

FRUIT PRODUCTION

Introduction

Fruit production is influenced by such factors as weather, soil type, and cover type, and may affect fruit predator populations. To assist in looking at these relationships, we are censusing fruit production of thirteen common fleshy-fruited species found on 20 subquadrats throughout the forest. This census method indicates peak and trough years of these species, but does not quantify finer scale patterns.

Site Selection and Layout

The twenty sample subquadrats are paired: ten of the sites are in the managed half of the forest, and ten are in the control half. Sites are paired based on cover type and overall appearance. The selection of subquadrats from each of the cut blocks in the managed half of the forest is based on homogeneous cover and understory. Sites of similar cover and understory type are selected from the control part of the study area. No sites are located in the 5J block because of its irregular terrain.

Each 25x25m subquad contains five 25m transects running east-west. The beginning location of each transect is randomly selected from within each of the five 5m segments constituting the north-south line of the subquad (see Table 3–15 for locations of these transects). The transect is marked by nylon string which is held down at either end by an orange plastic or wooden stake and a tall pink flag. The flag and stake are marked with the subquad code and the distance of the transect from the northern edge of the subquad.

Fruit Sampling Period

The species being sampled for fruits are: *Maianthemum canadense*, *Medeola virginiana*, *Rubus allegheniensis*, *Rubus flagellaris*, *Rubus hispidus*, *Rubus idaeus*, *Ilex verticillata*, *Aralia nudicaulis*, *Cornus canadensis*, *Gaylussacia baccata*, *Vaccinium angustifolium*, *Mitchella repens*, and *Viburnum acerifolium*.

Fruits are counted three times during the season.

- In the first census, fruits of *Aralia nudicaulis* are counted during the first week of July, just before many have become ripe.
- In the second census, fruits of *Maianthemum canadense*, *Cornus canadensis*, *Gaylussacia baccata* and *Vaccinium angustifolium* are counted during the second half of July. The

fruits of *Maianthemum canadense*, *Gaylussacia baccata*, and possibly *Mitchella repens* are usually still green but mostly developed. Virtually all fruits of these species that are green at this time reach maturity. Also at this time, presence of flowers on remaining species is noted to facilitate locating their fruits in the third census.

- The third census, conducted at the end of August, should capture the *Rubus* species, *Ilex verticillata*, *Medeola virginiana*, *Viburnum acerifolium*, and possibly *Mitchella repens* if it wasn't fruiting in July.

Procedure

1. Print out the data sheets for each subquadrat. Each data sheet has starting points in meters for transects in that subquadrat (Figure 3–28). Print or photocopy a map of the study area with subquadrat fruit production transect lines, and plan a route (Figure 3–29).
2. At each subquad, start at the northernmost or southernmost transect, census the length of it, and come back censusing the next transect, until all transects have been censused in a weaving fashion.
3. Do the census by slowly walking along the string, scanning vegetation within a meter on either side for fruit. Tally the fruits using a dot-dash tally in the column indicating whether the fruit is north or south of the transect string. For some species with numerous fruits, a hand counter may be helpful. At the end of the transect, summarize the tally and write in the number. A height stick with a meter mark on it helps determine if a borderline fruit is within a meter of the string.
4. Every third year, ceptometer readings are taken to measure photosynthetically active radiation along the transects. Readings are taken at three permanent sampling points on each transect, at 30cm above the ground (see Table 3–15). These points were randomly selected the first year from each of the 0–8m, 9–16m, and 17–25m segments of the transect.

Equipment

Clipboard	Data sheets
Pencils	Hand counter
Map	Height stick
Ceptometer	

Evaluation

This method was adapted from a master's thesis project conducted at HRF by Andrew Whitman and represents a continuation of his three years of data collection. Changes to his methods include standardizing the search area to a 2m-wide strip and dropping uncommon fruiting species from the study.

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Table 3-15. Sample locations of fruit production transects and ceptometer sampling points along transects.

Subquadrat	Transect (dist. from n. edge of subquadrat)	Ceptometer sampling points (distance from west end of transect)		
	(m)	(m)	(m)	(m)
3E31	1	3	16	17
	9	6	16	24
	11	6	12	21
	20	2	16	21
	22	5	16	20
3G23	3	11	21	
	9	8	12	21
	14	1	12	23
	20	5	10	22
	22	8	12	20
3J41	5	3	13	23
	8	1	10	23
	12	1	11	20
	17	6	14	17
	21	4	15	24
4F41	1	5	9	24
	6	6	12	18
	11	1	12	24
	19	3	14	20
	23	2	13	23
4G31	2	2	15	17
	7	3	12	22
	11	6	9	20
	19	7	16	19
	25	5	15	17
4G41	5	1	13	22
	10	3	11	19
	13	2	12	19
	19	6	11	18
	23	2	11	22
4I43	1	4	14	20
	10	8	13	24
	15	2	16	20
	20	6	16	24
	22	6	9	24
5E41	2	1	12	20
	6	8	14	20
	14	5	15	20
	17	1	13	20
	21	8	13	19

Figure 3-28. Fruit production transects subquad data sheet.

HOLT RESEARCH FOREST
FRUIT PRODUCTION TRANSECTS
SUBQUAD DATA SHEET

Year 92 Observer JWW Weather clear warm

SUBQUAD 4F41			NUMBER OF FRUIT										Total	
Transect Location			1m		6m		11m		19m		23m			
Species	SP#	Date	N	S	N	S	N	S	N	S	N	S		
<i>Maianthemum canadense</i>	327	16 JUL	129	90	46	85	2	19	0	0	0	4		
<i>Medeola virginiana</i>	328	1 SEP	NP	→										0
<i>Rubus allegheniensis</i>	571	1 SEP	NP	→										0
<i>Rubus flagellaris</i>	576	"	P-0	P-0			34	31	34	62	16	10		
<i>Rubus hispidus</i>	577	"					14	12	14	12	0	0		
<i>Rubus idaeus</i>	580	"							3 ⁺	6 ⁺	16	P		
<i>Ilex verticillata</i>	639	"					P-0	P-0			NP	NP	0	
<i>Aralia nudicaulis</i>	710	16 JUL	0	0	0	0	0	0	0	0	0	0		
<i>Cornus canadensis</i>	727	16 JUL	0	0	0	0	0	0	0	0	0	0		
<i>Gaylussacia baccata</i>	747	16 JUL	0	0	0	0	53	52	0	0	0	0		
<i>Vaccinium angustifolium</i>	756	16 JUL	0	8	19	11	38	23	12	88	85	40		
<i>Mitchella repens</i>	851	1 SEP	NP	→										0
<i>Viburnum acerifolium</i>	860	1 SEP	NP	→										0

Figure 3-29. Map of fruit production transects.

