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## VA MYCORRHIZAL STATUS OF A COCONUT BASED HIGH DENSITY MULTI-SPECIES CROPPING SYSTEM

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A coconut based high density multi-species cropping system involving 18 component crops and three fertilizer regimes (namely, one-third, two-third and full doses of recommended fertilizers for each component crop) was laid out in 1983 at Central Plantation Crops Research Institute, Kasaragod. In 1985-86, soil samples and root samples were collected once in two months from the component crops, namely, banana, clove, coconut, coffee, pepper, pineapple and *subabul*. The objective of the study was to assess the changes in VAM status (percentage of root infection-incidence) and the extent of root colonization (infection grading) in the system with reference to season and soil fertility.

Secondary or tertiary roots were collected from all the component crops and fixed in F.A.A. These were subsequently processed according to Phillips and Hayman (1970) and observations were compiled as per Giovanetti and Mosse (1980).

Data obtained on the per cent incidence, per cent infection grading (Table 56.1), pattern of VAM infection and extent of colonization revealed that even though all the crops were grown under similar conditions of soil fertility and moisture, the pattern was distinct for each crop.

Banana, clove, pepper, pineapple and *subabul* receiving one-third dose of fertilizer showed the maximum infection grading in August, and minimum in October in banana and coffee, and also in pepper and *subabul* under one-third fertilizer regime. Banana, coconut and pepper receiving two-third fertilizer dose showed maximum infection grading in October whereas the infection grading was minimum with clove, coffee and pineapple.

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Table 56.1: VAM status in a coconut based HDMSCS at Kasaragod

	Per cent colonisation				
	April	June	August	October	December
<b>Banana</b>					
1/3 dose	60(18)	56(26)	60(42)	50(23)	66(39)
2/3 dose	73(26)	17 (7)	63(22)	70(45)	76(41)
Full dose	57(21)	70(27)	60(22)	70(35)	60(26)
<b>Clove</b>					
1/3 dose	80(31)	63(17)	68(36)	53(26)	53(29)
2/3 dose	66(23)	100(48)	66(36)	40(14)	70(32)
Full dose	57(16)	20 (4)	70(36)	40(14)	60(20)
<b>Coconut</b>					
1/3 dose	50(12)	26 (9)	40(14)	56(26)	56(21)
2/3 dose	57(22)	33(14)	26 (8)	60(26)	50(24)
Full dose	53(18)	40(15)	43(15)	40(13)	50(16)
<b>Coffee</b>					
1/3 dose	66(18)	100(40)	56(21)	43(14)	56(21)
2/3 dose	100(41)	46(18)	53(19)	43(14)	63(21)
Full dose	73(26)	40(13)	30(11)	43(16)	70(29)
<b>Pepper</b>					
1/3 dose	70(22)	76(26)	63(33)	46(13)	60(18)
2/3 dose	70(23)	53(17)	30(14)	63(23)	56(21)
Full dose	60(18)	66(26)	27(11)	56(20)	53(17)
<b>Pineapple</b>					
1/3 dose	53(17)	66(20)	60(24)	33(14)	40(11)
2/3 dose	80(31)	60(18)	76(28)	33(13)	46(18)
Full dose	100(29)	70(26)	70(22)	46(14)	56(20)
<b>Subabul</b>					
1/3 dose	63(23)	36(22)	66(35)	30(12)	66(26)
2/3 dose	80(26)	53(15)	20 (7)	30(11)	46(16)
Full dose	60(18)	76(32)	53(37)	60(19)	66(26)

Figures in parentheses indicate infection grading.

Two peaks of activity of VAM were seen in the rhizosphere of banana and pepper during June and October in the treatment with full dose of fertilizer whereas rhizosphere of coffee had peak activity in December and April. In the case of *subabul*, these peaks occurred during August to December.

Banana and pepper showed similar trends of infection grading at all the three levels of fertilizer application. When infection grading as an index of mycorrhizal activity was considered, pepper and coffee grown with one-third dose of fertilizer application supported the maximum activity, whereas for banana, clove, coconut and pineapple two-third dose was found to influence maximum activity. In addition, coffee alone had similar values in one-third and two-third doses of fertilizer. In the case of *subabul*, maximum mycorrhizal activity was seen in the treatment with full dose of fertilizer. However, coconut harboured maximum activity in both one-third and two-third doses of fertilizer.

It is generally known that mycorrhizal activity increases up to an optimum level of fertilizer application and gradually decreases thereafter.

Concentration of nutrients in the host tissue also decides the VAM species colonizing the plant and its extent. Thus, the dose of fertilizer applied has a direct bearing on the mycorrhizal activity and this may vary with host-fungus combinations.

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