DISEASES OF COCONUT

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PLANTATION CROPS

- India is a major producer of plantation crops with an area of 36.41 lakh ha,
  production of 169.8 lakh MT
  productivity of 4.7 MT/ha.

- Coconut
- Cocoa
- Cashew
- Oil palm

DISEASES OF COCONUT

Mean percent disease incidence of coconut from 2008 – 2013

S. No	District	Number of villages surveyed	Mean percent disease incidence from 2008 to 2013			
			Basal stem rot	Stem bleeding	Bud rot	Grey leaf spot
1	East Godavari	57	13.82	3.49	1.93	Traces
2	West Godavari	15	11.42	4.94	2.12	Traces
3	Srikakulam	21	13.7	4.48	1.56	Traces
4	Vijayanagaram	4	7.2	11.2	1.12	Traces
5	Visakhapatnam	5	10.02	0.5	4.06	Traces
Mean		102	11.23	4.92	2.15	Traces

Various symptoms of Basal stem rot : *Ganoderma spp*

Ganoderma applanatum
Ganoderma lucidum

Various symptoms of Basal stem rot : *Ganoderma spp*

Various symptoms of Basal stem rot : *Ganoderma spp*

Intensity of Basal stem rot disease in Narsapur mandal of West Godavari District:

Village: Sitarampuram
Mandal: Narsapur
District: W. G. Dt

Soil type: Sandy soil
Cropping system: Sole coconut

Intensity of Basal stem rot disease at Dagguluru village in West Godavari District:

Village: Dagguluru
Mandal: Palakollu
District: W. G. Dt

Soil type: Black soil
Cropping system: coconut on rice bunds

MANAGEMENT STRATEGIES

- Application of recommended dose of fertilizers
- Drip or basin method of irrigation
- Frequent watering or irrigation especially during summer months.
- While irrigation, care should be taken to avoid flow of water from diseases trees to other healthy trees.
- Injury or damage to roots and pruning and cutting of the roots
- Raising and ploughing in situ of green manure crops like sunhemp and sesbania

MANAGEMENT STRATEGIES

- The disease was found to be more in lighter soils than in heavy black soils.
- During the recent years, the disease is also found in heavy soils such as black cottony soils and also on paddy field bunds.
- Sowing of indicator plants, Red gram and Bengal gram
- Red gram plants shows bark splitting symptom as the identification mark for basal stem rot disease.
- Bengal gram plants shows withering, yellowing and drying of lower set of leaves followed by upper leaves as the identification mark of basal stem rot disease or *Ganoderma* wilt disease of coconut.

MANAGEMENT STRATEGIES

- Frequent observation and detection of the disease symptom
- Uprooting and destruction of diseased and dead palms along with the roots.
- Isolation of diseased trees from healthy palms by digging isolation trenches of 1m depth and 0.5m depth.
- Application of 50g of *Trichoderma viride* in combination of 5kg of neem cake to the diseased plant as the curative measure once in every year.
- Application of the above said mixture at the rate of 1kg to all the healthy palms in the diseased garden as a prophylactic measure.
- Clean cultivation and cultural practices needs to be followed.

Application of *Trichoderma viride* and neem cake mixture to the diseased palms

INDICATOR PLANTS

Red gram

Bengal gram

MASS MULTIPLICATION AND DEMONSTRATION OF BIO CONTROL BASED INTEGRATED DISEASE MANAGEMENT PACKAGE AGAINST BASAL STEM ROT (*GANODERMA WILT*) DISEASE IN COCONUT

- Large scale demonstration of developed prophylactic and curative packages against basal stem rot disease in coconut in farmer's gardens

- 10 acre coconut gardens at two locations, Antarvedi and Kesanapalli villages of East Godavari district
- Horizontal Spread of basal stem rot disease after one year of treatment imposition at five demonstrated gardens

S.No	Name of the village	Number of diseased palms		Percent Disease Incidence	
		Aug 2012	Aug 2013	Aug 2012	Aug 2013
1	Antarvedi	244	102	38.85	14.64
2	Kesanapalli	112	70	18.66	11.66

Effect of bio control based integrated disease management package against basal stem rot disease at Antarvedi and Kesanapalli Demonstration sites

S.No	Stage of the disease development	Percentage of palms	
		At Antarvedi	At Kesanapalli
1	Palms showing completely dried symptom on the stem	62.3	37.5
2	Palms showing reduced disease spread on the stem	6.5	32.1
3	Palms showing no further disease spread on the stem	12.3	12.5
4	Palms showing increased disease spread on the stem	18.9	17.9

CDB TMOC PROJECT ON MASS MULTIPLICATION OF PARASITOIDS, PREDATORS, BIO AGENTS AND LARGE SCALE DEMONSTRATION OF BIOLOGICAL CONTROL OF MAJOR INSECT PESTS AND DISEASES OF COCONUT IN ANDHRA PRADESH

- Large scale demonstration of biological control of insect pests and diseases of coconut in farmers gardens

- 50 acre coconut gardens at five locations, Kalavacharla, G.Pedapudi and Gannavaram villages of East Godavari district and Jagati and Borivanka villages of Srikakulam district

Horizontal Spread of basal stem rot disease after one year of treatment imposition at five demonstrated gardens

S.No	Name of the village	Number of diseased palms		Percent Disease Incidence	
		Aug 2012	Aug 2013	Aug 2012	Aug 2013
1	Kalavacharla	356	369	11.86	12.30
2	Jagati	104	54	3.46	1.80
3	Borivanka	101	70	3.36	2.33
4	G.Pedapudi	55	25	1.83	0.83
5	P. Gannavaram	194	163	6.46	5.43

Linear spread of the disease after one year of treatment imposition at five demonstrated gardens

S. No	Village	Number of plants showing dried symptom in August 2013	Per cent Recovery of the plants	No of plants showing reduced disease spread or no further spread	Percentage of palms showing reduction
1	Kalavacharla	2	0.32	220	35.94
2	Jagati	58	35.15	32	19.39
3	Borivanka	37	27.40	28	20.74
4	G.Pedapudi	30	46.87	20	31.25
5	P. Gannavaram	43	14.98	38	13.24

- In biological control based IDM, application of *T.viride* need to be taken up at periodic intervals.
- The response of the palms to the treatment depended on the stage of the disease development, good agronomic practices and soil characteristics.
- The treatment was more effective when the application was carried out at earlier stages of disease development i.e. when the bleeding patches were below 50cm on the stem.
- Management depends on effectiveness of *T. viride* isolate and pathogenic virulence of *Ganoderma* isolate

Stem bleeding disease: *Thielaviopsis paradoxa*

Soil type: Sandy soil

Cropping system: Sole coconut

Coconut + bottle gourd

coconut + Ground nut

Disease severity of Stem bleeding disease in East Godavari District

Village: Munganda
Soil type: Black soil
Cropping pattern: coconut + cocoa

Village: Kothapeta
Soil type: Black soil
Cropping pattern: coconut + banana

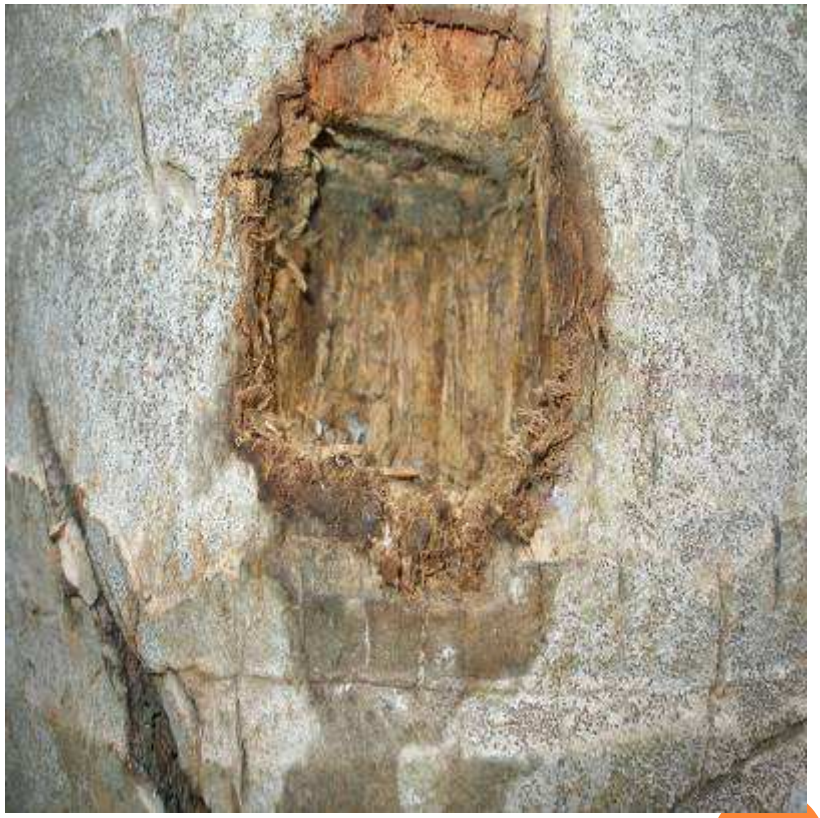
MANAGEMENT

- Avoid damage to the palms
- Apply Trichoderma viride paste on the diseased portion of the palm
- Application of 50g of *Trichoderma viride* in combination of 5kg of neem cake to the diseased palm to control the soil borne fungal spores and mycelium

Field evaluation of *Trichoderma virens* cake against stem bleeding disease in coconut

Field evaluation of *Trichoderma virens* cake against stem bleeding disease in coconut

Dried symptom of stem bleeding treated with *Trichoderma virens* cake formulation



Sporulation of *Trichoderma virens* on the palm treated with cake

BUD ROT

BUD ROT: Intensity was increased during last year because of continuous cyclones and heavy rains

MANAGEMENT

- Recommended spacing should be followed
- Provide better drainage facilities
- Trees dried due to bud rot should be removed and burnt
- Application of talc formulations of *Pseudomonas fluorescens* in crown region
- In extreme cases spraying of Copper oxy chloride 3g/lit of water

Grey leaf spot : *Pestalotiopsis palmarum*

Removal of the older 2-3 disease affected leaves and spraying the foliage with 1% Bordeaux Mixture will check the spread of the disease

LEAF ROT : *EXHEROHILUM SP.*


Coconut samples/Visaka dist.


Coconut samples/Visaka dist.
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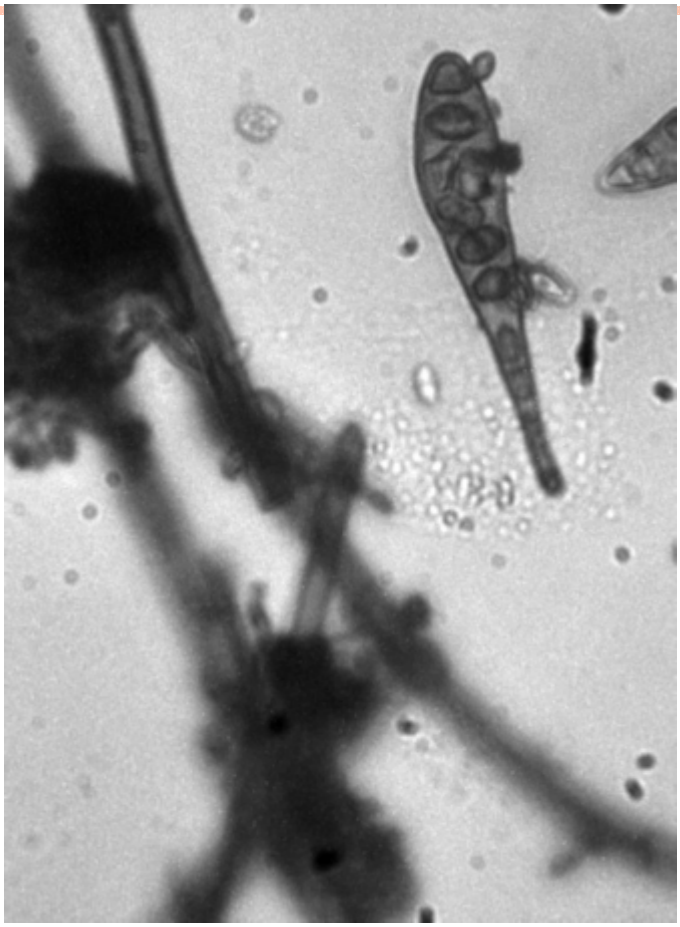

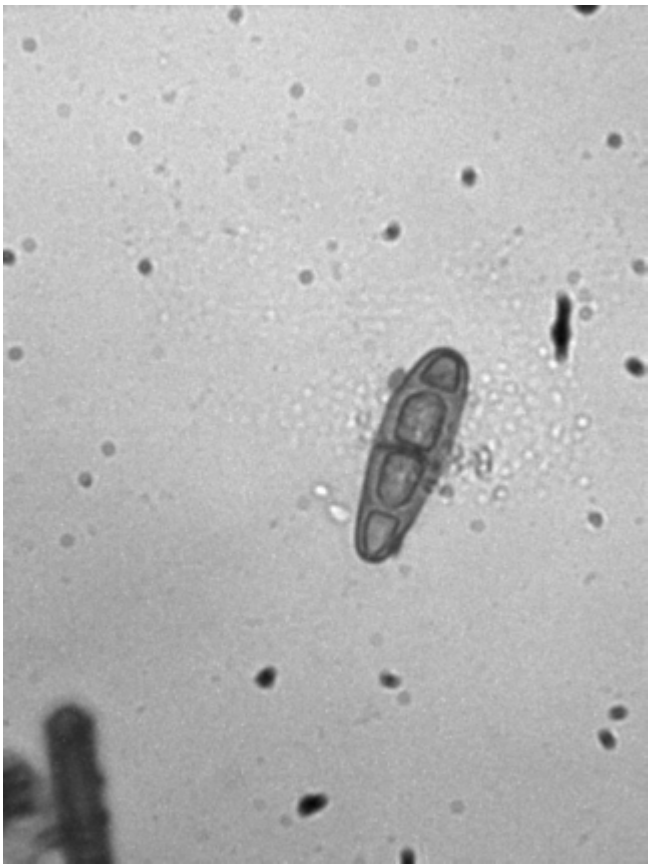

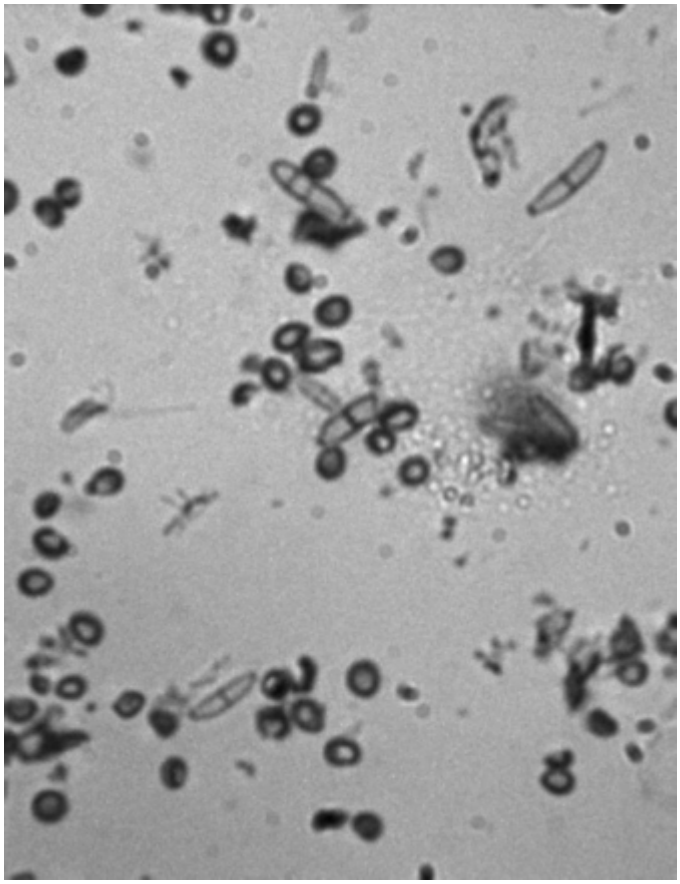

Thank You