

Farmer's Experiences on Biofumigation for Bacterial Wilt Management in Solanaceous Crops in Southern Philippines

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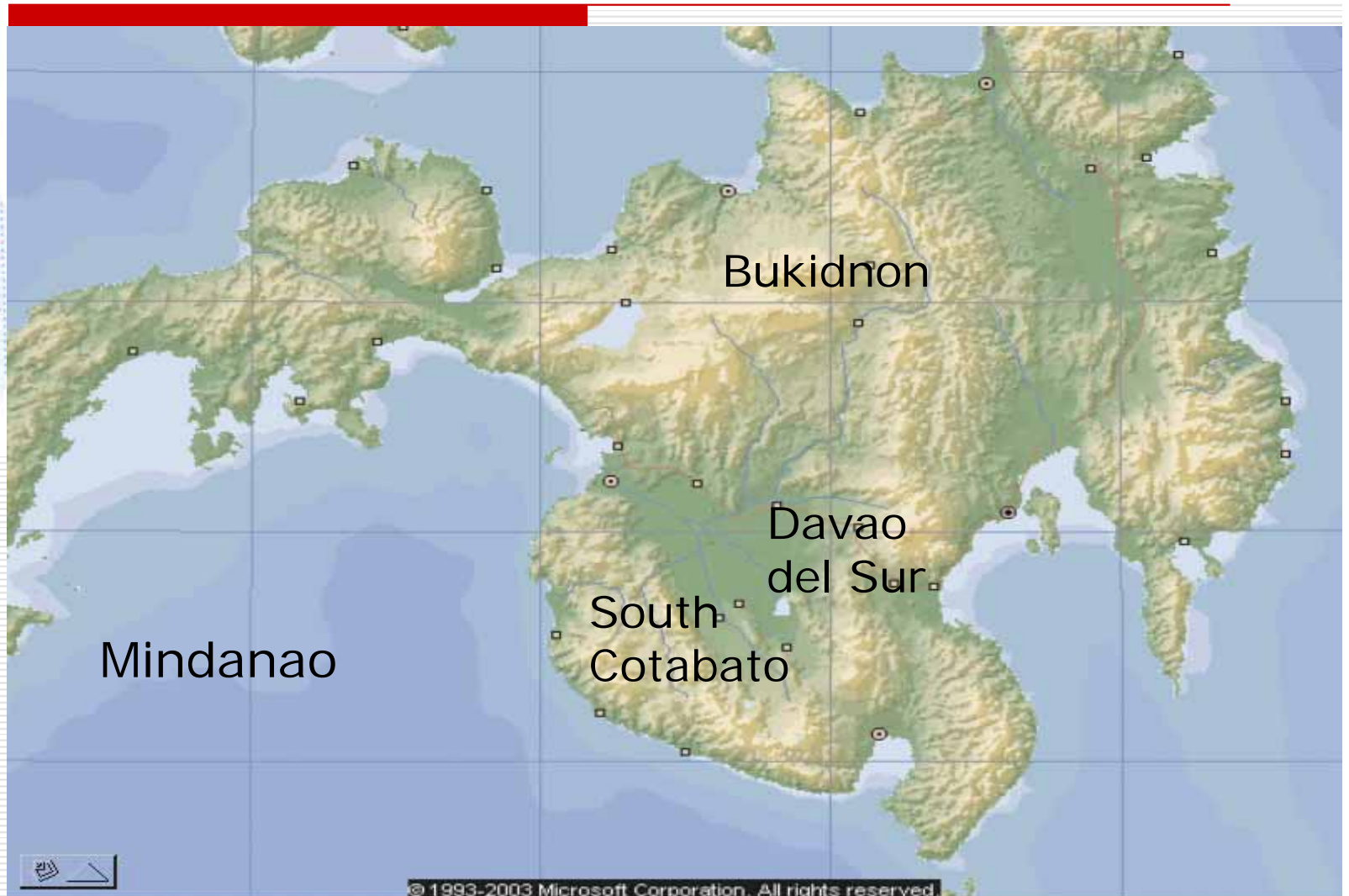


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Bacterial wilt, *Ralstonia solanacearum*

- 5-80 % crop losses in potatoes
- less % damage in tomatoes
- observed also in cucurbits



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Effect of Brassica green manure incorporation (5%w/w) on incidence (%plants infected) and yield of potatoes (tons/ha) in replicated field experiments at on-farm (OF) and experimental station (ES) sites in Mindanao (2004-2006)

Treatment	Kapatagan (OF)		Lantapan (OF)		Lantapan (OF)		Malaybalay (ES)	
	Wilt (%)	Yield (t/ha)	Wilt (%)	Yield (t/ha)	Wilt (%)	Yield (t/ha)	Wilt (%)	Yield (t/ha)
Control	48.0a	2.9c	33.7a	7.4d	29.5d	6.7d	32.5a	4.8b
Broccoli	18.0b	23.6ab	27.0bc	10.1b	57.8a	7.9cd	8.6cd	11.9a
Radish	42.1a	10.4c	19.0d	11.1b	44.3b	9.5bc	18.0b	11.3a
Cauliflower	23.9b	20.7c	30.0a	8.8c	28.9cd	11.0ab	-	-



Percent bacterial wilt, disease control and population of *Ralstonia solanacearum* as affected by biofumigation

BIOFUMIGANTS	% BW INCIDENCE	% CONTROL	POPULATION OF <i>R. solanacearum</i> [X ₀ = 4.67 x 10 ⁴ cfu/g soil]*	
			X _t	% Change [#]
Broccoli	23.53 d	39.10	2.30 b	-50.75
Cabbage	27.94 c	30.69	2.75 b	-41.11
Chinese Cabbage	34.19 b	8.69	14.60 a	+212.63
Cauliflower	14.34 e	58.82	2.75 b	- 41.11
Sunflower	26.84 c	27.93	2.80 b	- 40.04
Untreated	39.34 a	-	15.80 a	+238.33
CV	35.21 %	-	26.25 %	-

* X₀ – initial population; X_t – final population/ # (+) – increase, (-) decrease



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Researches conducted

18% Bacterial wilt incidence after radish incorporation at NOMIARC vs 32% in control plots



6% bacterial wilt incidence after radish incorporation at Kapatagan vs 30% in control plots



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Best bets

- Radish
- Broccoli
- Chinese mustard
- Cauliflower



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Brassica tissue incorporation

- Tissues chopped and incorporated manually during cultivation
- Tissues turned over during plowing



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Tissue Incorporation

- Shredded tissue incorporation
- Green manure radish plowed under with carabao-drawn implements or by hand tractor



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Participatory Action Research with farmer (Kapatagan, Davao del Sur)

- Radish green manure
- Broccoli and cauliflower wastes after harvest



Biofumigation as strategy for integrated disease management

- Clean cultivation
- Crop rotation
- Growing non-host crop e.g. Brassicas and corn
- Seed multiplication plastic bags
- Fungicide application



Farmer's concerns in biofumigation for soil-borne disease management

- Large volume of brassica tissues for incorporation
- Laborious chopping of brassicas
- Tissues inadequately broken
- Lack of irrigation facilities



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Landcare farmer

- Landcare partner incorporated radish leaves before planting clean seeds



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Landcare farmer

Invested on green manure radish, plastic mulch and water hose for irrigation and earned 5x his inputs in sweet pepper



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Future researches

- Scoping mission with ACIAR Project Leaders

ACTIVITIES

- Characterization of *Ralstonia* strains in Southern Philippines



Activities

- Test and compare different soil amendments - effects on soil physical, chemical structure and biodiversity



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Activities

- Varietal trials for resistance/tolerance to bacterial wilt (and acceptance to consumers)
- Establish best-bet clean seed



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Activities

➤ Grower education



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Thank you!

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