

CHAPTER 2

A seven-year study of individual variation in fruit production in tropical



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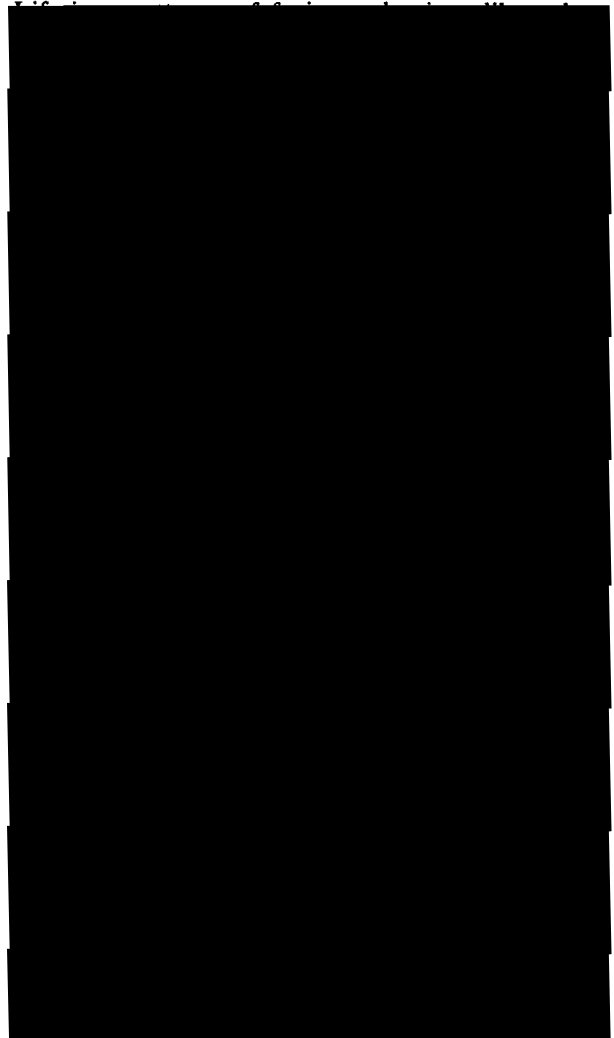


Keywords: Lauraceae; seed dispersal; frugivory; tropics; masting; phenology; plant reproduction; annual variation in fruit production

Abstract. Fruit crop sizes varied from year to year

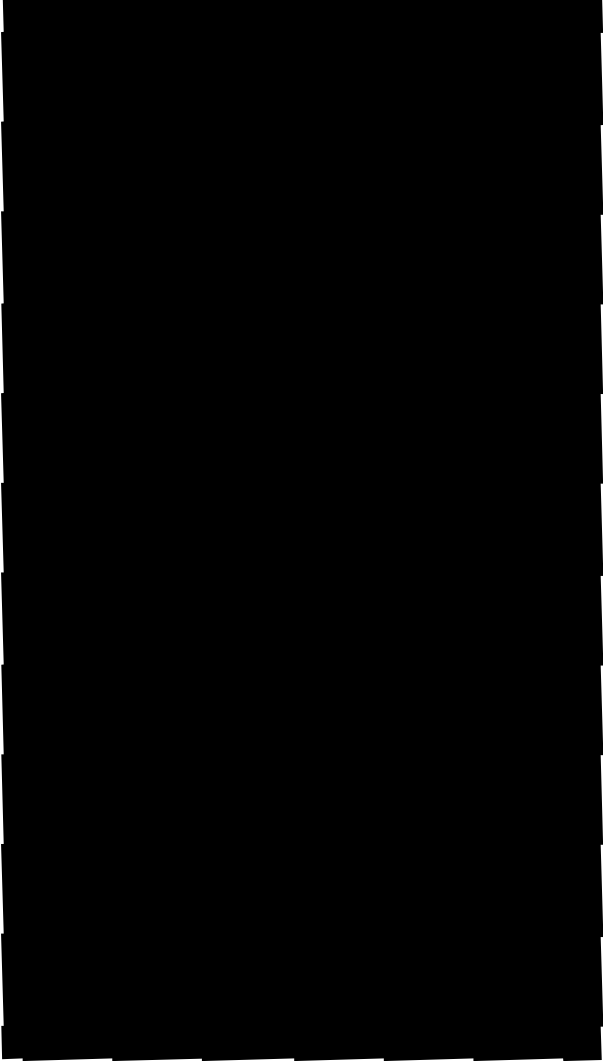


Introduction.



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behavior of seed dispersal (T... W...)



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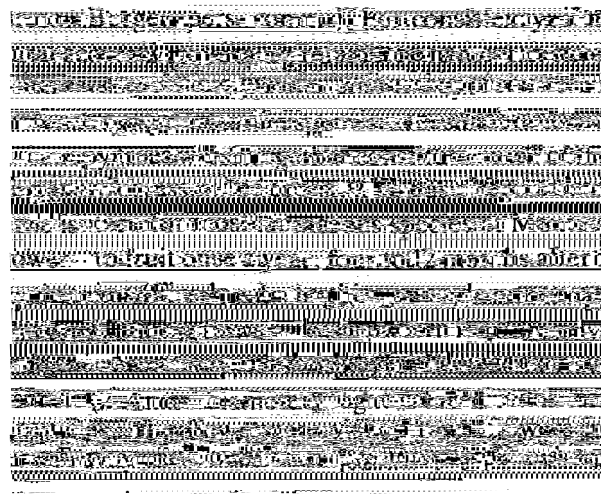
Study area

The study area covers 15 km² of lower montane wet
and rain forests (H... 1963) at Monteverde,
Puntarenas, Costa Rica (10° 15' N, 84° 48' W).



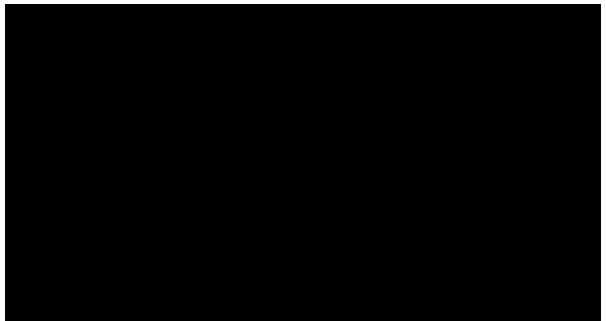
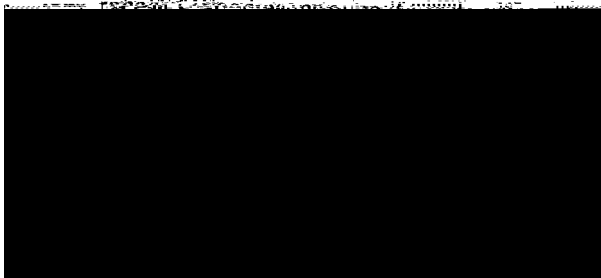
Species list

At least 22 bird-dispersed lauraceous tree species
occur in the same or adjoining habitats at Mon-
teverde. Their taxonomy is still being resolved (W...





wasps. In any month of the year, at least one lau-



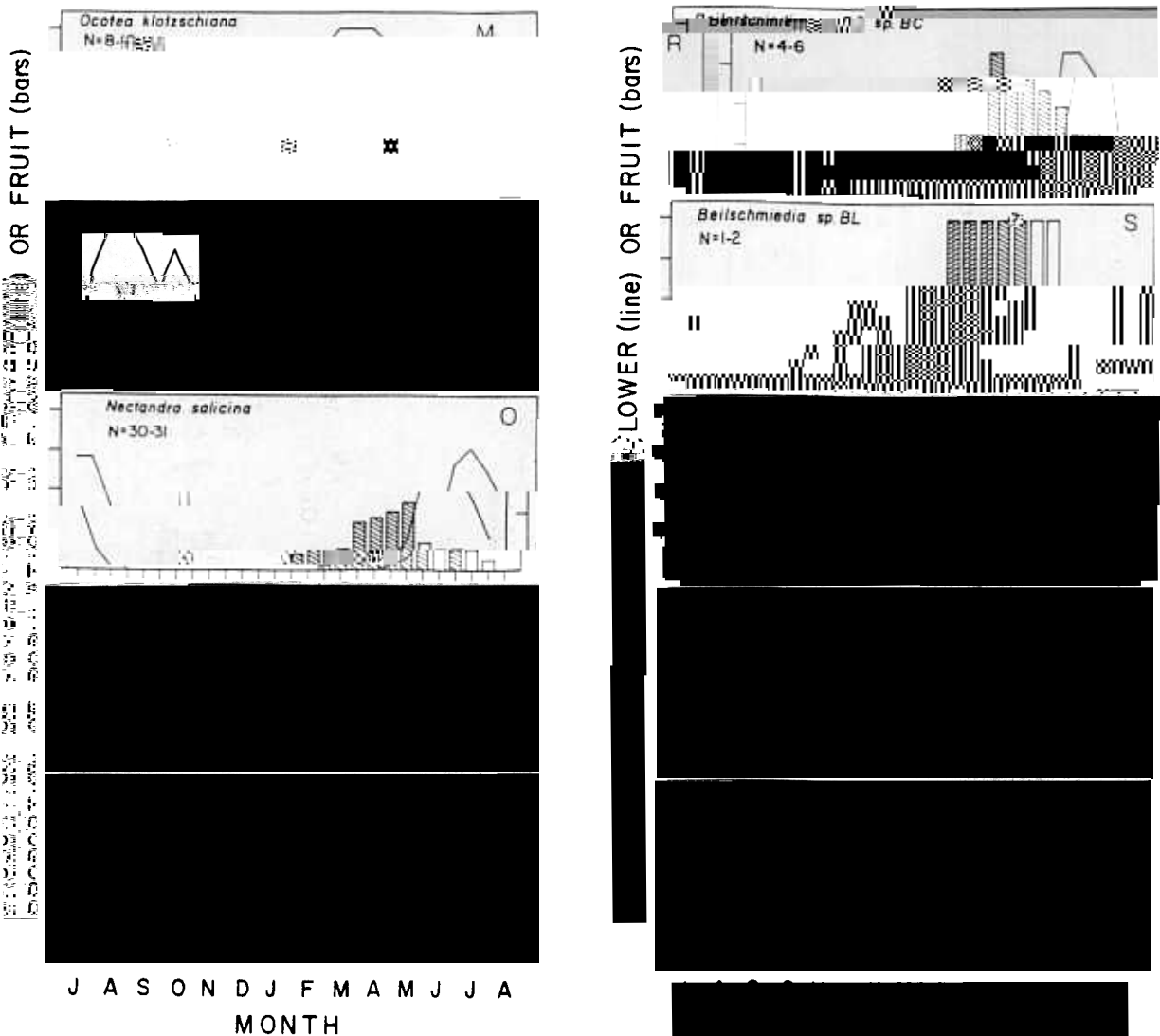


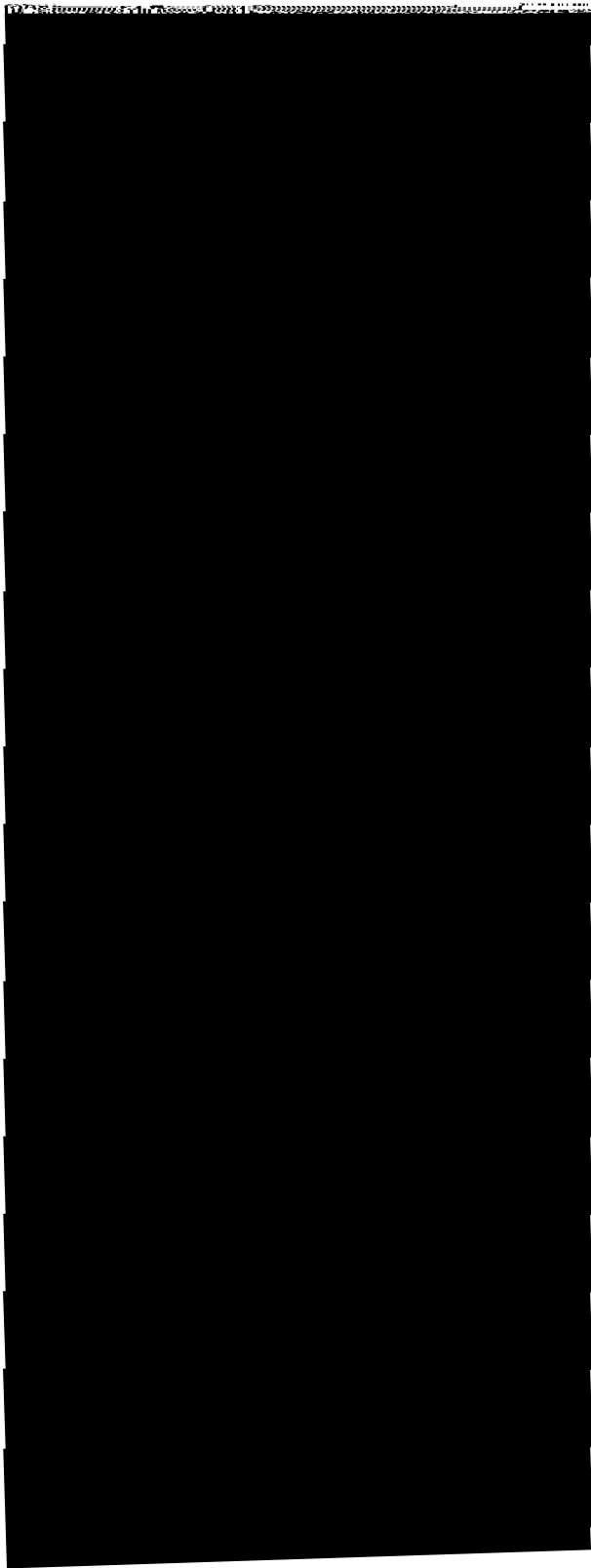
Fig. 1a-v. Seasonal flowering and fruiting phenologies of 22 bird-dispersed tree species in the Lauraceae of Monteverde, Costa Rica in

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Lauraceae, quantity of reproduction in the
 forest reproduction in Since June 1980 and month

286 marked trees, representing 22 species. Individ-



Results

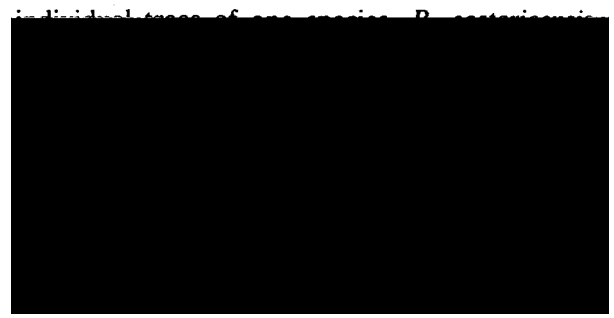
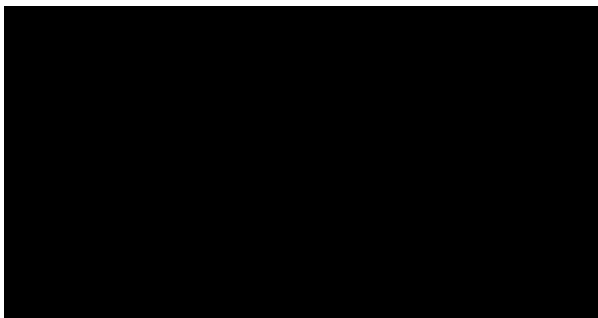
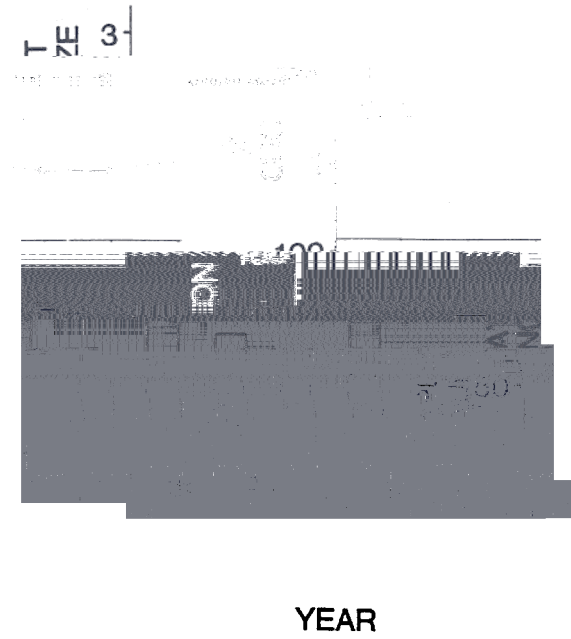
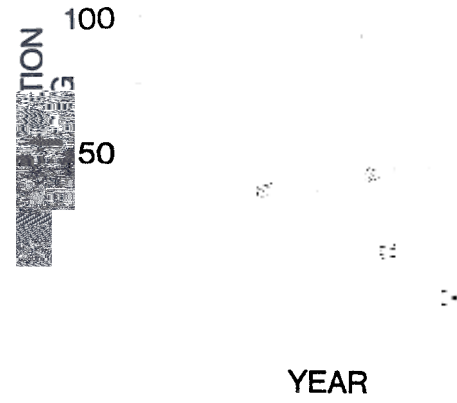
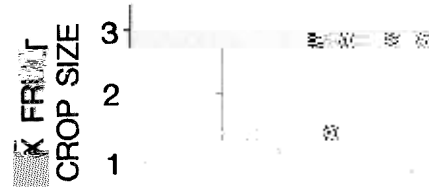
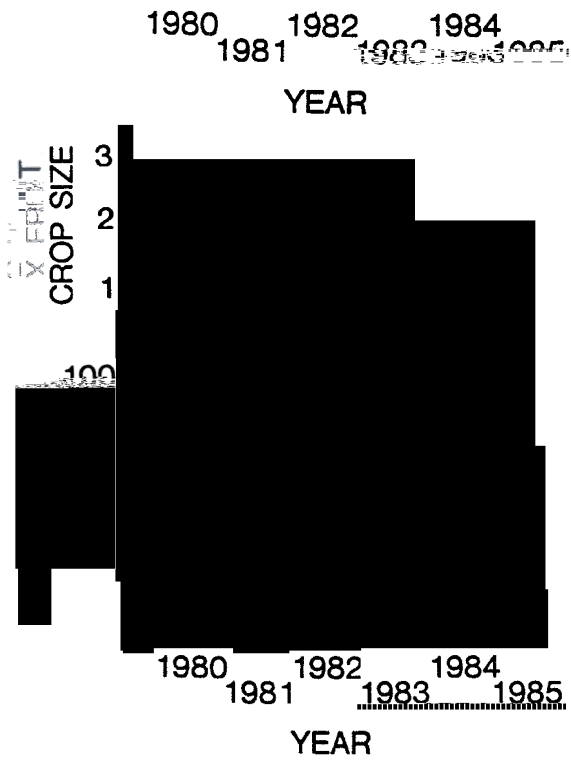
Production fluctuated annually. (Fig. 2, Fig. 3)

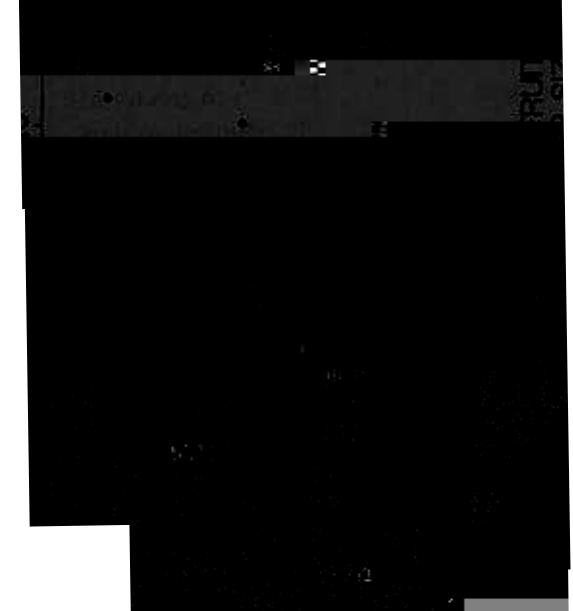
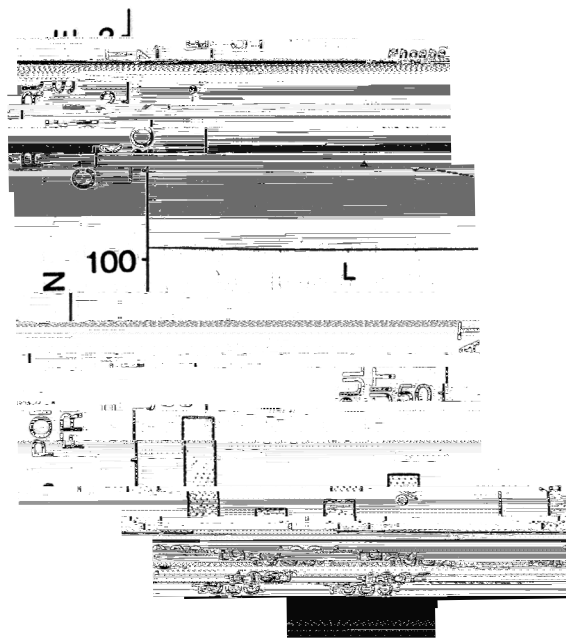
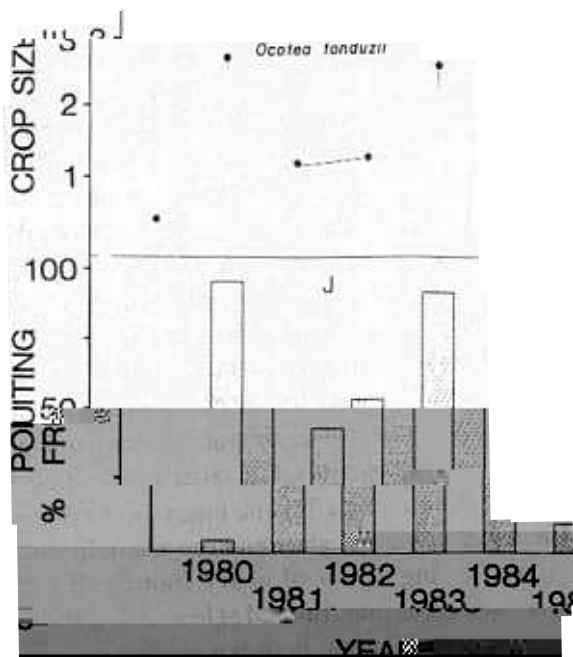
Beilschmiedia sp. BC

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other, yet they showed distinct cycles (Table 1).

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*Previous reproductive efforts and variation in fruit
production in *Senecio jacobina* Weier*



ship between fruit production in a given year and



There appear to be three general reproductive pat-

terns within the genus *Quercus* in the moderate level

of production. One group of species is characterized

by a high degree of variability in fruit production

from year to year. A second group is characterized

by a high degree of variability in vegetative growth

from year to year. A third group is characterized

by a high degree of variability in both fruit production

Tree species	Correlation coefficient: fruit vs. vegetative growth	No. successive plant-years	Correlation coefficient: fruiting vs. vegetative growth	No. successive plant-years	No. trees
	-.22	21	-.33	27	6
	-.44*	42	-.56	55	12
	-.07	24	.00	31	7
	.00	102		135	30
	.05	104		135	29
	-.43	21		27	6
	.58**	56		73	16
	-.28	7		24	5
	-.07	20		27	6
	.13	39		52	12
	-.42**	110		142	30
	-.18	34		49	12
	.41	12		15	3
	.23*	85		113	25
	-.03	39		56	14

* P < .01
 P < .05

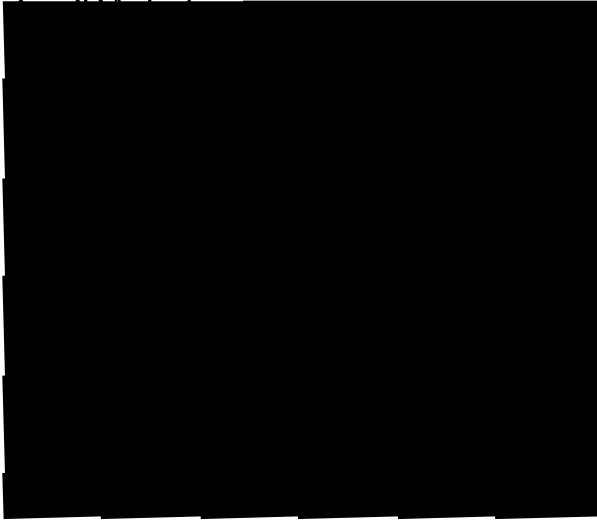


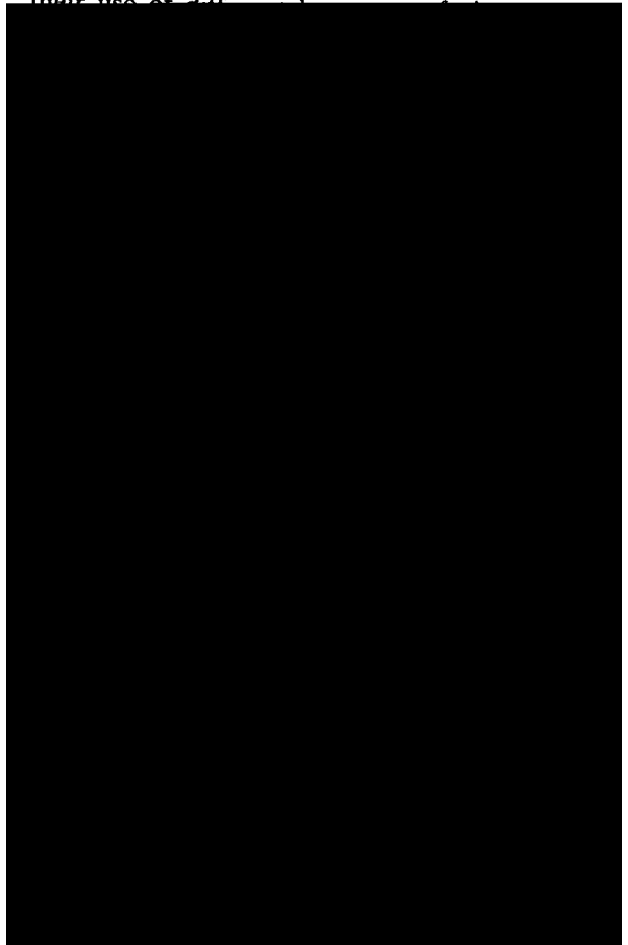
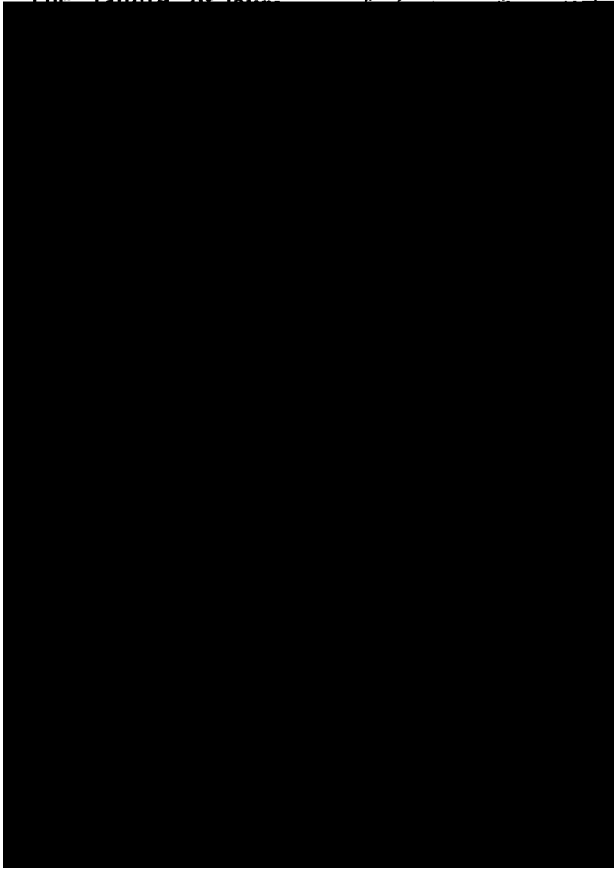
Table 3. Three general patterns of fruit production within the Lauraceae at Monteverde. Mean crop size and variability in crop size refer

Tree species	Fruit size (g)	Mean fruit crop size	Variability in crop size	Consistency of individuals
Erratic moderate level fruiterers				
<i>Phoebe mexicana</i>			moderate	
<i>Ph. neurophylla</i>			moderate	
<i>Nectandra gentlei</i>			high	
* <i>Persea sp. RP</i>			moderate	
<i>Ocotea sp. FL</i>			moderate	
** <i>N. sp. NC</i>				

Importance of lawrencei for S. ...

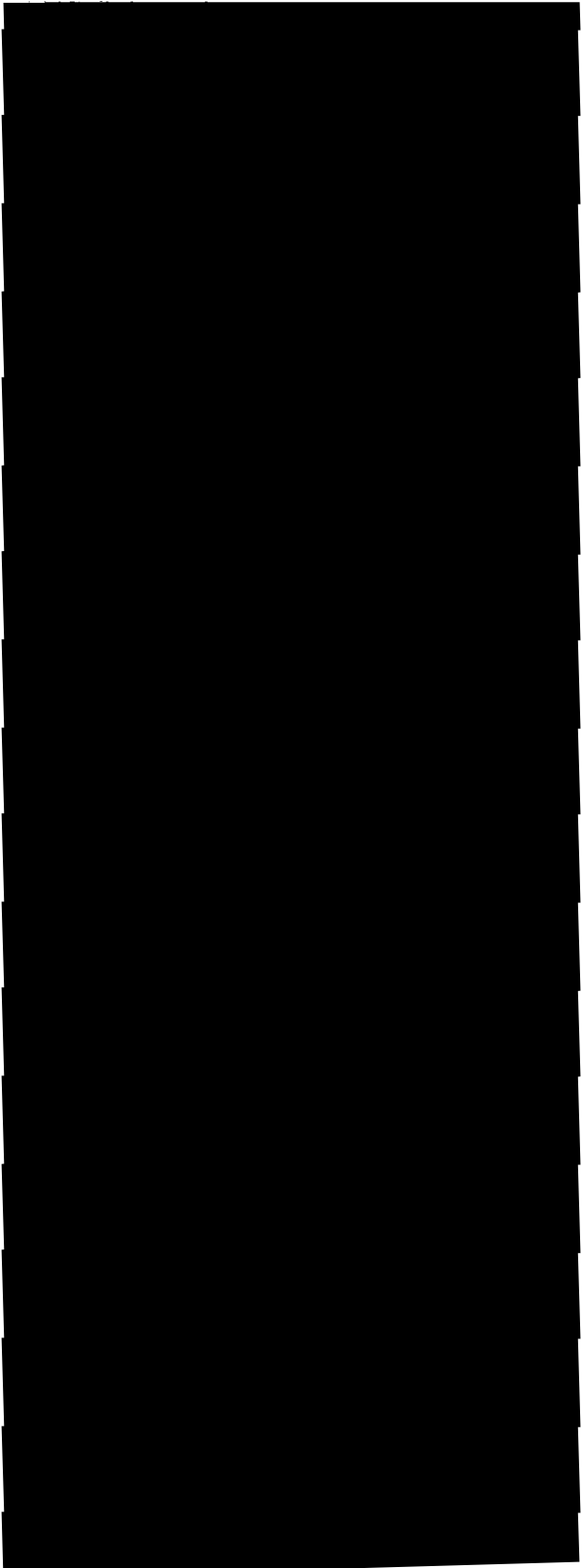
their use of diff ...

The 'failure' of lawrencei for S. ...

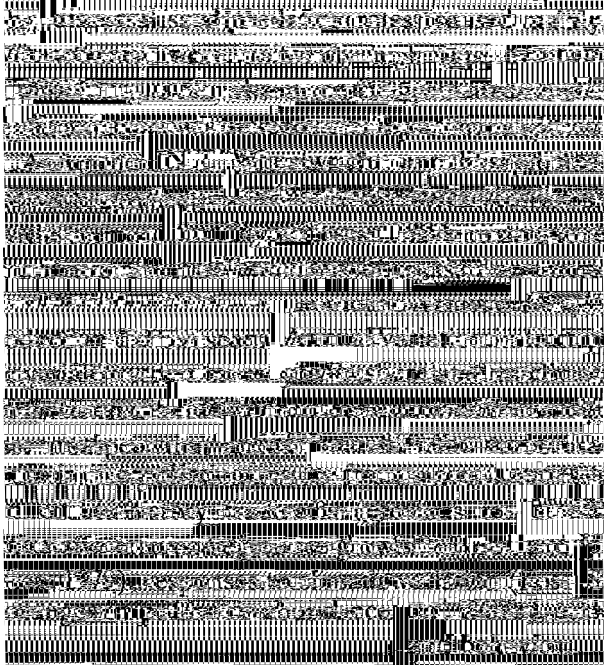


<i>B. costaricensis</i>	3.9	2.0	0	0	
<i>N. sp. NC</i>	0.5	3.3	0	2.0	
	0	0.2	0	0	
	0	0	0	0	
	1.1	0	72.6	0	
	1.1	0	0	0	
	2.2	5.8	0	2.0	
	0	0.1	0	2.4	
	91.2	59.7	27.4	56.9	

Procnias seems related to their dependence on lau-
raceous fruits (Snow, 1973; see also Crome, 1975).

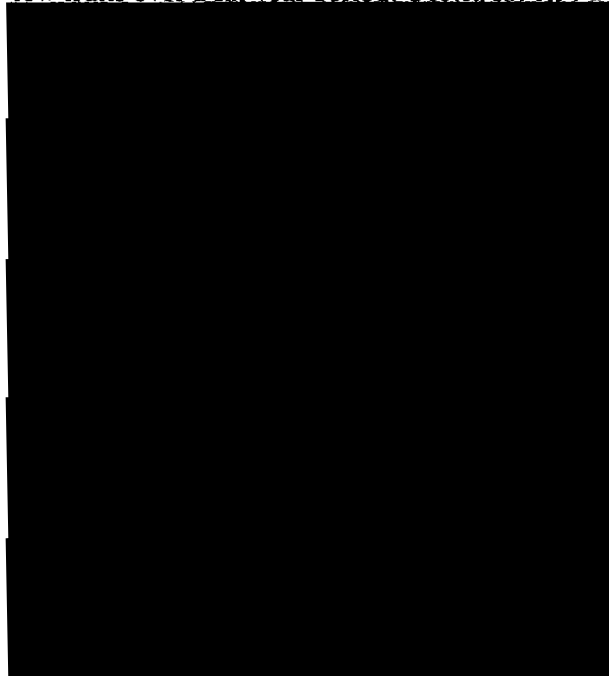


vere among the erratic and periodic fruiterers (Table 3), and rather low in most species of consistent, low-level fruiterers (although it is not obvious whether this is cause or effect of phenology). Post-

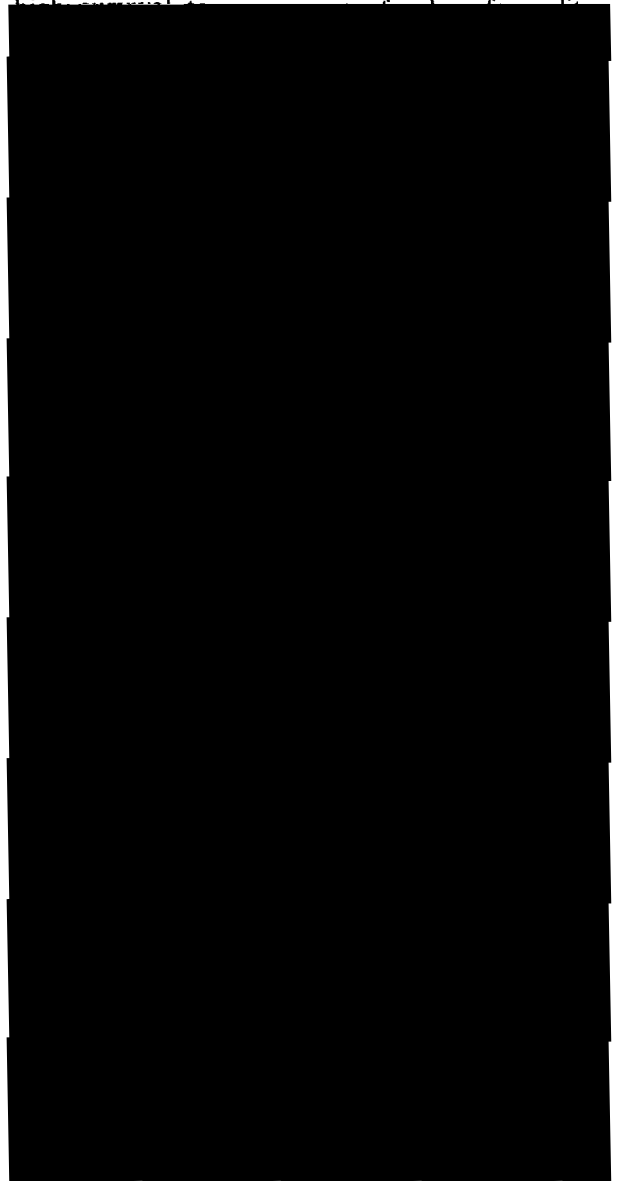


Variance in reproductive success among trees

Several species in this study produced perplexingly few fruits over a six-year period. *Ocotea sp. RP*, a

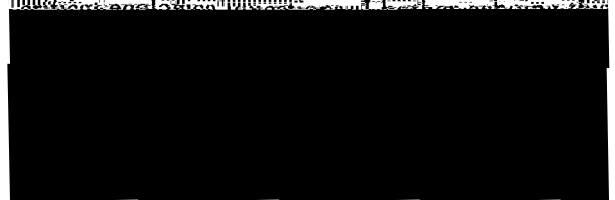


their seed or seedling biology suggests unusually high survival to



Conclusion

It is common place to note that, with long term studies of marked individuals to provide answers to



Alvim, P. de T. and R. Alvim. 1978. Relation of climate to

growth of eucalyptus in temperate zone. *Forest Science* 24: 1-10.

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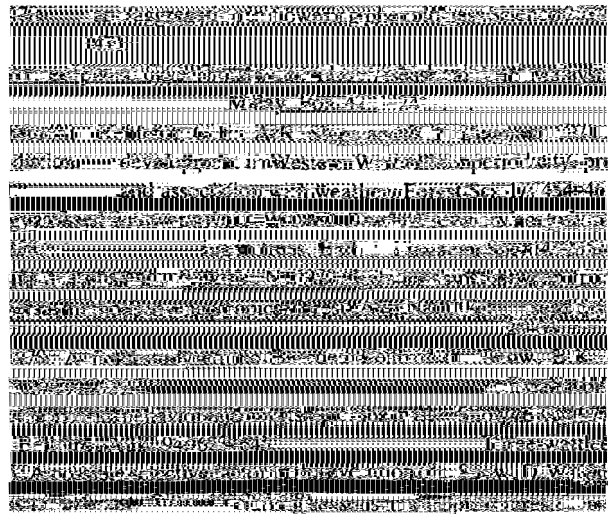
Acknowledgements

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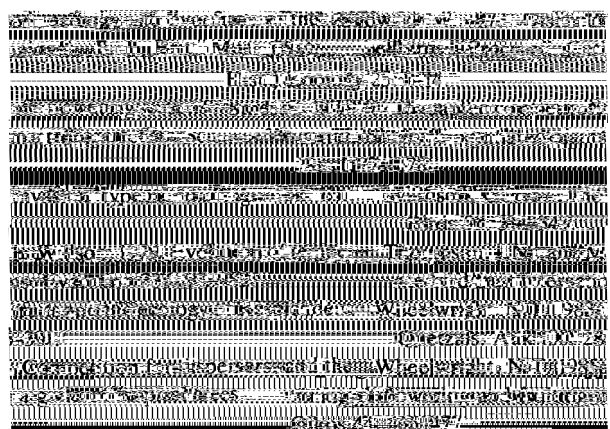
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and randomness in the distribution of flowers. *Ecology* 60: 100-108.



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