Banana Export Packing Procedure

Presented by....

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❖ Checklist for Banana Export 20MT or 23MT for 40 Ft Reefer Container

S.no	Particulars	Specification	Quantity (nos)
1	Fibre tank	500 Liters	2
2	Corrugated Boxes	18.5 Kg or 13.5 Kg	1080 or 1500
3	KMNO4	Ethylene Absorbent	2160 or 1500
4	Weighing Balance	For weighing Banana	2
5	Plastic crates	58x39x31 cm	300
6	Polythene bags	100 gauge, transparent	1100 or 1600
7	Foam sheet thin	2 mm thick White foam: insert in hands; ventilated foams as a separate between cluster/hands	
8	Foam sheets thick	6 mm thick black foam as a liner in plastic crate	

S.no	Particulars	Specification	Quantity (nos)
9	Vacuum sealer / Air remover	Eureka/Forbes	2
10	Pedestal fan	High capacity	2
11	Slanting trays	For weighing trays of 5x1.5 ft	2
12	Alum or Turti	5 Kg for cleaning banana	1
13	Bavistine Fungicide	750 Gms for fungicides treatment	1
14	Rubber bands	Big Pouches	3
15	Stickers	Company Stickers	8000
16	Finger Remover	Thread for removing	5
17	Hand Knife	For making clusters	2
18	Shoulder Padding materials		4 to 5
19	Pre cooling chambers	20 MT	1

Varieties

Varieties grow in India are Dwarf Cavendish (AAA, Robusta (AAA), Rasthali (Silk AAB), Grand Naine, Poovan (Mysore AAB), Nendran (AAB), Red Banana (AAA), Ney Poovan (AB), Virupakashi (AAB), Pachanadan (AAB), Monthan (ABB), Karpuravalli (ABB), Safed Velchi Musa (A B Group).

Varieties	Characteristics	Weight	Length	State
Grand Naine (G-9)	Tall statured plant and a heavy yielder with long cylindrical bunch.	25-35kg with 8-10 hands	15cm- 21cm and girth is 12-13 cm.	All over India
Dwarf Cavendish	Dark black brown blotches appear all along the stem.	20 kg with 8-10 hands	13cm-14 cm and girth 8-10 cm	Bihar, Tamil Nadu, Karnataka, Maharashtra, West Bengal, Assam, Nagaland and Meghalaya

Harvesting

Verify that the fruit complies with specifications, diameter or calibre, and age, based on age control conducted on the farms. This prevents the risk of premature ripening of the fruit sent to the market.

While measuring diameter it must be minimum 35 mm and above

Measuring diameter, before harvesting

Banana Harvesting Process

Bananas were harvested by hand using a two-person team. Firstly put the foam in between the fruit bunch to prevent the marks then One person should cuts and the other carries the bunch away. When cutting the bunch, a shallow cross cut was made with a cane knife in the stem facing the bunch. The weight of the bunch caused the stem to bend. At this point the bunch was then lowered onto the shoulder pad\ding of the second person and the bunch stem was cut.

Cutting hands and taking to Pack House

Field care

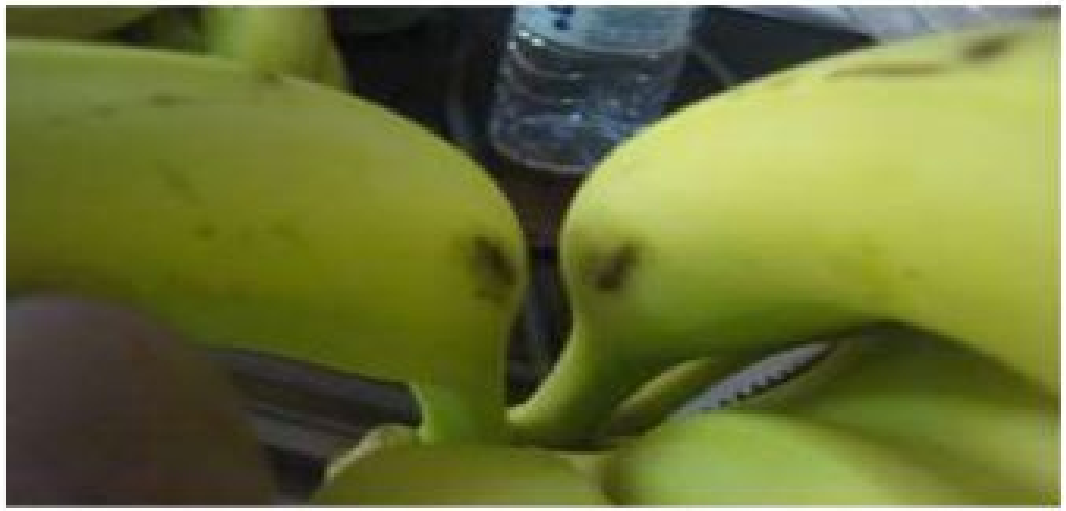
Cut it with the threads and make bunches and reject the damaged bunches and good one
Put it in a crates which is covered with 6mm thick foams and between each layers of banana
Put 2mm thick foam to prevent damages like marks patches and physical losses and take it to the packing house same 2mm foam we can reuse while packing boxes of banana.

Fruit selection and cluster preparation at pack house

1st Drum contains 500 literof water mixed with 5Kg of alum (Turti) wash it well and do the Fruit selection and cluster preparation as
Per the buyer requirement Please remove unwanted damaged banana at this point of time and pass the good one in second drum.

Points to be consider while selecting clusters

Dust between banana fingers



Damage due to Friction of dust

Damage due to strong solar radiation – burning of bunches

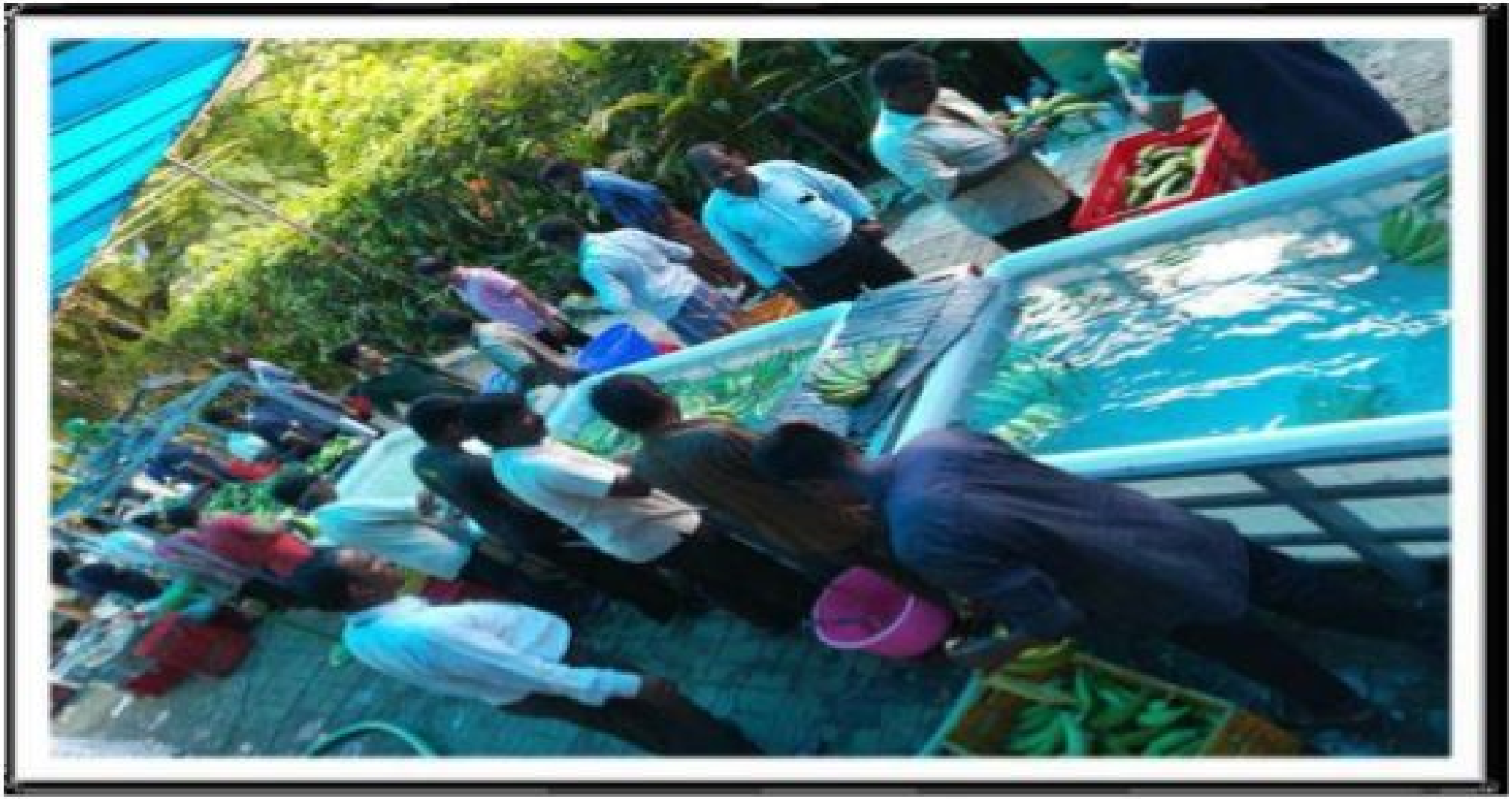
Points to be consider while selecting clusters

Black spots,scraches due to Mosquito bites, Aphids,jassids attacks and climatic effects should be Strictly rejected. And also if there is any scraches while unloading that also must Be rejected on the spot.

Ideal Banana Clusters should look like this

The cluster must be either 5 to 7 only.

No other cluster to be considered



2nd Drum contains 500 liters of water mixed with 750gm of Bavistin Fungicide the most effective postharvest control of crown rot is provided by Deeping banana For 10 Minutes in it and then proceed for Further Process.

Weighing the Clusters

Weight the cluster and make one box weight either 18.5Kg for European countries and 13.5 Kg for Middle East Countries and then put on table for air drying make one row on table for each box to have a easy access.

Banana Waxing Coating

After Removing from Fungicide drum put wax on banana Cluster.
Tools: Nipro fresh wax And A soft cloth or soft brush is used to apply it

Nipro Fresh Wax Coating for Banana has the following advantages:

- Reduces Weight Loss
- Maintains Freshness and Firmness
- Reduces spoilage during transportation and storage
- Enhances original texture and color of the fruit

Nipro Fresh Fruits Vegetables Waxes are completely safe for use and is made from US FDA approved components.

➢ **Wax Must be Applied and cover the cluster surface clearly and make sure to make it dry before we pack it into the box.**

Air Drying

the hands were air dried by placing the hands in the cushioned drying tables through air drying. High capacity fans should be mounted on the wall or at the top to provide air for the faster removal of water from the skin after drying for 10minutes the operator must control the banana and the wax on the cluster should be perfectly dry.

Labeling

This is done to identify the product by putting a special sticker that identifies the brand being produced on the middle of the front half of the fingers of each cluster. This can also be done according to the client's specifications. This has to be done in such a way that the stickers do not fall off, thus guaranteeing the proper identification to the consumer. The glue and all other materials used for the stickers must comply with the relevant gluing standards for safe, innocuous, and organic human consumption.

Making of Boxes

- Instead of favicol please use Arobond 555 for a better sticking results while making boxes.
- Make sure to remove the aeration holes while making boxes.
- Press the box in pressing machine and arrange properly near the packing Labours.

Packaging

Before starting to actually place the fruit in the box, outside the plastic bag that will be used the medium and straight clusters are placed on the **first row with the crowns facing** the packer. This must be done taking into consideration the overlap between clusters so as to form a good package. Next, the small clusters are placed on the **second row. In additional,** between 1st row and second row a separator must be inserted showed as below Pic.

1st row and second row a separator

2 mm foam sheet

Between each clusters placed foam to avoid scratches

Packaging

Once these two rows have been formed, the spacer that was placed on the part of the box near the packer is removed. It is then protected with the paper film for separation in order to avoid damages to the fruit placed on the first row caused by the crowns of the fruit that will be placed on the **third row. This row is formed using the large and curved** clusters on the tray and leaving a good overlap between the clusters. Next, the spacer placed in front of the packer is removed and the second row is protected with the paper film for separation, taking into account that it also has to cover the separation between the tips of the third row and the **fourth row. This row is formed by placing the large and** straight clusters, with a distribution that always gives the impression of a full box and considering the overlap of the clusters placed there. After the package has been prepared, the used plastic should be reused to cover all the fruit placed in the box. This can be done by overlapping or by closing the plastic bag with rubber bands to extract the air from the vacuum packages, depending on the destination market of the final product as showed in next slide.

For 18.5 kg (Europe) and 13.5 kg (Middle East) boxes should be follow the above procedure to make 4 rows, Respectively.

Packaging

Packing: first row

Packing: second row

Packing: third row

Packing: fourth row

Putting KMNO4, Removing vacuum and Reweighing

The air dried hands were weighed and packed in the 100 gauge polypropylene bags which was lined in the 5 ply corrugated fiber board boxes holding an average fruit weight of 13.5 kg for Middle East and 18.5 kg for Europe. Two pouches of KMnO4 on each side, an ethylene absorbent were used to control the ethylene release and to enhance the shelf life. The air was removed from the polyethylene bag using vacuum. Reweight the banana along with boxes to make final weight.

Packing: close plastic bag with rubber band

Pouches of KMnO4

Check weight before palletizing

Loading or palletizing the packed boxes

After Making boxes make the pallets put 6 boxes on one pallets and make 9 layers of same. 54 boxes will come on one pallet and then tight that boxes using black or white strips. Make sure to seal each row horizontal and above two strips should be packed vertically. **Furthermore, four side V Channel should be put on the four corner of boxes mounted on pallets.**

Loading or palletizing the packed boxes

After sealing each row in a horizontal way above two rows should be sealed like shown in picture.

make sure to pass the top row strip from inside the aeration holes of boxes to make a good grip and then two rows must be seal vertically.

Loading of the container

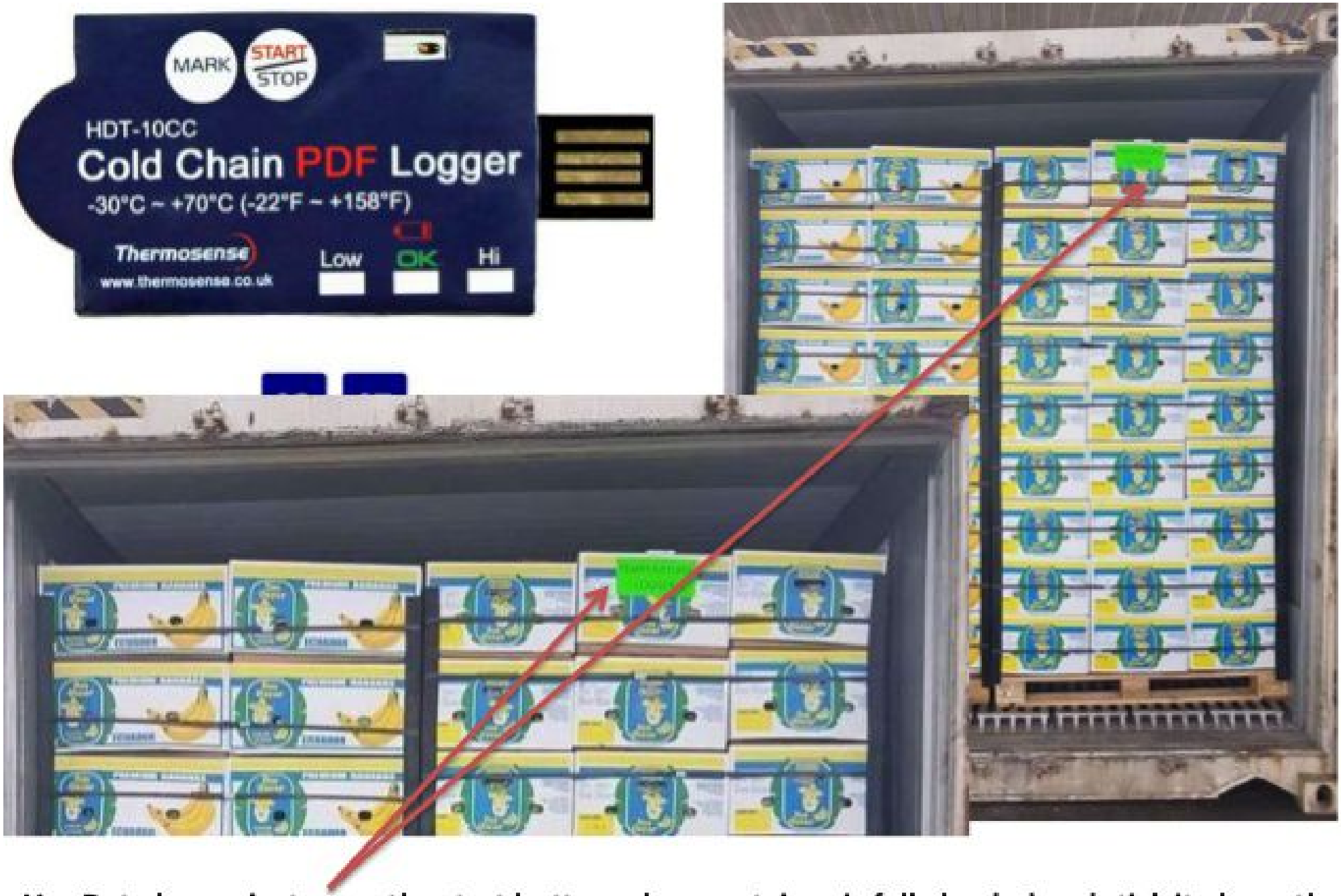
From Pre Cooling chamber to the Container Palette should be moved as per the photo With the help of manual fork lift for the same make sure floor is flat for the easy movements of Pallets directly into the container and if Automatic forklift is available only use electrical one Avoid using diesel forklift which produces hazardous gases which can damage Banana. And make sure to do the operation in minimum time to avoid variation of temperature which can Affect the quality of Banana.

Loading or palletizing the packed boxes

Typical: 54 boxes per pallet (9 layers of 6 boxes)

Typical: 20 pallets per container (= +/- 20 TM)

Loading the container at the Pack house using fork clipper



Use Data logger just press the start button when container is fully loaded and stick it above the Last pallet which has been loaded inside the container. Stick it on container wall with tape.

After putting the data logger lock the container properly and seal it with one CHA seal & one Custom seal.