Banana Tissue Culture Plantlets & Banana Bunchy Top Virus (BBTV) Control & Prevention

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OBTAIN CLEAN PLANTING MATERIALS:

Why the use of tissue culture?

BBTV testing kit showing negative results.

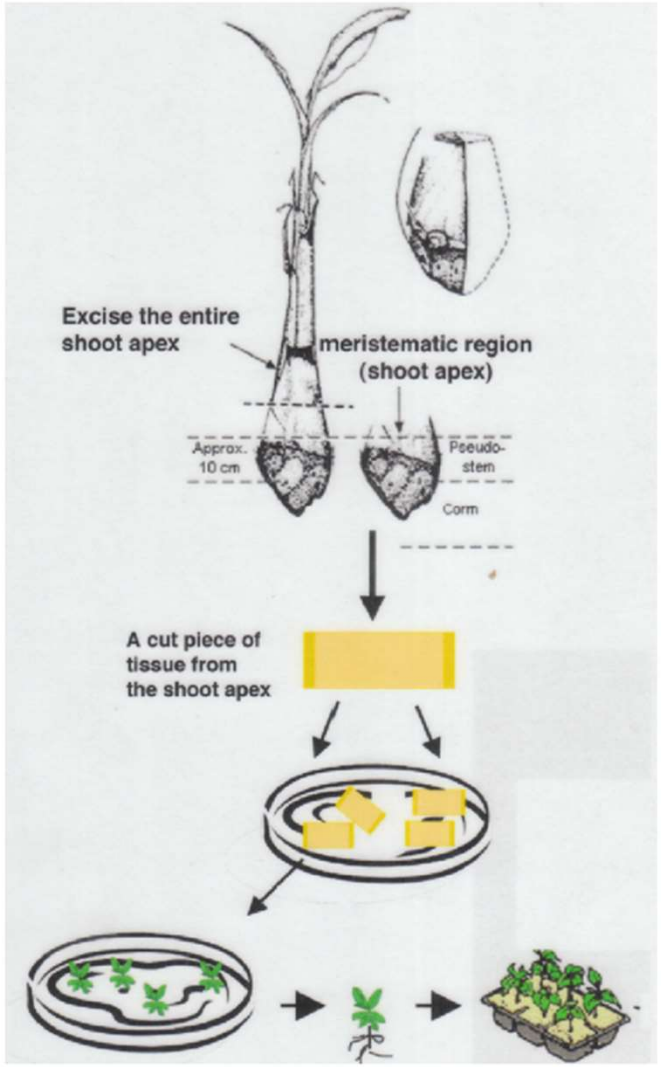


Fig. 8-1. Illustration of banana shoot tip culture (Hooks and Perez).

Managing Tissue Culture Plantlets:

12-18 months to receive tissue cultured plantlets.

Tissue culture banana plantlets lack wax at first.

Preparing Plantlets for Field Condition

- Fertilize plantlets with slow release fertilizer.
- Transfer plantlets to partially shaded areas to be hardened.
- Transplant plantlets to the field.

In case of using Banana keikis as propagation materials:

NOTE:

- It takes 20-85 days for BBTV to show symptoms on infected banana plants in Hawaii.
- Observe banana keikis before and after transplanting regularly to make sure they are not infected.
- If the mother is infected with BBTV, there's a big chance the keiki are infected too without showing symptoms.

Banana plant showing BBTV infection symptoms

Field Inspection & Destroy BBTV Infected Plants:

Removal of infected plants early will reduce spread of the infection & overall health of the field.

1. Identifying and destroying virus-infected plants as early as possible.
2. Scout for banana aphids, always spray insecticides on BBTV infected plants before rogueing to avoid spread.
3. Banana takes 5 days to unfold a new leaf. Be suspicious of infection if new leaves do not unfold in time.

Round Up injection

For every 2 inches diameter of banana pseudostem, inject 1 ml of Round Up

Aphids-Ants Relationship & Aphids Natural Enemies

Ants benefit from aphids excess sugar from feeding on plant juice.
Ants protect aphids & kill aphids's natural enemies.

Examples of Approved Insecticides for Banana:

Examples of synthetic insecticides approved for banana in Hawaii.

Product Name	IRAC Group	Active Ingredients (A.I.)	EPA No.	Rate per acre	
				From	To
Admire Pro	4A	Imidacloprid	264-827	14.0 fl oz Soil, 2.8 fl oz Foliar	
Sivanto Prime	4D	Flupyradifurone	264-1141	10.5 fl oz	14.0 fl oz
Movento	23	Spirotetramat	264-1050	16.0 fl oz	
Evergreen Pro 60-6	3A	Pyrethrins+Piperonyl butoxide	1021-1770	2.0 fl oz	12.6 fl oz
Tersus	3A	Pyrethrins	1021-2616	4.5 fl oz	16.3 fl oz

Examples of organic insecticides approved for banana in Hawaii.

Product Name	IRAC Group	Active Ingredients (A.I.)	EPA No.	Rate per acre	
				From	To
M-Pede	N/A	Potassium salts of fatty acids	10163-324	1% v/v	2% v/v
Neemix 4.5	UN	Azadirachtin	70051-9	5.0 fl oz	7.0 fl oz
PyGanic EC 5.0	3A	Pyrethrins	1021-1772	4.5 fl oz	15.61 fl oz
Trilogy	UNE	Neem oil	70051-2	1% v/v	2% v/v
Debug Turbo	UN+UNE	Azadirachtin+Neem oil	70310-5	32.0 fl oz	104.0 fl oz

Disclaimer: Mention of a trademark or proprietary name does not constitute an endorsement, guarantee, or warranty by the University of Hawaii Cooperative Extension Service or its employees and does not imply recommendation to the exclusion of other suitable products. Pesticide use is governed by state and federal regulations. **Read the pesticide label to be sure that the intended use is included on it, and follow all label directions**.

Insecticide Rotation for Banana to Control Aphids:

The use of at least 3 products and applying them in a rotation will ensure:

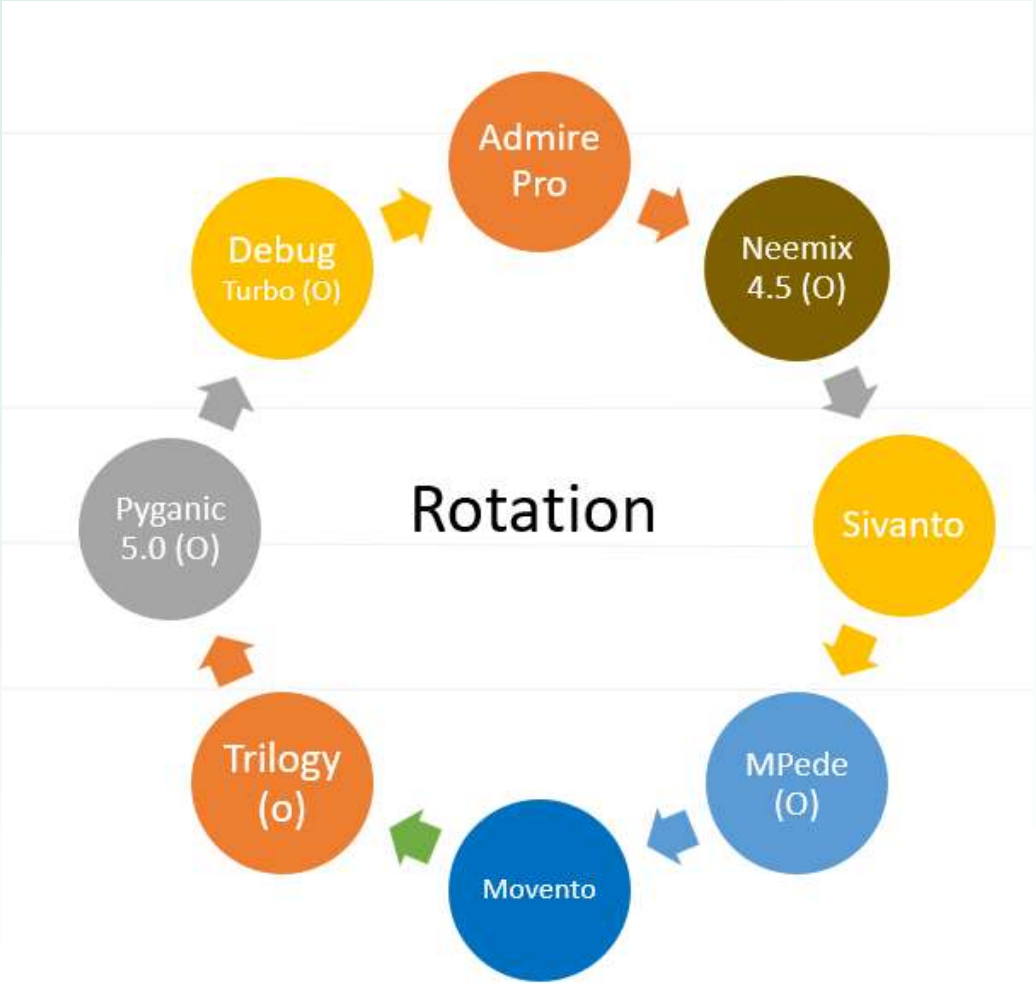
1) Protecting banana plants for longer period.

2) Not reaching application limits on all the products.

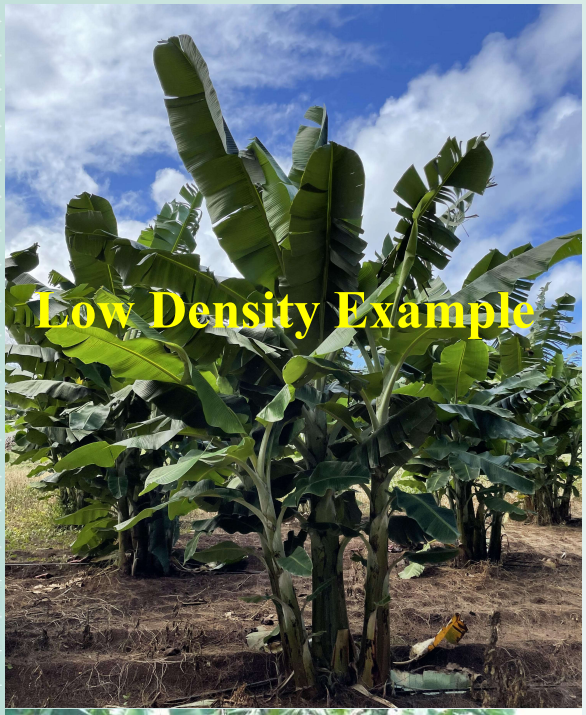
3) Reduce the chance of pest building resistance.

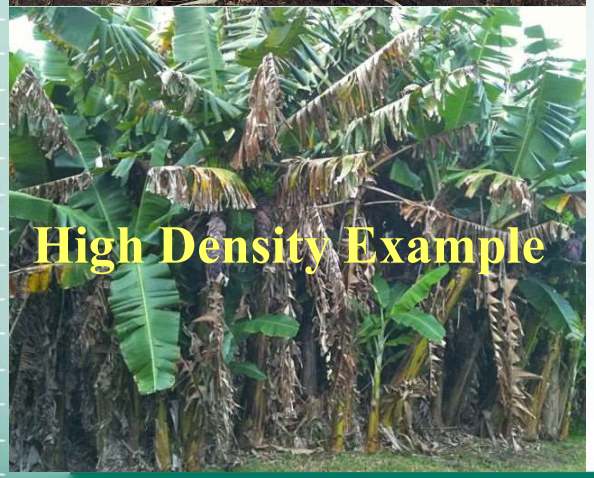
4) Different mode of action.

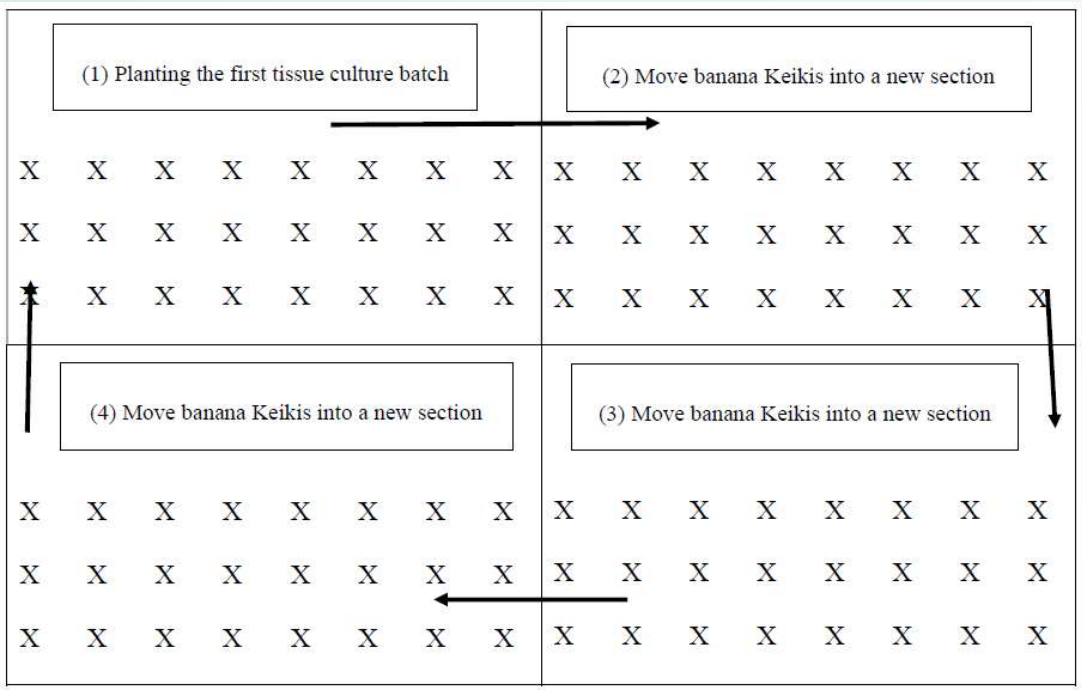
5) Reduce the need for higher concentration or application frequency from each insecticide.



Crop Rotation Plan for Banana Orchard:







Crop rotation design to ensure keeping banana orchard at low density.

The rotation sections don't have to be adjacent to each other.

Low density is better for pest control & crop management purposes.

Extension Bulletin:

COOPERATIVE EXTENSION
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Transitioning Tissue Culture Banana Seedlings from Lab to Field

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Tissue or micropropagation is an artificial method for multiplying plants in a short duration of time using the tissue or cell culture technique in a controlled environment. This method was selected to produce genetically identical, pathogen-free banana plants in Hawaii. Disease-free does not equal disease-resistance to Banana Bunchy Top Virus (BBTV). **Through our program, plants produced via the micropropagation are verified to be clean of BBTV and ready to be planted.**
There are many benefits for the utilization of micro-propagation, including:

Figure 1: Rooted banana plantlets ready to be moved into the nursery.

Thanks for listening