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New Plant Construction

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Duane W. Tyler 1/

For the purpose of getting to the main subject of this address, I shall not go into any basic needs for a new processing plant. Nor will we discuss the economic values to be considered prior to formulating plans to build such a plant. It is appropriate to say, however, that a great deal of thought should be given to the most desirable location of any industrial type plant.

We have often been asked, "What will a new seed plant cost?" The answer is a fielder's choice. True, there are many standards to seed plant requirements. Rarely, however, is there an accepted standard plant. The design of a seed, grain, corn, bean, or specialized plant depends strictly on what the owner wants the plant to be able to do.

As a guide to formulating plans for a new plant, I have found the following check list of questions of great help. These are in three categories.

TYPE PLANT

1. Commodities to be processed.
2. Size seed lots and total quantity of each.
3. Types or varieties.
4. Expected foreign material or other crop seeds to be removed.
5. Approximate percentages of contaminants or foreign materials.
6. Type of treating or inoculating, if required.

OPERATION

1. Length of production season.
2. Working hours per day.
3. Days operation per week.
4. Size working force.

FACILITIES

1. Receiving methods and quantity of each in bulk or bag.
2. Storage facilities - existing or required for incoming seed.
3. Needed type, size and number of in-process bins, including bulk holding of clean seed.
4. Number and size of bins ahead of bagging.
5. Speed of bagging operation or bags per minute.
6. Method of movement of finished seed from the bagging operation.

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Some of the questions may be difficult to answer at first, but nevertheless, they should be considered carefully.

Once the type and scope of the plant is established; the size and type of equipment needed can be determined and listed. At this point, consideration needs to be given to possible ways to expand, if needs later call for it. Also, because of constant changes in crops, allowance should be made for auxiliary or reclaiming type cleaning machines.

At least allow some space in the new plant for possible changes in the process.

It is common knowledge that too often the physical space in many plants is the limitation to needed changes or expansion. It is not wise to waste space, thus a plant should be efficiently planned from the out-set.

The next phase in planning for your new facility is to make a rough flow diagram of all equipment, bins, and general facilities within the operation. I shall later refer to types of plant flows and how complete and helpful these can be.

Any initial flow diagram need not be complicated in order to be extremely useful. This is certainly an inexpensive yet positive way to visualize each stop or phase of a system.

After the flow is finalized, the next phase of planning is to estimate costs.

Quite accurate estimates of plant size, shape, number of floors, number of elevators, and even cost estimate can be made from a complete flow diagram.

If, at this point, costs figure to be greater than anticipated, you must try to pin down what you can afford to cut out.

Weigh carefully, costs of any equipment or feature eliminated.

Some will think if smaller cleaning machines are used, say 50% smaller, that this will appreciably reduce overall costs. This is far from true. As an example, a seed corn plant I designed for a large company was figured for 140 bu./hr. At the outset, we knew that in two years production would likely be increased to 300 bu./hr. Therefore, we anticipated what equipment costs would be involved. The costs were less than \$10,000.

The point is - the original plans were adapted for orderly expansion. These changes were made two years later, precisely as planned.

There are various formulas used to estimate plant costs. Such examples might be:

Concrete in place	\$50 to \$55 per yd.
Concrete for large pits	and deep footings
Steel buildings, erection.	7¢ to 8¢ per lb.
Steel tanks - approximately.	6¢ to 8¢ per lb.
Machinery installation.	25% to 35% of equipment costs
Steel bins or hoppers (11 ga. metal)	
with hand slide gate	55¢ per lb. to build
Dust suction systems with cyclone collector	\$1.00 per c.f.m. installed

These estimates, of course, are general and will vary depending upon working conditions, weather, space around new structure and area labor costs.

Using such estimates of installation expense can give a reasonably close overall cost estimate to which you should add some safety factors. If such an estimate is initially made, then a tentative decision or commitment of financing can be made prior to further expenses of finalized plans.

Equipment currently available for seed plants offer improved labor saving benefits and flexibility to an operation.

But - a word of caution here ---- very few theories of seed processing have not been tried by someone, somewhere, at some time. The best protection against building a "White Elephant" is to consult with people or firms who can give you firm and accurate answers.