

## REFERENCES

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Table 1. Farmers' cropping patterns in which Indigo is included as a green manure, 1981, 1986, 1987, 1988.

PANGASINAN/LA UNION	ILOCOS SUR	ILOCOS NORTE
Rice-mungbean + Indigo***	Rice-Onion- Tobacco + Indigo***	Rice-Garlic- Corn + Indigo**
Rice-Corn + Indigo*	Rice-Garlic- Tobacco + Indigo***	Rice-Onion- Corn + Indigo**
Rice-Tobacco + Indigo*		Rice-Garlic- Mung + Indigo*
Rice-Peanut + Indigo**		Rice-Onion- Mung + Indigo*
Rice-Rice-Mungbean + Indigo*		Rice-Garlic- Tobacco + Indigo***
		Rice-Onion- Tobacco + Indigo***

\* Rare

\*\* Common

\*\*\* Most common

Table 2. Grain yield of maize and mungbeans when grown either as monocrops, or intercropped or relay cropped with Indigofera tinctoria. IRRI, 1989 dry season. (Data source: Pye Tin and Garrity, unpublished).

CROP COMBINATION	GRAIN YIELD (T/HA)	INDIGO DRY BIOMASS (T/HA)
Monocrop maize	2.32	
Monocrop indigo		6.20
Maize + indigo:		
Intercrop	2.64	2.66
Relay <sup>1/</sup>	2.50	1.64
Monocrop mungbeans	0.81	
Mung + indigo:		
Intercrop	0.60	6.28
Relay <sup>1/</sup>	0.80	4.68

<sup>1/</sup>Indigo seeded at maize or mungbeans hilling-up.

Table 3. Grain yields of wheat when grown as a monocrop or when intercropped or relay-cropped with Indigofera tinctoria. IRRI, 1989 dry season. (Data source: Mann and Garrity, unpublished.)

CROP COMBINATION	GRAIN YIELD (T/HA)	INDIGO DRY BIOMASS <sup>1/</sup> (T/HA)	INDIGO N ACCUMULATION (KG/HA)
Monocrop wheat	2.62		
Monocrop indigo		10.88	
Wheat + indigo:			
1:1 row arrangement	2.38	6.42	
3:1 row arrangement	2.73	6.02	
Broadcast	2.58	6.04	
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Difference	ns	**	*

<sup>1/</sup>Indigo density at 50 plants m<sup>-2</sup>

Table 4. Fertilizer amounts applied (kg/ha) by rice farmers with without indigo cultivation, 1987.

NUTRIENT	PANGASINAN/ LA UNION		ILOCOS SUR		ILOCOS NORTE	
	With Indigo	Without Indigo	With Indigo	Without Indigo	With Indigo	Without Indigo
N	44.50	136.25	24.25	85.75	49.88	101.50
P <sub>2</sub> O <sub>5</sub>	10.00	43.00	1.75	5.50	3.69	6.50
K <sub>2</sub> O	0.00	14.00	1.75	5.50	3.06	6.25

Table 5. Farm size, yield ranges, mean yield and rice varieties with indigo and without indigo cultivation in the survey areas, 1987.

	PANGASINAN/ LA UNION	ILOCOS SUR	ILOCOS NORTE
Farm size (ha) (ranges)	0.5-3.00	0.50-5.0	0.1-3.0
Yield range (kg/ha)			
With Indigo	3000-7500	3120-7000	2880-7000
Without Indigo	2500-6000	3000-6500	2400-6500
Mean Yield (kg/ha)			
With Indigo	4735	4235	4854
Without Indigo	4520	3943	4606
Varieties planted			
	IR42	IR36	IR36
	IR48	IR42	IR42
	IR64	IR64	IR48
		C1	IR64

Table 6. N accumulation of indigo under several growing conditions, IRRI Farm, 1987.

GREEN MANURE	N ACCUMULATION (t ha <sup>-1</sup> )		
	Clippings (120 days)	Regrowth (58 days)	Total
Indigo alone	145	123	267
Indigo + cowpea (indeterminate)	101	96	197
Indigo + cowpea (determinate)	104	113	217
Indigo + mung	99	101	200
Indigo + maize			84
Weedy fallow	-	-	118
S.E.	17.5	13.5	22.6
C.V.	19%	15%	19%

Table 7. Effect of indigo green manure in different intercrop conditions on the grain and above-ground dry matter yields of IR64, IRRI, 1987.

GREEN MANURE	RICE GRAIN YIELD (T/HA)			RICE ABOVE GROUND TDM (T/HA)		
	0 N	30 N	Mean	0 N	30 N	Mean
Indigo alone	3.53	3.75	3.64	8.94	9.39	9.17
Indigo + cowpea (indeterminate)	3.82	3.87	3.84	9.05	9.53	9.29
Indigo + cowpea (determinate)	3.72	3.62	3.67	8.80	8.52	8.66
Indigo + mung	4.15	4.13	4.14	10.13	10.43	10.28
Maize/Indigo <sup>1/</sup>	4.26	4.13	4.19	10.07	10.20	10.13
Weedy fallow	3.16	3.59	3.38	7.38	9.47	8.43
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Mean	3.56	3.83	3.70	8.66	9.48	9.04
SE(a) among 2 cropping main plot means		0.3797			0.837	
SE(b) among 2 N level mean		0.1654			0.383	
SE(1) among 2 subplot means in the same mainplot		0.4680			1.084	
SE(2) among 2 means in the same or different main- plot/subplot						
C.V. (a)		17.76%			16.04%	
C.V. (b)		19.48%			14.67%	

<sup>1/</sup>Indigo relayed into maize at hilling-up.



Table 8. Age of indigo biomass at incorporation and the labor required for plowing and transplanting operations in the survey area, 1987.

	PANGASINAN/ LA UNION	ILOCOS SUR	ILOCOS NORTE
Age of Indigo (days)	210-250	120-160	120-160
Plowing (mandays/ha)			
With Indigo	8	8	8
Without Indigo	8	10	10
Transplanting (mandays/ha)			
With Indigo	10-12	10-12	10-12
Without Indigo	8-10	8-10	8-10

Table 9. Height, plant population, and fresh biomass production of *Indigofera* sampled in farmers fields, northwestern Luzon, June-July 1989.

FIELD. NO.	PROVINCE	AVE. HT. (CM)	PLANTS/M <sup>2</sup>	FRESH BIOMASS (T/HA)
06	Ilocos Norte	85	259	9.88
08	Ilocos Norte	97	109	10.75
10	Ilocos Norte	105	228	13.25
11	Ilocos Norte	70	292	6.13
13	Ilocos Norte	79	172	7.81
15	Ilocos Norte	90	29	5.19
17	Ilocos Norte	89	195	8.83
18	Ilocos Norte	91	370	12.38
20	Ilocos Norte	122	98	19.06
01	Ilocos Sur	79	207	7.55
02	Ilocos Sur	86	259	10.25
04	Ilocos Sur	70	95	5.38
39	Ilocos Sur	115	49	8.03
40	Ilocos Sur	83	41	5.38
41	Ilocos Sur	88	57	5.10
42	Ilocos Sur	89	52	6.23
43	Ilocos Sur	79	47	4.53
44	Ilocos Sur	71	74	4.25
47	Ilocos Sur	90	122	6.13
37	La Union	107	120	11.50
24	Pangasinan	106	215	17.50
25	Pangasinan	101	122	16.69
27	Pangasinan	89	109	11.06
29	Pangasinan	100	116	14.42
31	Pangasinan	100	82	10.63
33	Pangasinan	100	144	12.95
35	Pangasinan	113	333	16.31
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Grand Mean		91	147	9.80
Minimum		57	29	4.25
Maximum		121	37	19.06
Means by province:				
		AVE. PLT. DENSITY	PLANT DENSITY	FRESH BMS
	Ilocos Norte	92	20	10.54
	Ilocos Sur	83	10	6.17
	La Union/Pangasinan	102	16	13.88

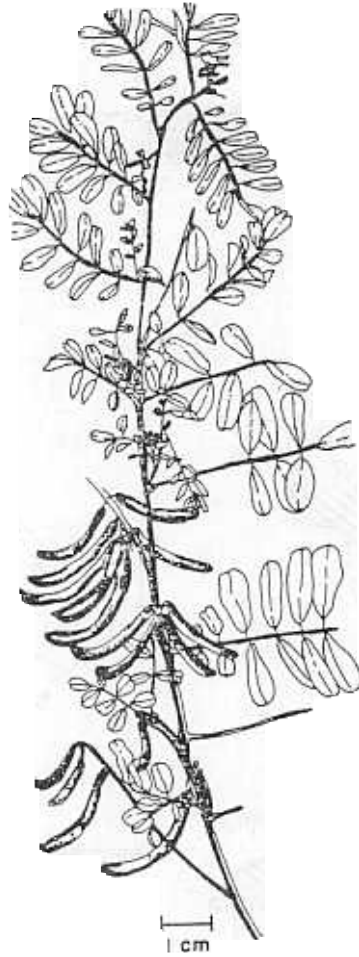


Fig. *Indigofera tinctoria* L.

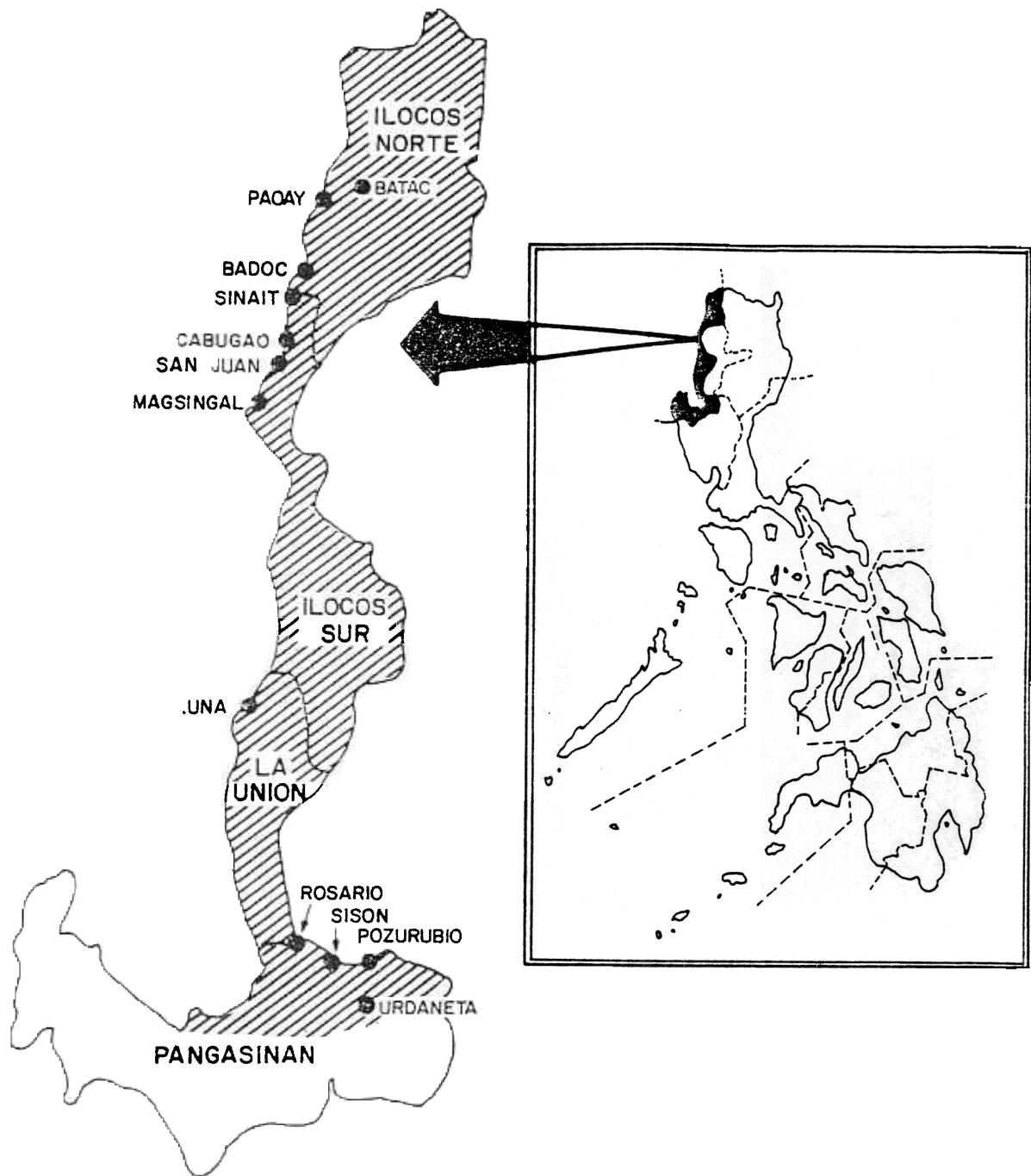


Figure 2. Major production zone of Indigofera in northwestern Luzon, Philippines, and localities included in the farm-level surveys.

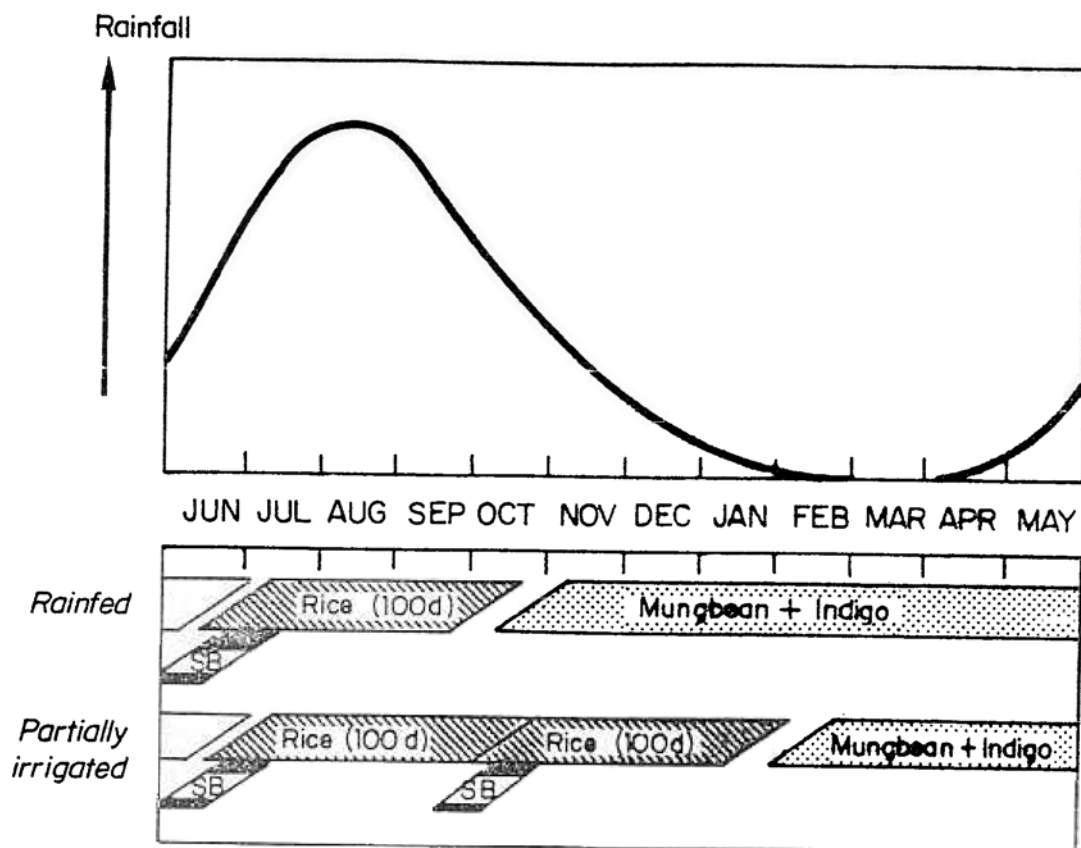


Fig. 3. Typical cropping pattern using *Indigofera tinctoria* L. green manure in relation to rainfall.