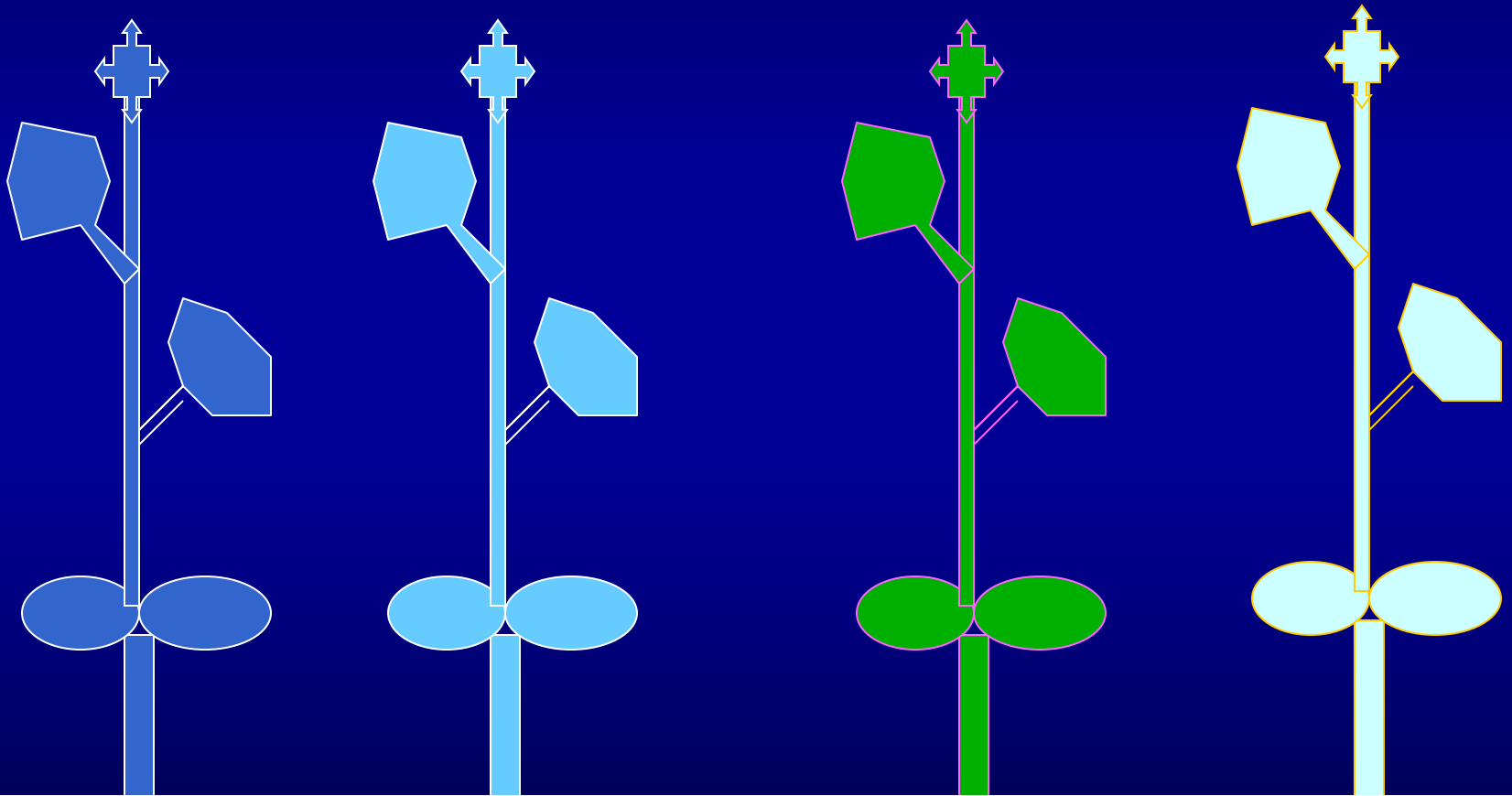


GRAFTED VEGETABLE TRANSPLANTS: A METHOD TO OVERCOME BIOTIC AND ABIOTIC STRESS

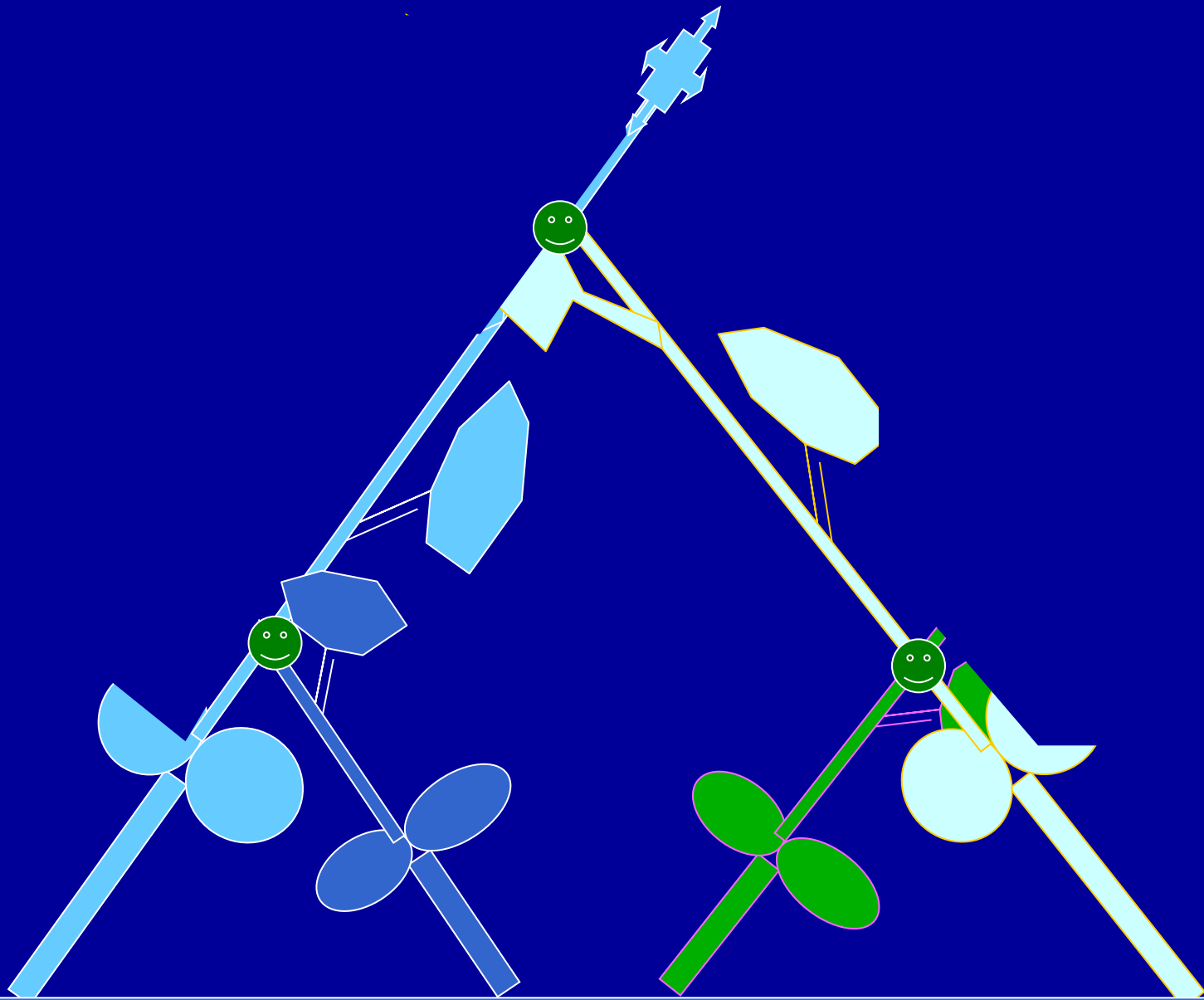
AMNON KOREN
HISHTIL



Earliest recording on herbaceous grafting was found in China (510) and in Korea (1710) using gourd.



GRAFTING 1500 YEARS AGO

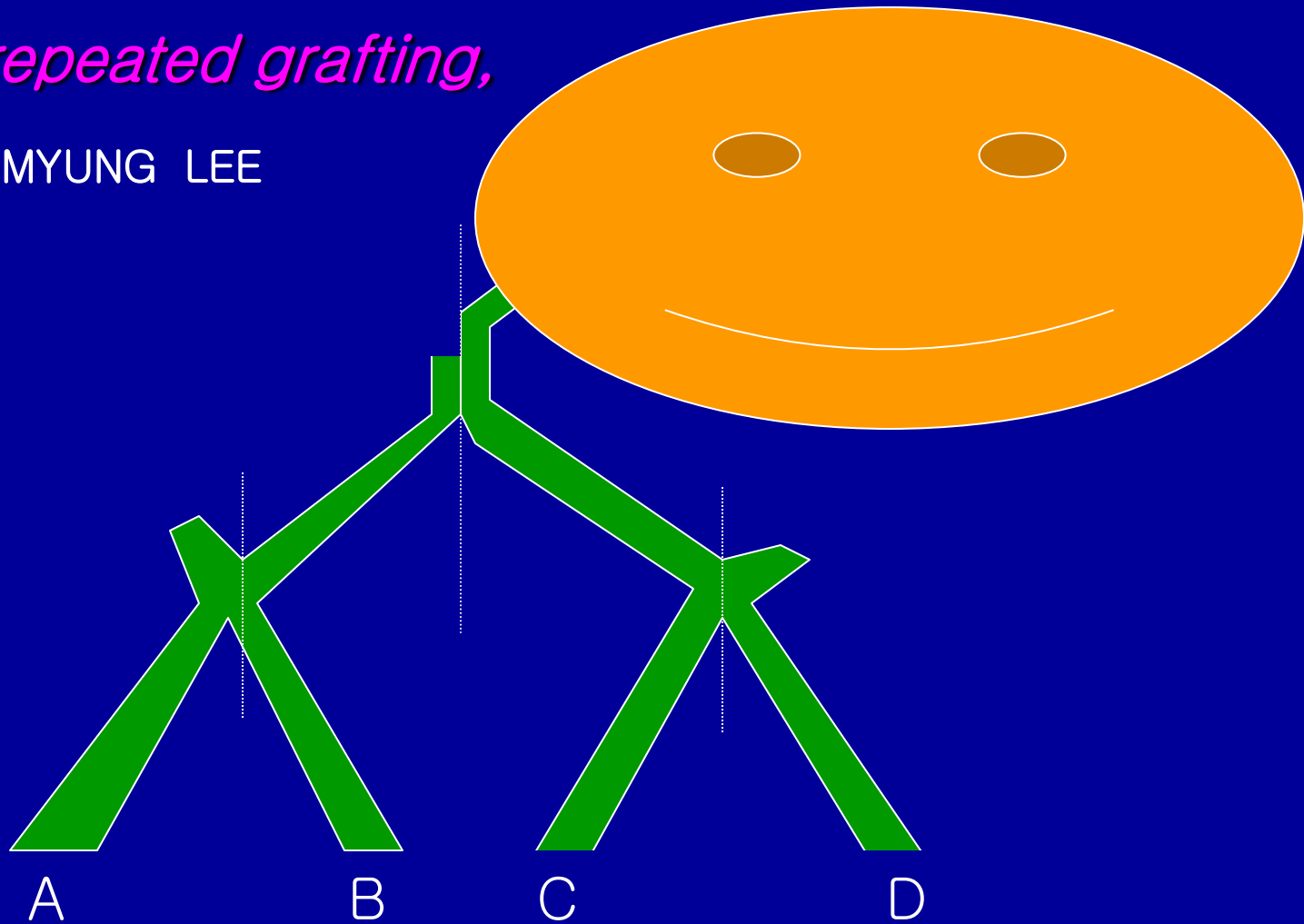


After a certain period of growth,

One plant (stem) on four root systems!

By repeated grafting,

JUNG MYUNG LEE



AD 510



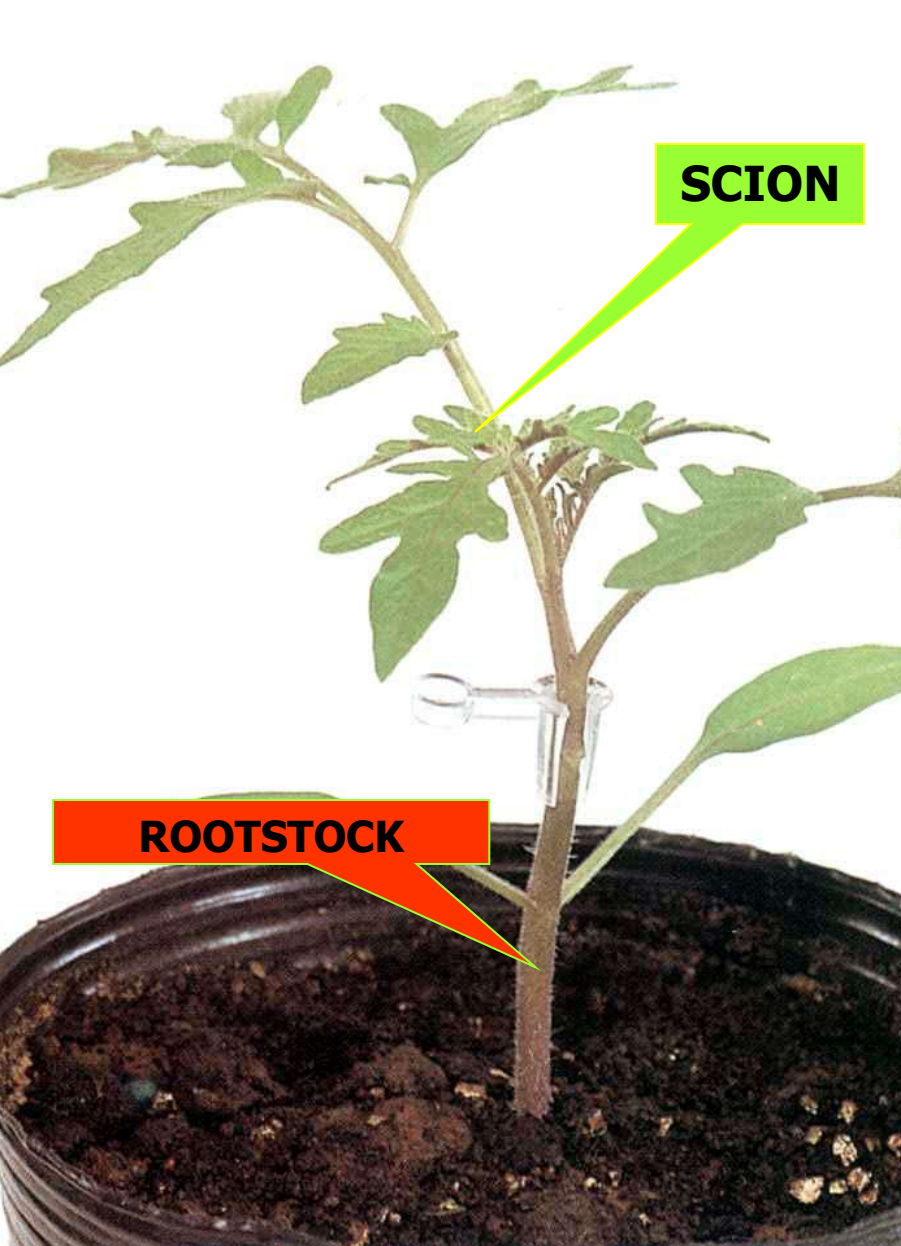
They were able to produce large gourds that can hold 200 liter of rice for a long-term storage!



EGGPLANT ON POTATO



TOMATO ON POTATO



Tomatoes, grafted onto tomato rootstock (left) or on potato (right)



**STRONG
ROOTSTOCK**

**NORMAL ROOT
SYSTEM**

A photograph of tomato plants in a greenhouse. The plants are growing vertically, supported by a trellis system. The plants on the left are labeled 'WEAK ROOTSTOCK' and the plants on the right are labeled 'STRONG ROOTSTOCK'. Both are labeled 'NOT GRAFTED'. The plants on the right are significantly taller and denser than the ones on the left. The greenhouse structure is visible in the background.

WEAK ROOTSTOCK

STRONG ROOTSTOCK

NOT GRAFTED

THE PERFORMANCE OF GRAFTED PLANTS



GRAFTED PLANTS AND BIOTIC STRESS



GRAFTED WATERMELON GROWN IN INFESTED SOIL





Melon Necrotic Spot Virus

WATERMELON UNDER INFESTED SOIL

GRAFTED

CONTROL



HONDURAS SOLARIZATION AND VAPAM



HONDURAS AFTER SOLARIZATION AND VAPAM



CONTROL

GRAFTED



NOT GRAFTED

GRAFTED

CUCUMBER FUSARIUM CROWN ROT



NOT GRAFTED

GRAFTED

TOMATO FUSARIUM WILT

NOT GRAFTED

GRAFTED



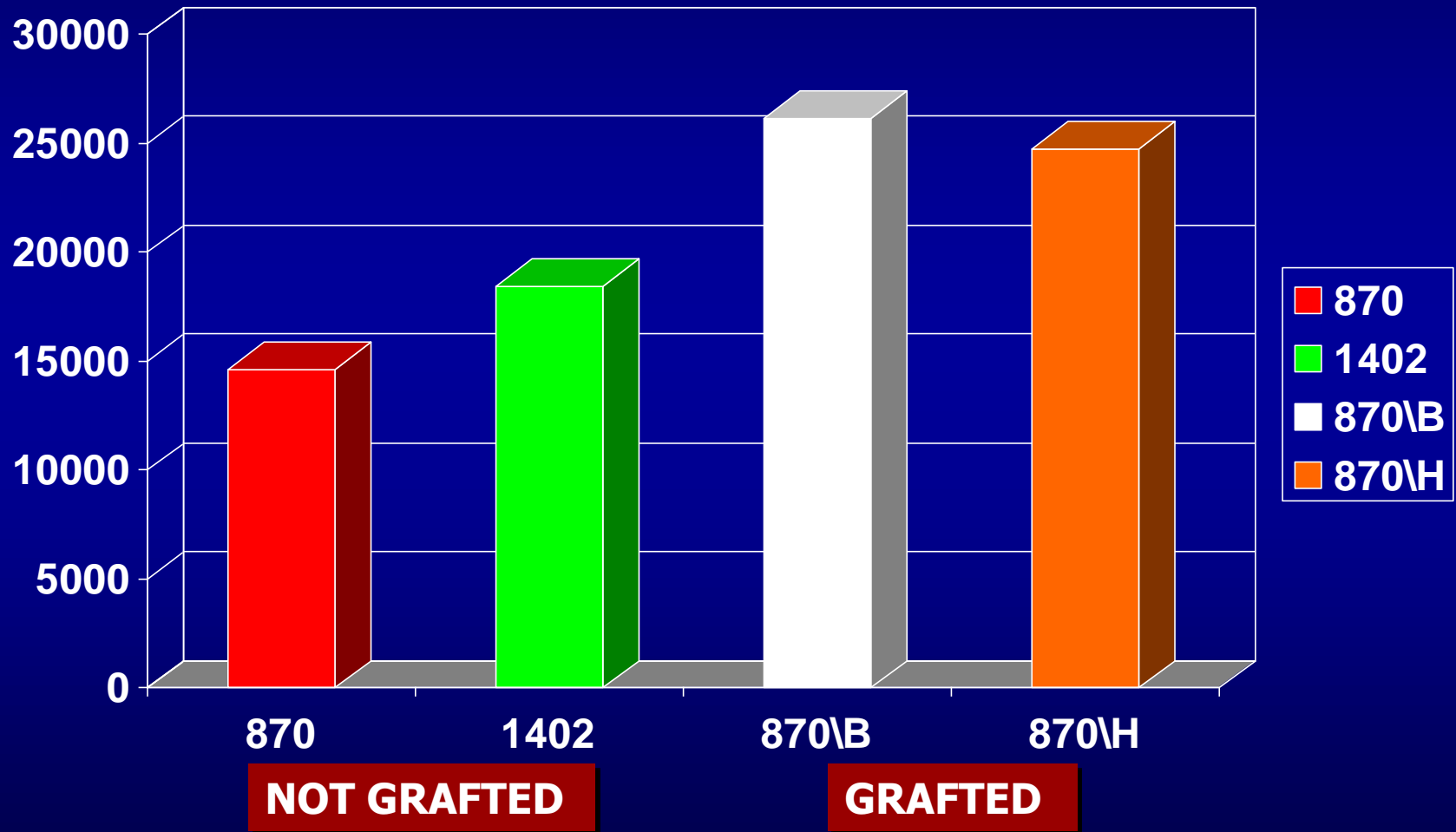


FUSARIUM CROWN ROT



NEMATODES

THE EFFECT OF NEMATODES ON THE YIELD



GRAFTED TOMATO AND CHEMICAL SOIL DISINFECTION



RESISTANCE TO NEMATODE BREAKS AT SOIL TEMPERATURE OVER 28 CELCIUS





STRONG ROOTSTOCK & STRONG SCION

OVER VEGETATION



CLUSTERS - UNORIENTED



UNBALANCE

A photograph of a tomato field showing rows of plants. The plants have thick, green stems and are heavily laden with clusters of small tomatoes. The tomatoes are mostly green, with some beginning to turn red. The ground is dry, sandy soil. The plants appear to be growing in a field with some irrigation infrastructure visible at the base.

WEAK ROOTSTOCK

CLUSTERS - UNIFORMITY

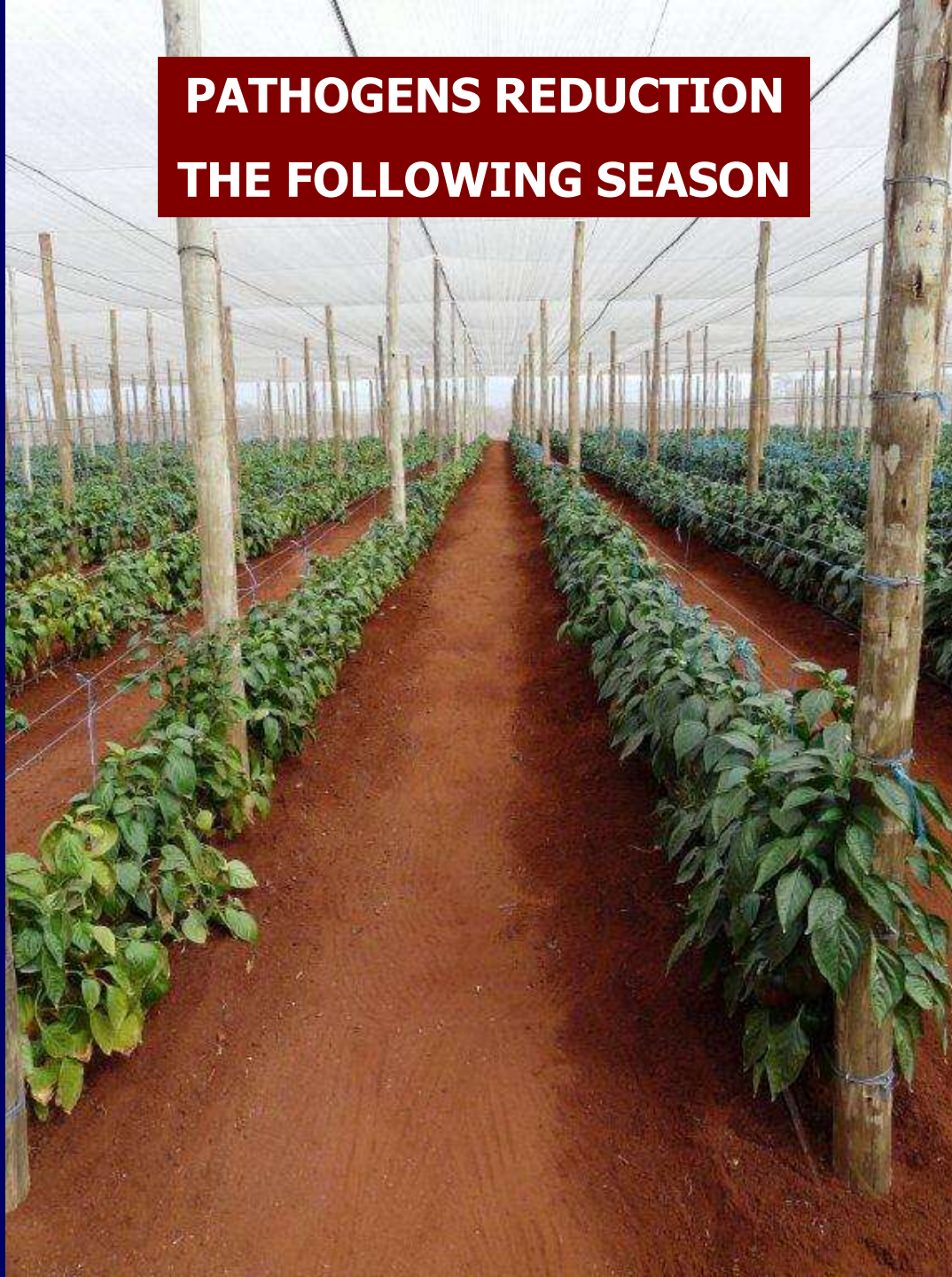
PEPPER - NEMATODES



GRFTED

CONTROL

**PATHOGENS REDUCTION
THE FOLLOWING SEASON**



CUCUMBER GREEN MOTLE VIRUS





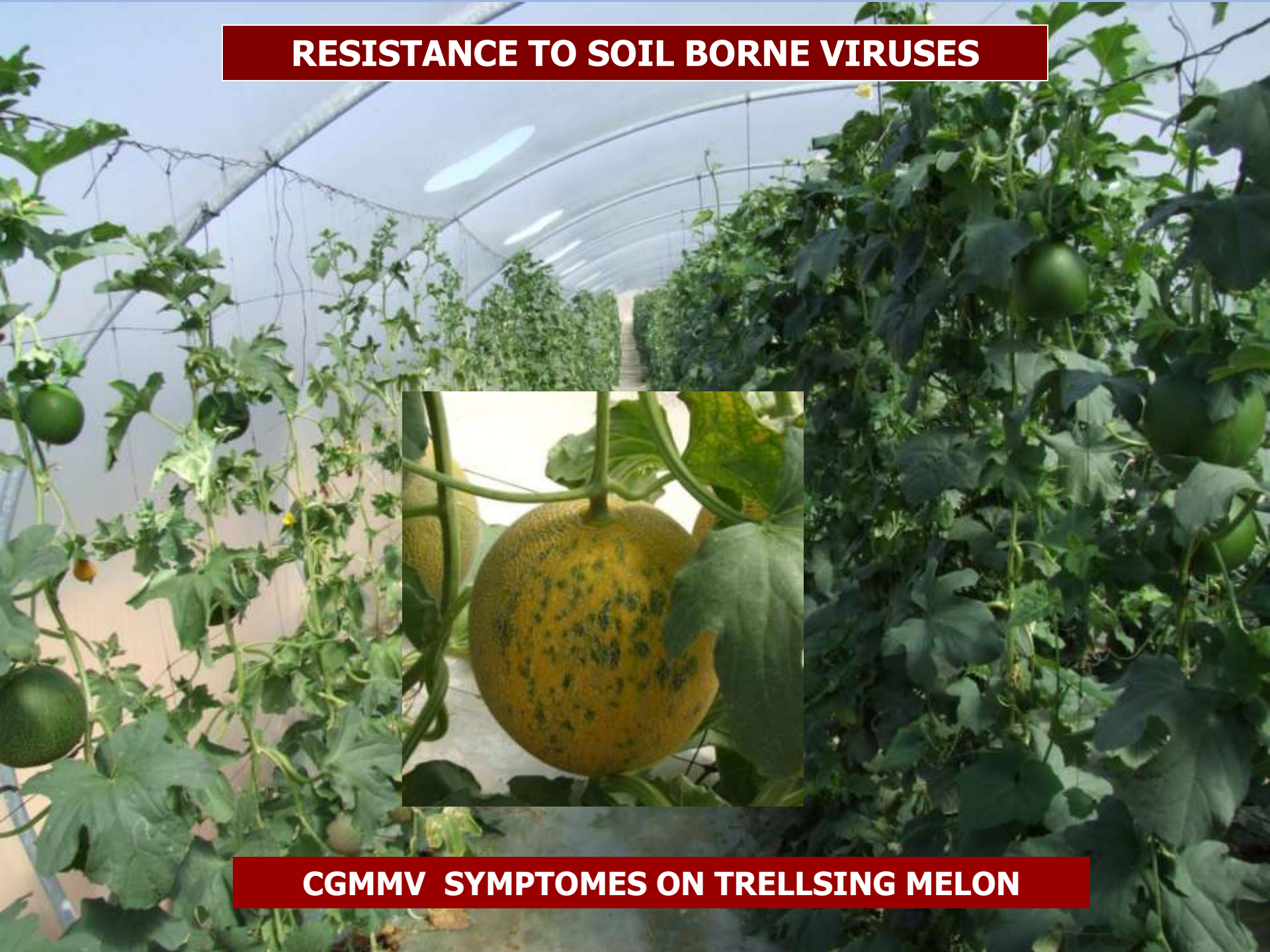
CGMMV

CGMMV IN WATERMELON



CGMMV

RESISTANCE TO SOIL BORNE VIRUSES



CGMMV SYMPTOMES ON TRELLISING MELON

CGMMV: DIFFERENT ROOTSTOCK INOCULATION

ROOTSTOCK	DISEASED PLANTS	TOTAL TESTED PLANTS	%
TZ 148	14	16	87.5
VICTORIA	3	11	27.3
HA 35009	7	19	36.8
A 101	5	9	55.6
NURIT	3	18	16.7

ROOTSTOCK	SCION	DISEASED PLANTS	TOTAL TESTED PLANTS	%
TZ	6023	16	20	80
NURIT	6023	0	24	0
VICTORIA	6023	1	22	4.5
DORIT	6023	0	24	0



GRAFTED - AK

GRAFTED - TZ

Effect of grafting on CGMMV progress in cucumber, Naama, 2013

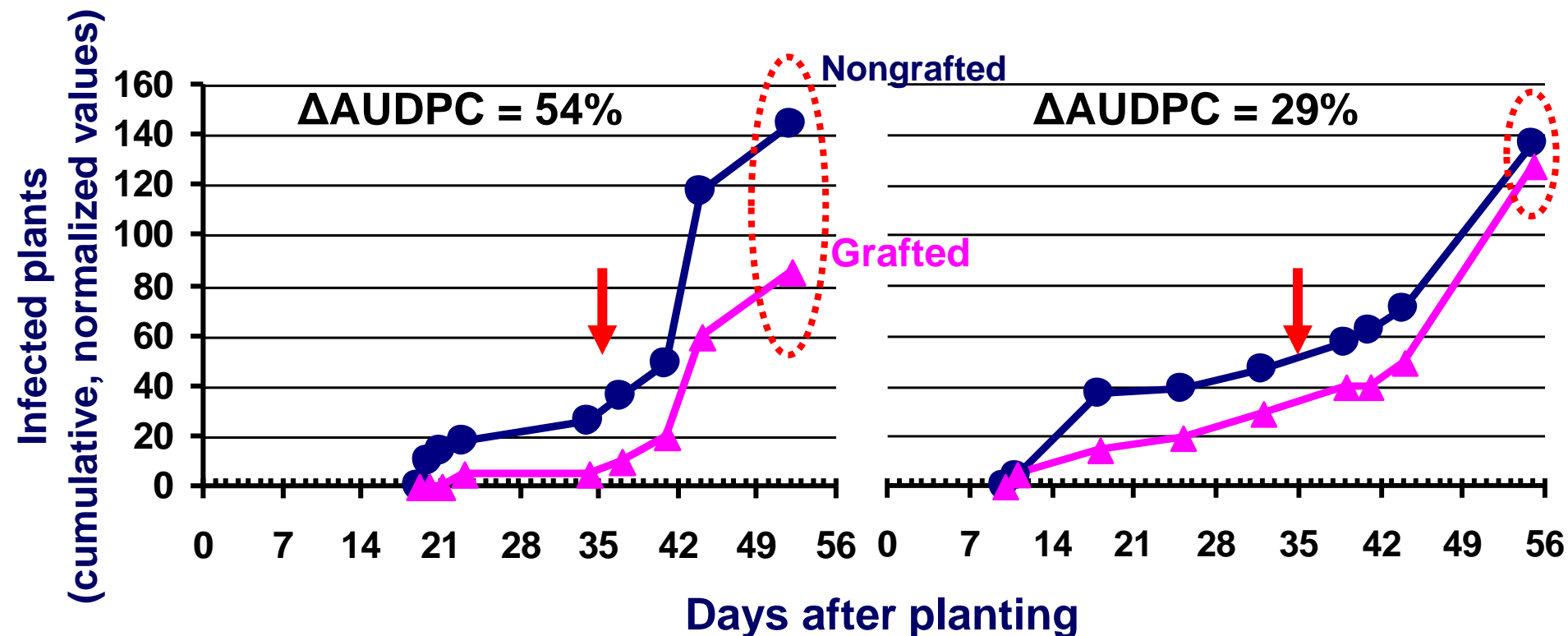
Greenhouse no. 5: at 4.2.13 3500 seedlings and 900 grafted (TZ) were planted.

Greenhouse no. 7: at 25.2.13 3600 seedlings and 900 grafted (Nurit) were planted.

The infected plants were counted and removed weekly

Greenhouse 7: Nurit rootstock

Greenhouse 5: TZ rootstock



*AUDPC = Area Under Disease Progress Curve

RESPONSE OF GRAFTED PEPPER TO PMMoV (TOBAMOVIRUS) INFECTED SOIL

S – RAMIRO



R = SNOOCKER



PMMV 3

PMMV 0

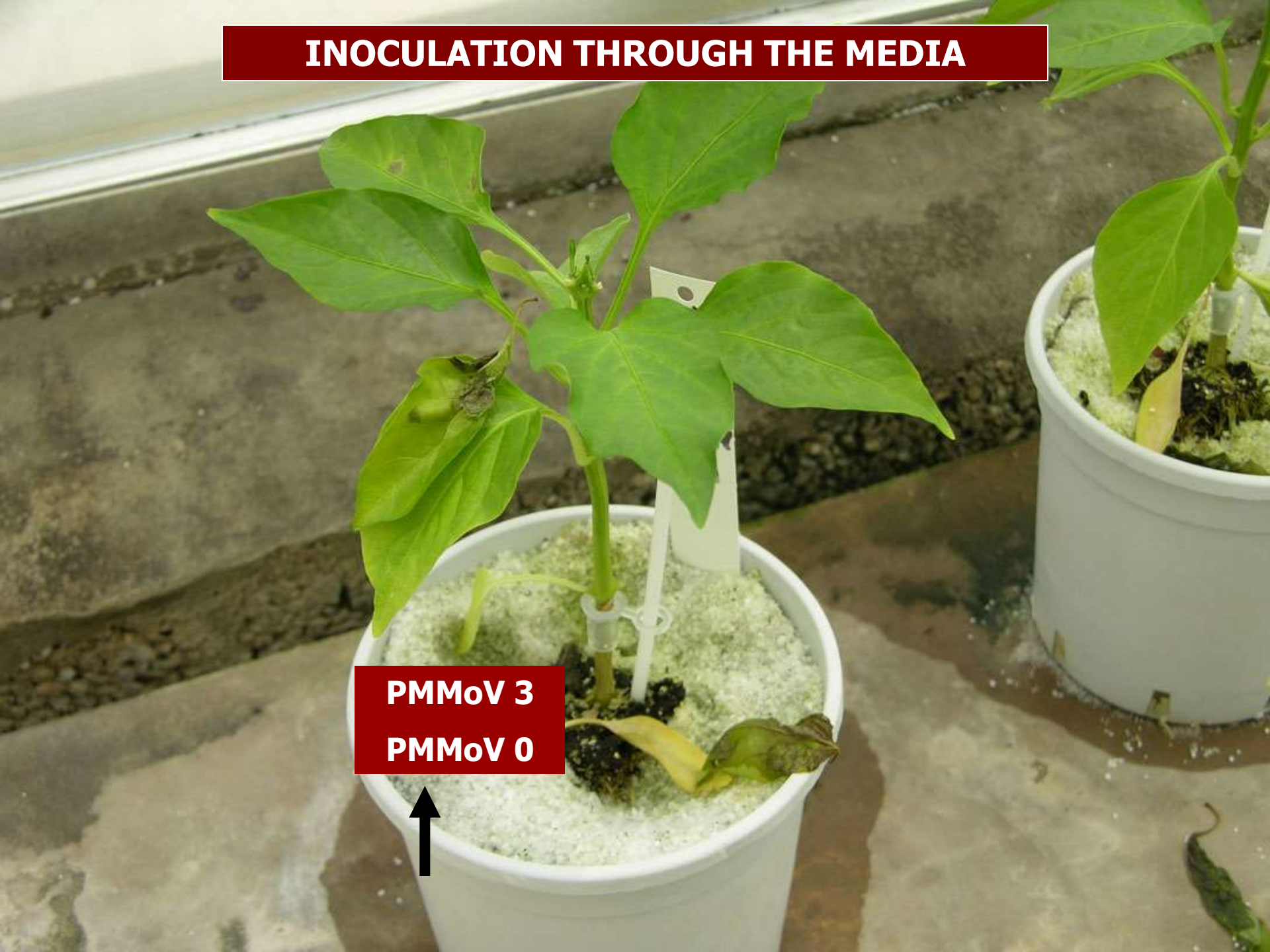
PMMV 0

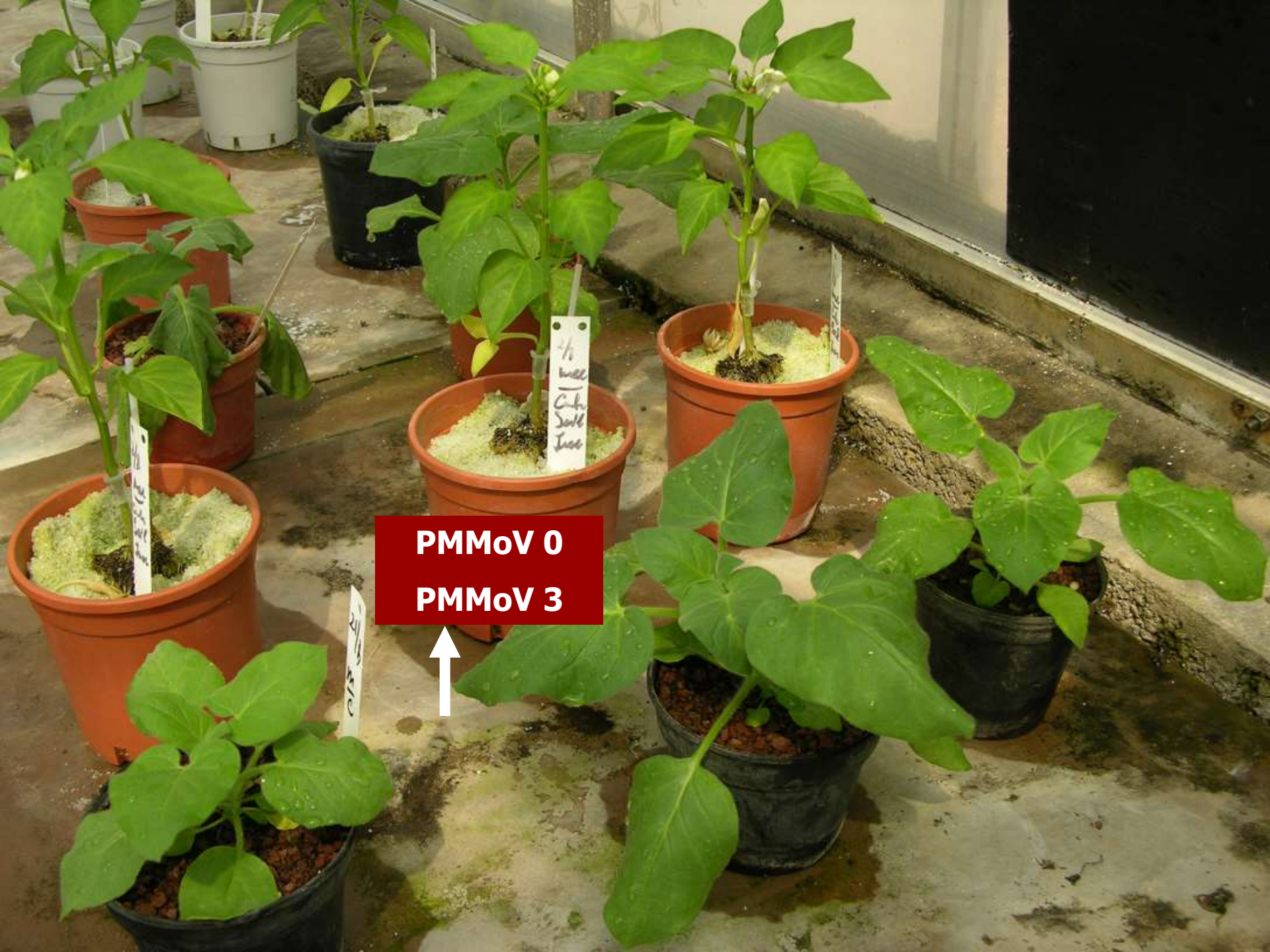
PMMV 3

INOCULATION THROUGH THE MEDIA

PMMoV 3

PMMoV 0



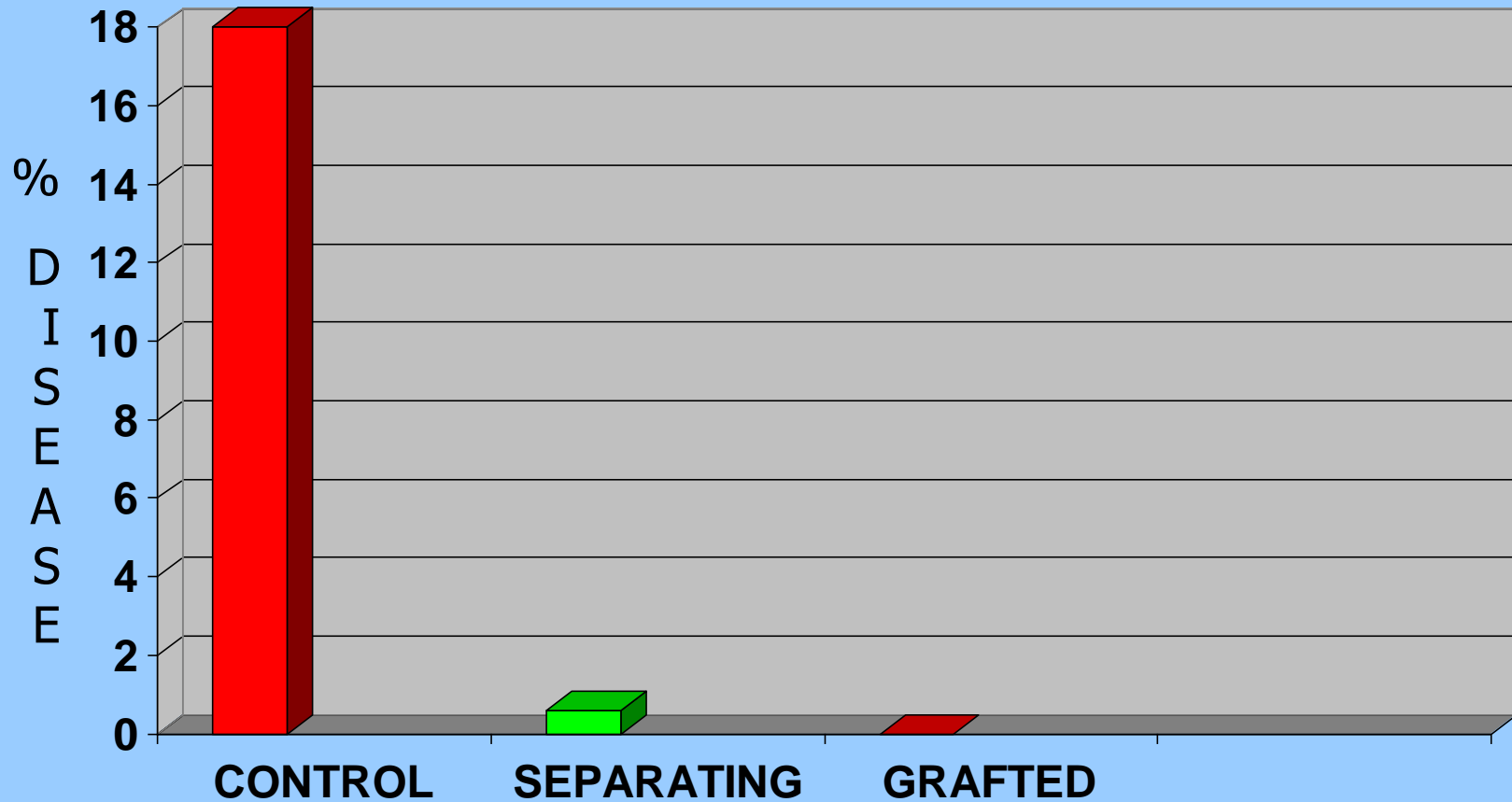


PMMoV 0

PMMoV 3



TREATMENTS EFFECTS ON PMMV INOCULATION THROUGH THE SOIL



THE EFFECT OF ROOTSTOCK ON AIR BORNE VIRUS



TOMATO CHLOROTIC VIRUS



TURKEY 2013

ALEGRO / BEAUFORT

ALEGRO / 505



TURKEY 2014

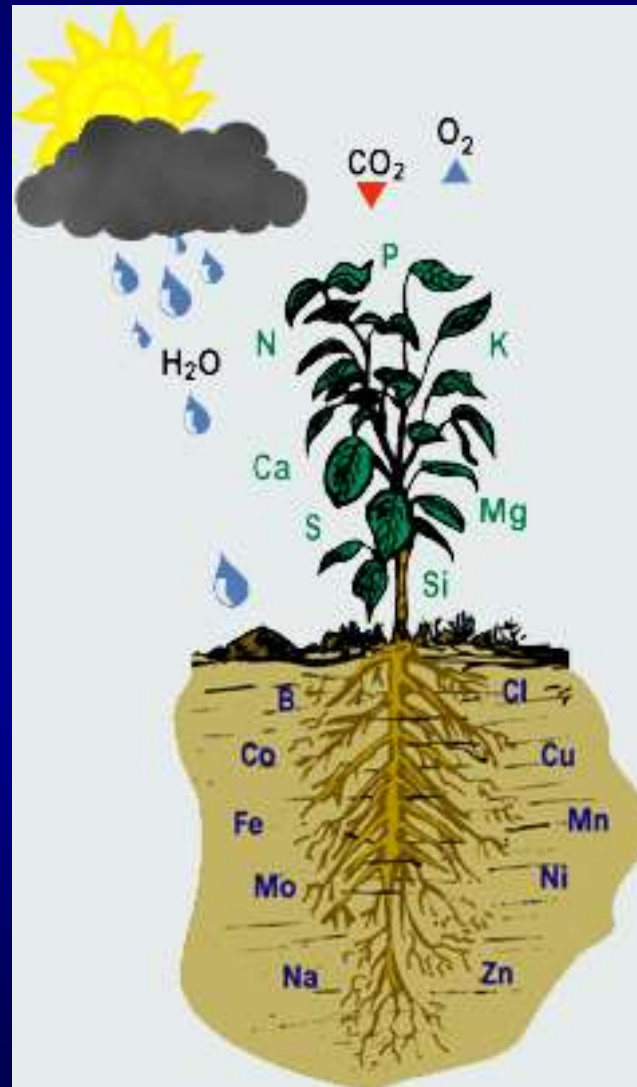
The image shows two tomato plants side-by-side. The plant on the left, labeled 'ROOTSTOCK A', has dark green, healthy-looking leaves and several red tomatoes. The plant on the right, labeled 'ROOTSTOCK B', has many yellowed and damaged leaves, indicating a viral infection, though it also has some red tomatoes. The background is a simple outdoor setting with soil and some other plants.

ROOTSTOCK A

ROOTSTOCK B

THE EFFECT OF ROOTSTOCK ON SCION VIRAL INFECTION

GRAFTED PLANTS AND ABIOTIC STRESS



GRAFTED PLANTS AND ABIOTIC STRESS

EC = 4.5

SALT STRESS

NOT GRAFTED

Yield	total	fruit
313	5.9	6.13

GRAFTED

313\TZ	9.8	7.68
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8404 (25)

LOW TEMPERATURE



NOT GRAFTED

LOW TEMPERATURE



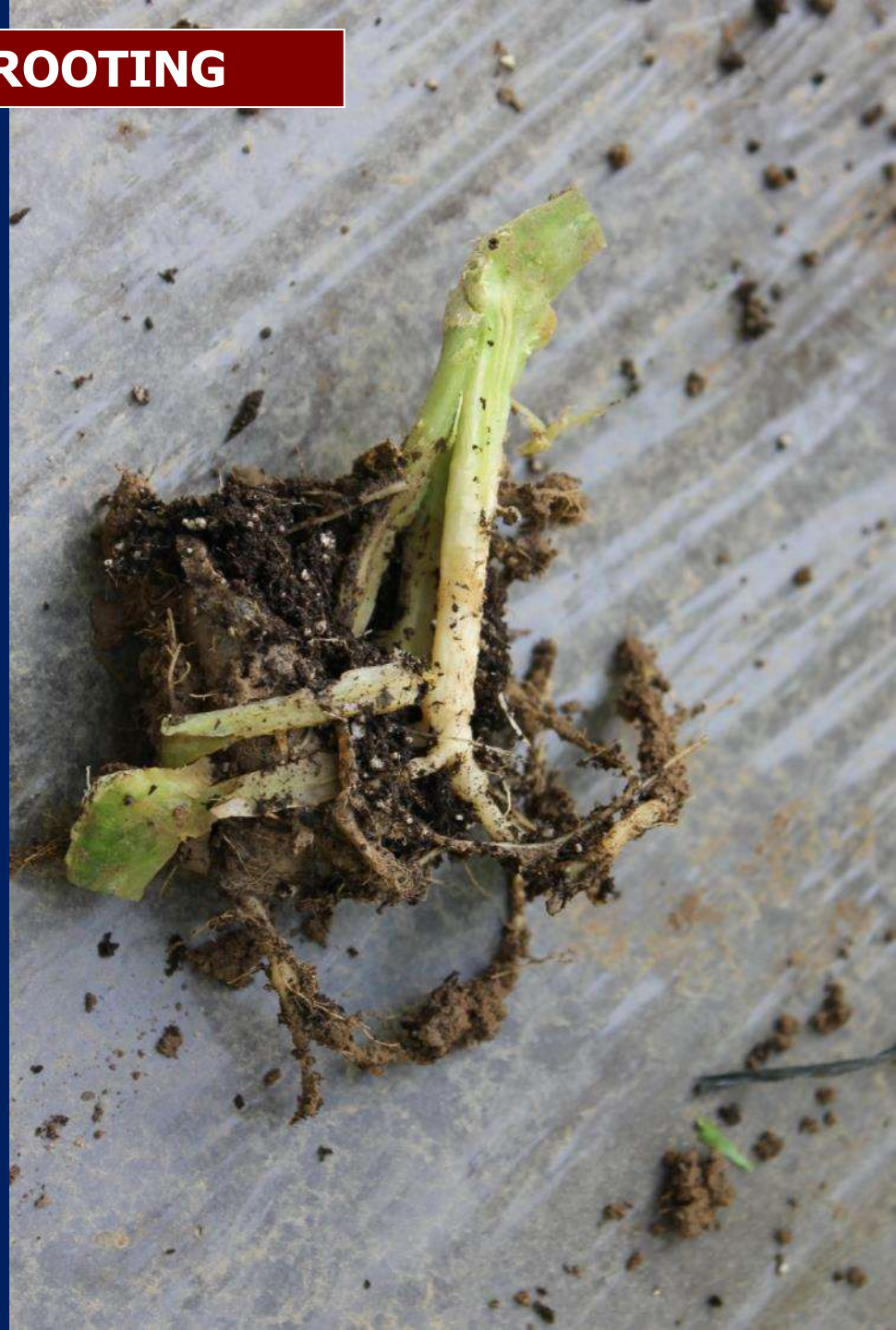
GRAFTED

COLD STRESS

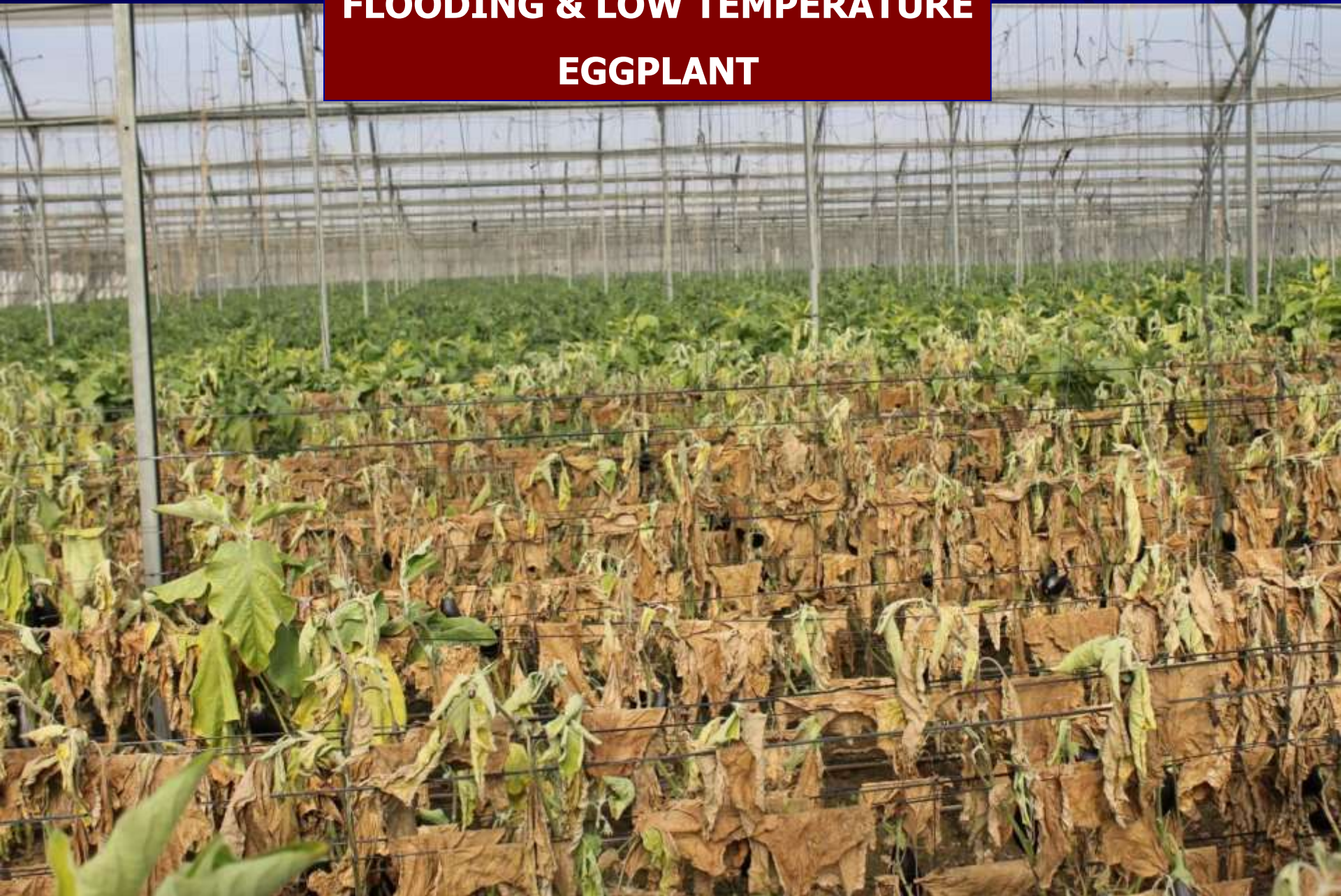


GRAFTED CUCUMBER

INTERNAL ROOTING



FLOODING & LOW TEMPERATURE EGGPLANT





NOT GRAFTED

GRAFTED



NOT GRAFTED

GRAFTED

CONCLUSIONS

THE GRAFTED VEGETABLE BECAME AN INTEGRAL PART OF VEGETABLE PRODUCTION

**ADDITIONAL ROOTSTOCKS ARE NEEDED:
DIFFERENT VARIETIES WITH HORTICULTURAL ADVANTAGES
IMPROVED RESISTANCE TO PATHOGENS**

A KEY FACTOR: HIGHER SEED QUALITY, FREE OF PATHOGENS

BETTER AGROTECHNIC SHOULD BE DEVELOPED

**NEW AND HIGHER PERFORMANCE GRAFTING ROBOTS OR NEW TECHNOLOGY MUST
BE DEVELOPED**

Thank You For Your Attention

