thresh at harvest time. In Africa, the situation is different. The beans are pulled and stacked on piles. Later they are threshed. Keep in mind, when growing soya bean for seed, the form of threshing that I am aware of (beating the dry plants with a stick) could affect the germination of next year's seed. One might be wise to use a gentler form of threshing or thresh by hand for seed production. Pulling seed out of regularly harvest soya beans may result in lower germination seed. Check that before planting. Store the grain where insects and rodents will not be an issue of concern.

Growing soya bean in sub-Sahara Africa has become a good cash crop for the farmer. Soya beans have so many uses. Working together, additional markets can be found for soya bean and that can give the farmer most cash to improve additional areas of their operations, such as fertilizer and lime. Soya beans work great in rotation with maize and other crops.