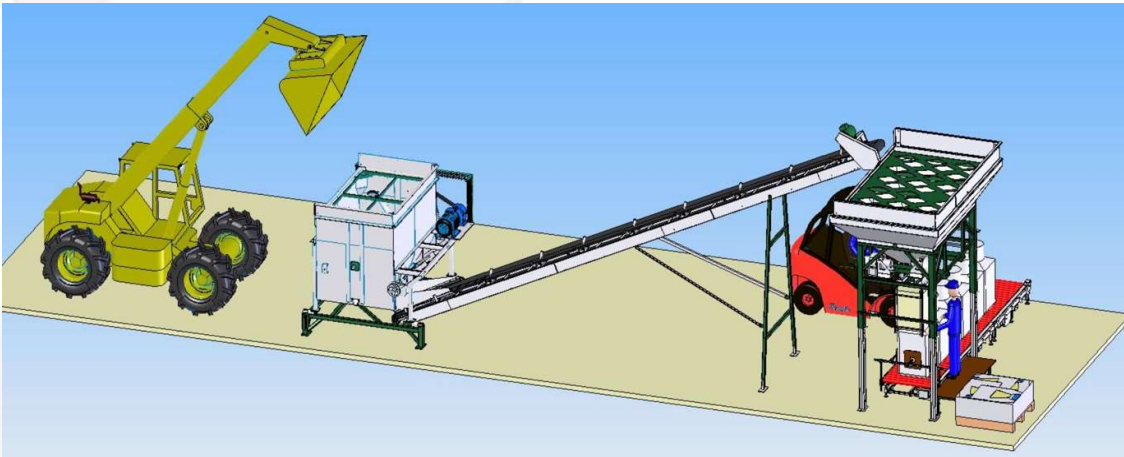


Part 2: Setting Up a Blending Operation

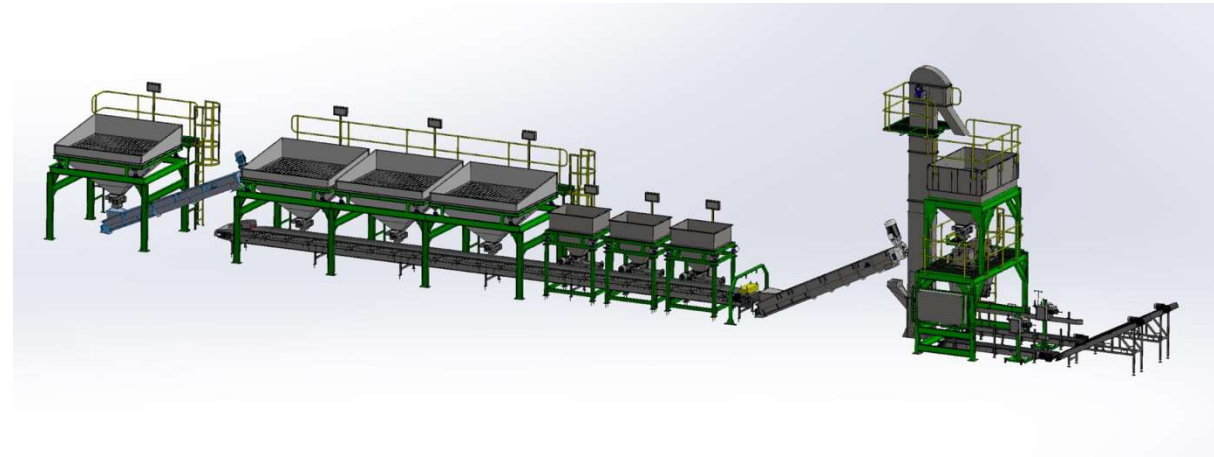
2.3 Selecting the type of bulk blending plant

Categories of bulk blending plants

1. Batch type plant

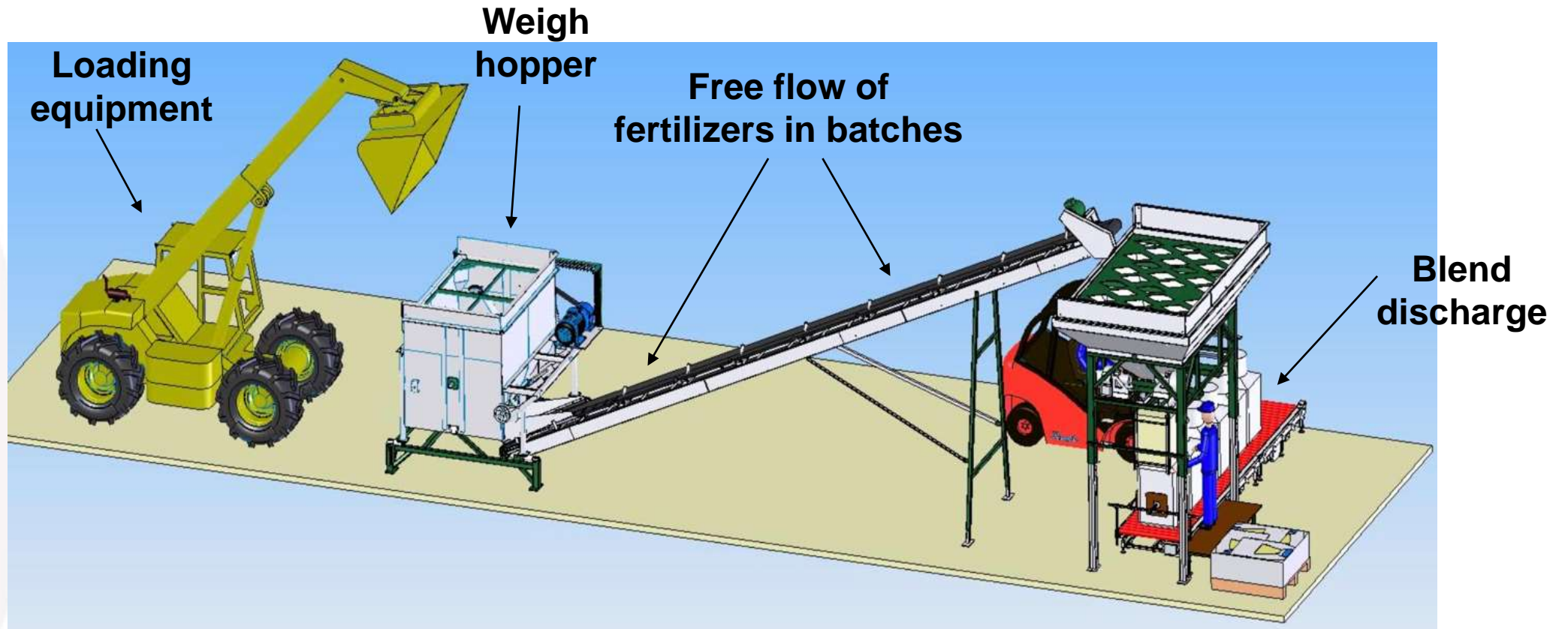


2. Continuous type plant



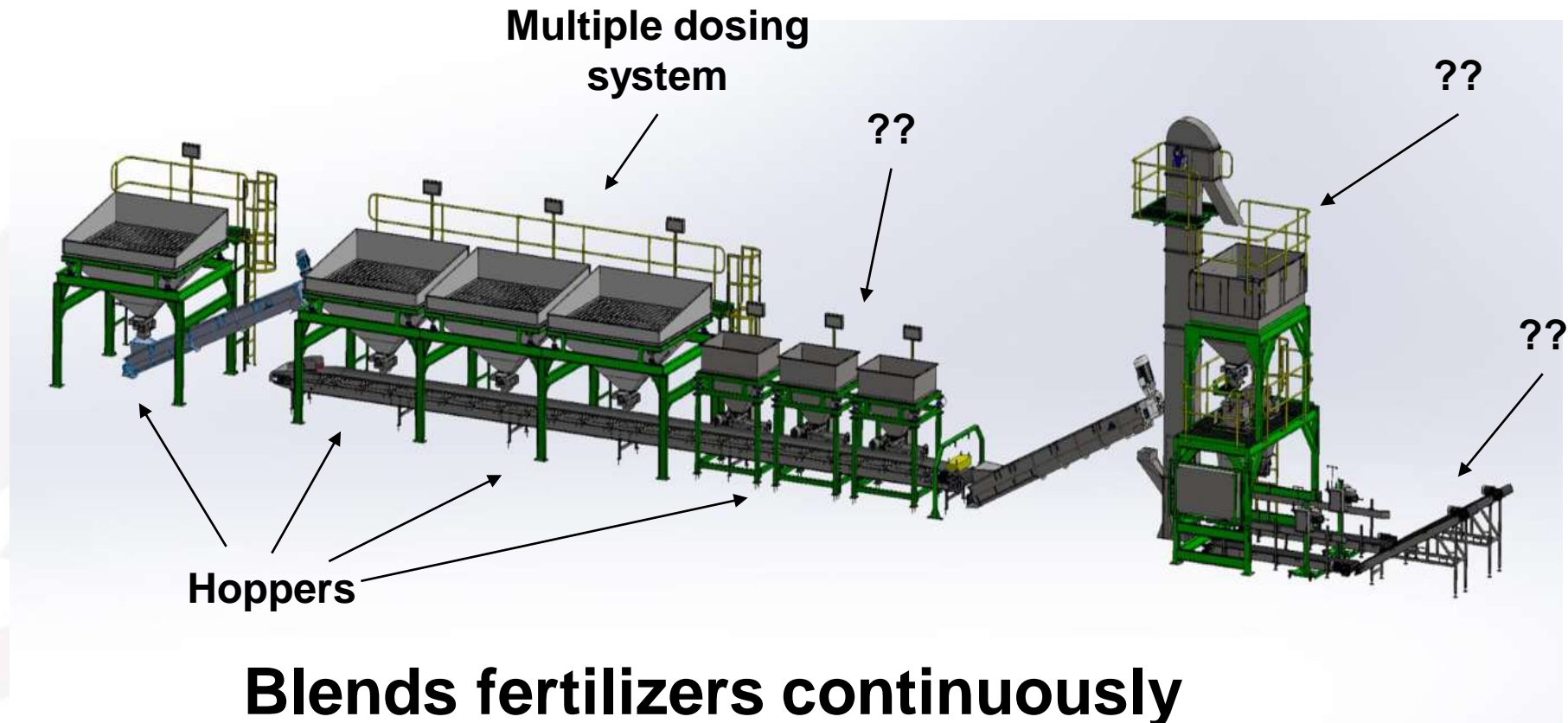
3. Combination of batch and continuous type plants

Batch type blending plant



Needs to be refilled for every new batch

Continuous type blending plant



Blends fertilizers continuously

Differences batch and continuous type

Batch type	Continuous type
Produces blends of different recipes (one recipe per batch)	Produces blends of the same recipe
Produces in batches ranging from 1-14 tons	Produces in large volumes at a time
Produces at a speed of not more than 70 tons per hour	Produces at a speed of more than 70 tons per hour

Other differences

Batch type	Continuous type
Can be operated manually or with low-level software	Always an automated system and uses a higher level of software to control material flow
Blend cycle time can be easily adjusted	Blend cycle times cannot be easily adjusted
Easily handles special blend formulas and very complex blends	Success relies heavily on constantly feeding raw materials to meet the required production rate

Other differences

Batch type	Continuous type
Easily handles powder and liquid micronutrients.	Success relies heavily on free-flowing raw materials
Easier setup for small capacities, therefore good for near or on-farm setup	Easier setup for large capacities
Only tower-type systems can handle very high tonnages	Can handle very high tonnages due to the possibility of multiple intake bins and bagging lines

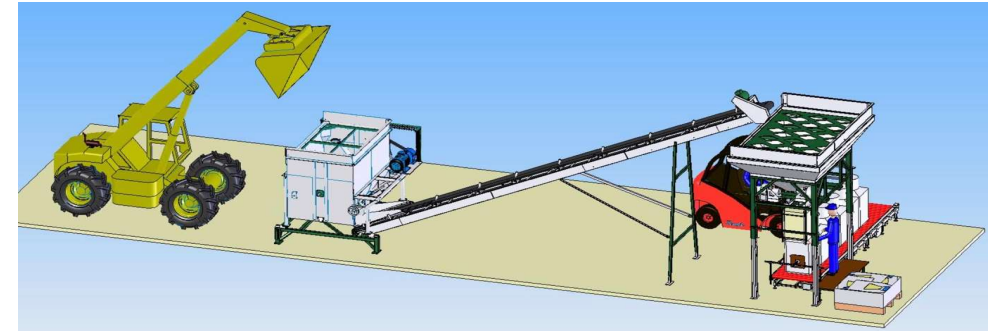
Other differences

Batch type	Continuous type
Does not require layering software	Requires layering and proportioning software
Transfers ingredients to mixer at high speed	Transfers ingredients to mixer continuously
Can be less expensive, except for the tower type	Can be more expensive depending on the number of bins required for setup
Can be more flexible in the amount of raw material that is used	The number of raw materials that can be used is limited to the number of intake bins

Types of bulk blending plants

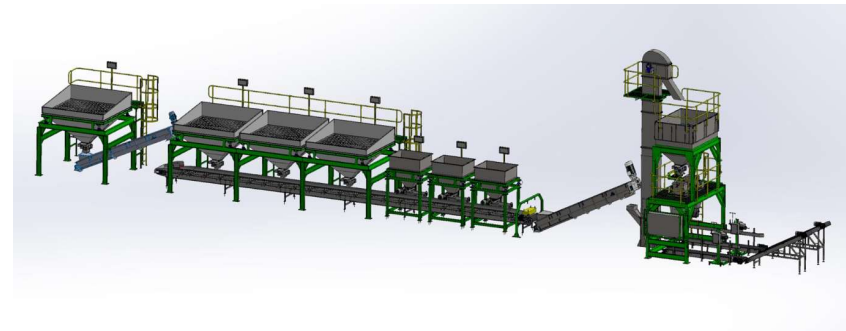
1. Batch type plants

- Vertical Auger blender type
- Horizontal drum blender type
- Paddle blender type
- Tower style blender type



2. Continuous type plants

- By weighing control
- By volumetric control



Batch type: Vertical Auger blender type



- For high capacity retail or wholesale use
- Capacity up to 300 tons per hour

Tower blend system with tapered Auger vertical blender (manufacturer: AGI Yargus)

Batch type: Horizontal drum blender type



- Very fast blending time
- Less than 5 minutes from weigh hopper to load out for 13 tons

Direct Drive Blender (manufacturer: Adams Fertilizer Equipment)

Batch type: Tower style blender type



Tower style blender
type

Tower blend system (manufacturer: AGI Fertilizer Systems)

Continuous type: By weighing control



- With declining weight impregnation system
- Operated by LEC's PLC control system

Decline-N-weigh blending system (manufacturer: Adams Fertilizer Equipment)



- Powder and liquid blending system
- Mixes fertilizers and coat liquids and powders
- Capacity of 400 tons per hour of Urea

Laycotte Dual Ribbon Auger (manufacturer: AGI Yargus)

On farm blend system



Speed King (manufacturer: Crustbuster)

Costs of a blending and bagging system

Throughput Capacity	Costs in US\$
≤ 30,000 mtpa	≤1 to 5 million (not applicable for continuous plant)
30,000 - 70,000 mtpa	5 to 10 million
70,000 - 150,000 mtpa	10 to 15 million
150,000 - 200,000 mtpa	15 to 20 million
over 200,000 mtpa	20 million and more

mtpa: metric tons per annum

Selecting the type of bulk blending plant

Exercise:

What do you need to take into consideration or what information do you need when **selecting** a type of bulk blending plant?



Selecting the type of bulk blending plant

1. What is the **available budget** to purchase a plant?
2. What **quantity** of blends will be produced **per annum**?
3. What **types** of blends will be produced **per annum**?
4. Types of **primary, secondary and micronutrients** needed:
 - a. Which type of micronutrient will be used (liquid, powder, granules)?
 - b. Do you anticipate the utilization of liquid micronutrients?
 - c. Which other materials may be added to the blends e.g., anti-dust, anti-caking, inhibitors, bio stimulants etc.?

Selecting the type of bulk blending plant

5. Performance requirements:

- a. What blending and bagging capacity should the plant have?
- b. At what rate per hour should it blend (the efficiency)?
- c. How precise should the blends and bag weights be (the accuracy)?
- d. How flexible should the plant be to multiple kinds of blend specification and quantity requests?

6. Which **operating system** should the plant have: manual or automated?

7. What are the **dimensions of the plant** (in order to determine the space requirements within the factory)?

Selecting the type of bulk blending plant

8. What **season(s)** should the products be provided e.g., rainy season farming, dry season farming, or both?
9. **How** will **raw materials** that are brought be stored in the warehouse?
 - a. In bulk, in bags, or both?
 - b. Will the raw materials be conditioned i.e., lump breaking, screening etc.?
10. Will a **loading equipment** be provided for the blending and bagging operations, e.g., front end loader?

Selecting the type of bulk blending plant

11. What **pack sizes** will be used for the **finished produce** e.g., 25kg, 50kg, 500kg, 1,000kg or in bulk?
12. **Available services** of plant suppliers
 - a. Do they provide after sales services?
 - b. In case there are after sales services: are they available in your country or is all service remotely?
 - c. Are spare parts available in stock or through quick shipments?

Checklist for selection plant type

Go to Exercise 2 in your workbook.

Go through the list and check:

1. Where or from who can you get this information?
2. Which information will be difficult to collect for you ?



Part 2: Setting Up a Blending Operation

2.3 Selecting the type of bulk blending plant