



Hunt Institute for Botanical Documentation
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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

Parrilla E. Santander
Abril, 1969

Secretaría de Recursos Naturales

SERVICIO COOPERATIVO DE DESARROLLO RURAL

Adiestramiento en Fruticultura

1969

Abril	21 - 26	Región N° 1 y 2
Agosto	4 - 9	Región N° 3
Octubre	6 - 11	Región N° 2 y 4

CENTRO ADIESTRAMIENTO

Centro Nacional de Agricultura y Ganadería

Comayagua, D.D.

BANDERAS DE CENTROAMERICA



GUATEMALA



EL SALVADOR



HONDURAS



NICARAGUA



COSTA RICA

40
PAGINAS

Cuaderno de Cursillo Fruticultura
DESARROLLO Abril 1969
Perteneciente a Patricio E. Sotomayor

FINCA DESARROLAL:

3,200 Mangueras, con irrigación
cerca del río

Superficie: 400. Hacia Pinal

purpose of farm: { (1) cattle production
(2) plantas mejoradas
(3) experimentación

3 types cattle: Brahman,

Santa Prataclis, Chaloley

A, B, C. → prices for bulls:

\$ 700; 750; 550 sold

at farm for cash or

loan through Banco

Comercio (5 years to pay)

hembras: \$ 800; 650; 500

Pollos: \$ 1.50 each (DESARROLAL
pays transport)

Unico lugar para comprar cerdos:

Dirección General de Agri y

Ganadería, Tiquisigalpa, D.F.

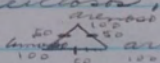
Libros para conseguir:

- ① El Arte de Cíes e dejetas
Frutales por el Dr. Agr.
 Alonso P. Grünberg (septa
 edición); Editorial "El Ateneo"
 Buenos Aires, Auto es
 prof. Titulo de Entomología
 y Director del Inst. de Fruti-
 er Facultad de Agronomía y
 Veterinaria de Buenos Aires
 Copyright: Hecho el depósito
 que previene la ley 11.723
 talleres Gráficos J. Mayo. Bell,
 Campesinato 553, Buenos
 Aires

- ② Avicultura Lucrativa
 por Roberto Shopflocher
 Editor: Cosmopolita, Calle
 Tucumán 413 o Marhué,
 Casilla de Correo 1514
 Copyrighted by Editorial
 Marhué; Buenos Aires

Factores importantes:
 luz; clima; suelo;

1) clima: → temperatura
 → precipitación pluvial
 → altitud → fotoperiodismo (long
 (time light is on land
 — sun and shade) →
 humedad relativa

(2) suelos: — textura,
 [como arcillosos, limosos,
 arenosos] 

estructura

drainaje (afecta

las plantas mucho — puede
 causar una enfermedad
 de hongos como asco-
 goni: agnantes por ejemplo
 necesita buen drenaje.)

materia orgánica

(aumentado por medio
 de fertilizantes naturales, etc.
 x about 40 in this group.

profundidad $\rightarrow$ ¿dónde
empieza? ¿vea madre?
etc., etc. $\rightarrow$ afecta las raíces
(5 pies de profundidad
está bien - o mas)

3. Mercados

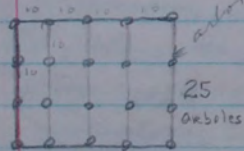
- preferencias del
consumidor - tipos
comerciales
- accesibilidad
al mercado
(transporte, etc.)

Establecimiento del huerto frutal

- selección de terrenos
- " tipos de frutales

a. sistema de siembra

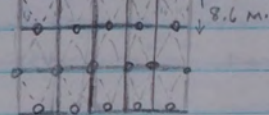
(1)



(10 por 10 metros distancia cada m)

- al cuadrado
- al trebolillo
- curvas a nivel
y terrazas

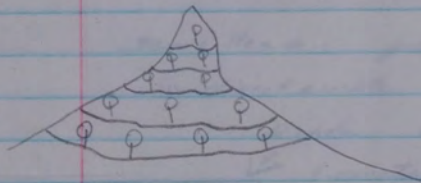
(2) (10 x 10 m.)



27 árboles
en cuadro de
40 x 40 metros)

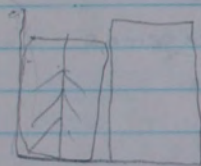
" Se puede sembrar mas
palos en sistema trebolillo "

- para terrenos con
pendientes



Cultivos intercalados:
sembrarlos a una
distancia de 1 metro por
el surco.

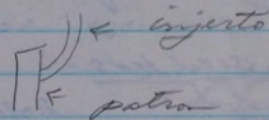
- (a) alones verde: las
plantas leguminosas
- (1) cowpea (2) fuyol tancinelo
 - (3) jack bean (4) sandalwood



Semilleros y Viveros

- (1) Compra a viveros comerciales
- (2) Producción en la finca

semillero → donde se va a
poner la semilla para
injetar (el patrón) para
vivero →

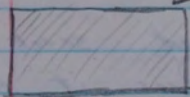


semillero: para germinar

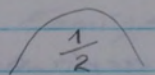
- (1) directamente en la tierra

Medida a sembrar:

1 metro by 1 metro



ó cajones de madera



arena
aserrín



ó tierra



materia
orgánica
(compost)

Que clases de semilla usan
en el semillero - el patio
- use planta cuolla

- los
más
usados
- (a) naranja agria
(para tener pronto)
 - (b) mandarina (C. latifolia)
 - (c) Limón Ponderoso
(trigo de río; arenoso)
 - (d) Naranja 'biga'
 - (e) Naranja trifoliata
(para estar fría)

In seed beds:

	Entre Surcos	Entre Plantas
Cítricos:	4"	chorro convido
Aguacates:	6"	chorro "
Mangos:		

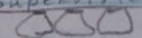
Plant well washed seed
- if sugar adheres it attracts
insects - dry in the shade

Preparation of seed to plant:

 $\frac{1}{2}$ " (aguacate)
cut off $\frac{1}{2}$ " of
hard + plant in seedbed

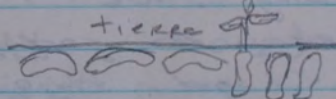
Regla de Sembrar: poner la
semillas 3 ó 4 veces mas
profundo que tamaño de
semilla

por ejemplo: ① aguacate

Supervisión de tierra


(the cut seed should
be almost at the surface
of soil)

② mangos

tierra 

Fertilizar soil before
planting: bromuro de metilo
(gas in 1 lb. cans) →
kills all other seed in soil as
well as insects

Preparing the soil: 11 onzas
de Aldrin mixed into
soil of seedbed to prevent
insects (prepare soil
by insecticide + fumigation
1 week before putting

down seed

Transplant seedlings when
reach 4" to 6" size

to 'vivero':

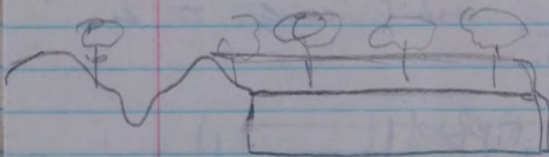
If seedlings are weak +
yellowing: use 1 onza de
Nitrota de ^{línea} gachinas mezclada
con 1 gal. H₂O y
poner alrededor de árbol

Viveros:

- (a) directamente en la
terreña
(b) en bolsas de polietileno
9"x12" ORANGES ó 10"x14" ^{MANOS}
Y AGUACATE
Distancias entre viveros:

entre surcos → 24" - 36"

entre plantas - 18" - 24"



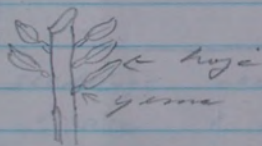
1 Cuchamita (1/4 onza) de
Fertilizante para cada
planta

Propagación de frutales

- a) por semilla
- b) asexual/ó vegetativa
 - (1) estaca
 - (2) acodo
 - (3) injerto

Injertación:

One can graft branches
size of pencil into the
'patrón'. (8 month
plants are ready to be
grafted)



to graft:

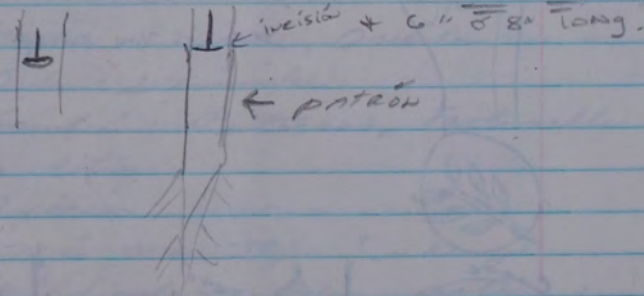
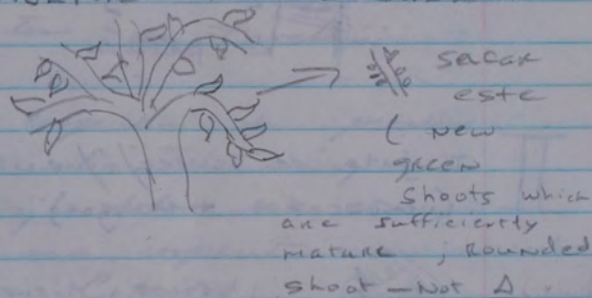


Leave 'yemas'

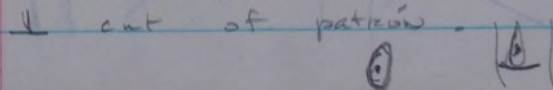
Tipos de injertos:

- I
- (1) T ó Escudete: cítricos
 - (2) Vencer ó Enchapado
(aguacate y mangos)

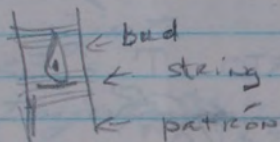
INJERTO T ó ESCUDETE



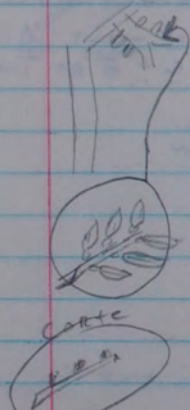
cut off bud + put in



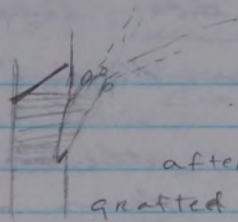
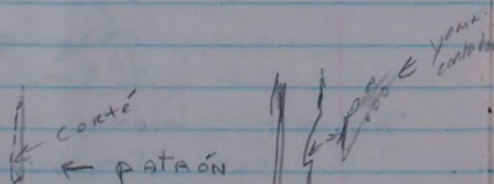
tie bud in place around
patron with special
string : cinta de .0035
mm para amarrar injertos



II Injerto de veneer/ó/ en chapalo (avocados + mangos)



yemas tienen que
ser un poco seson



after yema is
grafted cut Father
stock off 1 cm. (2.54")
above new branching

Costos de Producción:

* cooperativa de producción
comprando tierras y
trabajándolo es común
y una cooperativa de mercados
Citrícos:

origen: medio Oriente

Orden: ~~Geraniales~~

Familia: Rutaceae, ~~Faboideae~~
y Citrus

Especies:

más común tipo: "naranja
trifoliada" → buen pato
en lugares de frío

Distancia de Sembrar:
cuando ya están grandes:

Limon y Limones 15' - 20'
Naranjas y Mandarinas 20' - 25'
Toronjas 30' - 35'

Fertilizaciones

1-5 años

K para Nitrógeno Total

		1 ^o AÑO	2 ^o AÑO	3 ^o AÑO
N	libra	1/2 lb.	1 1/2 lb.	3
4	1-5	Abul 10 3/4 lb.	13 1/4	3 1/2
4	7-5	Mayo 15 1 lb.	2	4
6	6-6	Julio 10 1 1/4 lb.	2 1/2	4 1/2
	Agosto 15 ^o	1 1/2 lb.	3	5

total 5 lb. 10 3/4 lb. 20 lb.

Fertilización árboles en Producción
Formula

0.4 lbs. de N por cada árbol
por cada 100 lbs. de fruta
producida

0.2 lbs. fosforo (P₂O₅)

0.4 lbs. de Potasio

TORONJAS

0.3 N

0.2 P

0.3 K

Cultivo de mangos

Origen de India, Indo-China,
Islas Filipinas

Mangos son miles de variedades

- se puede sembrar en
tierra pedregosa

Hay 3 variedades

- se necesita buen drenaje
y no se sembla de
semilla. Se planta 25' - 50'
entre árboles y se
cultiva en el terreno
alrededor de cada árbol
1-2 metros - para riego

Los cochinos abundan
entre años. Se tiene

buenas variedades mejores
para su sitio. Es una
cosa de herencia

* patón puede ser muy criollo
* hay yemas mejores se cosecha
en Zamorano

Utilización:

Se puede conservar enteros
en bolsas polifénicas de
nitrógeno; en marmeladeras;
y preservados enteros; ante
de fruta fresca

Important in marketing: Plant
types acceptable for your
market. Hayden (greenish purple)
larger y C.E.O.V. + yellowish
for in-country selling.

Cultivo del Aguacate (Persea americana)

Se necesita buen drenaje
y suelo plano y amenso

3 Razas Aguacates (según
altitud + clima)

- (1-1500 m de altitud)
- (1) Antillanos (0° de latitud
Occidentales)
 - (2) Guatemaltecos (800-1800 m)
 - (3) Mexicanos (1500 → m)

- Ⓐ Los 2 primeros tipos maduran
6-8 meses después de
floración
- Ⓑ Los Mexicanos maduran
10-11 meses después de
floración

Casacas: Distintivas:

- Ⓐ Antillanos: gruesa y suave
- Ⓑ Guatemaltecos: " y durapapa
- Ⓒ Mexicanos: " y suave
con olor de anise

Tipos comerciales:

- ① Antillanos: Simmons,
Pollock, Waldin, Catalina,
Blue nose, Hotbird
- ② Guatemaltecos: Ross, Nabal
- ③ Mexicanos: Fuerte, Duke
- ④ Ant.-Gut.: Loth-7,
Loth-8, Lula, Half,
Choquette, Simmons

6.5-7.5 ph 7 in suelo
para aguaceros

Distancia de siembra
25 x 40 pies
30' x 30'

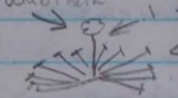
Formulas para fertilización:

(N) (P) (K) (Mg)

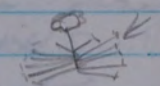
- ① 4-9-3 - 1.5
- ② 4-5-5 - 1.5
- ③ 5-10-5 - 2

Polinización:

Avocado flower Grupo A:

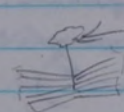
①. ^{ambiente}  1 flor femenina
Abril 24 12 flores masculina

se abren las flores a las
9-10 AM

②. ^{están abiertas} 
Abril 25 12-1pm.

Grupo B

①. 
Abril 24
están abiertas
9-10 AM

②. 
abierta
Abril 25
12-1pm.

(9-11am) (9-1pm) (930-1pm)
Grupo A - Waldin, Lula, Simmons
(9-12am) (8-12am)
Grupo B - Fuerte, Pollock,
(8-11am)
McDonald

Siempre tiene que
sembrar mezcla de Grupo A y B

para tratar el viréa
- solamente el aguacate
es comúnmente así.

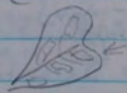
Enfermedades Plantas

I fisiológicas

II parasitarias

- ① "Deficiencia de magnesio" ocurre
muchas veces en
mangos & aguacates"
- (un sustituto
será sal inglesa - vale
60-80¢ lb en farmacias)

un síntoma será
descoloración de hojas de
plantas (amarilladas) y



las venas verdes

- ② Todos los árboles necesitan
metal de cera - un
poco pero siempre necesitan
se ve esta deficiencia
en las hojas - parecen
como loncos



- ③ Falta de manganeso (se ^{corrige}
PH 7 ↑ 6 ^{tal vez} ^{farmacia})

los árboles no reciben
mucho agua.

Por ejemplo: 3 lbs. manganeso } para
2 años } 4 lbs. Kal } aviso
100 gal. agua

- ④ Necesidad de hierro
(4-8 onzas cada árbol
cada año) → 2 veces al año

- ⑤ Necesidad de Cobre
síntomas bolsa de goma
alrededor de semilla, terminación
de palas de secano,
ramas torcidas, hojas
absolutamente gruesas &
grandes

formula: 2 libra con
100 gal. H_2O
cada arbol 2 veces el año.

- ⑥ Falta de Nitrógeno:
(quemando destruye
nitrógeno)
producen muy pocas
frutas; no tienen
buen gusto, se ven tan
yellowish

Remedio: Urea fertilizante

- ⑦ Falta de Potasio:
opositoma - frutas
pequeñas y no buen
gusto, en naranjas
cascara muy leopdo

Remedio: ponerle
K puro

* Cuando hay demasiado
K cascara es muy
gusosa en las naranjas

- ⑧ Falta de fósforo -
muy raro en Honduras.

- ⑨ Falta de Molibdeno
similómus: goma sobre
hojas, manchas amarilladas

- ⑩ Exceso de BORO
- se quita con agua
- durante 4-5 meses
regar sin los arboles

ENFERMEDAD PARASITARIAS

- ① (las de organismos vivos)
- hongos, bacterias, virus.

"Muchos virus atacan las
raíces."

- ② ("Hongos afecta mas a
floricultura")

A veces tiene que
sacar arbol con todos
sus raíces porque
se puede afectar los
de mas.



GOMOSIS: se vea
en el tronco - se
cansadas por hongos
o vea tambien en
las ramas en el anti
remedio: escava toda
la rama afectada y
corta parte afectada
y pongo mezcla de
colu, agua, kal en el
herido.

Citruos - Melanosis
síntomas: manchas redondas - color
 café o gris - surti liso
remedio: Corta ramas
secas y aplica
cobre (colu - kal - agua
formula). Se condicio
es critica para
tratamiento 2 veces -
2nda. aplicacion despues
de 21 dias

Anthracnosis de Limón
el pasto de los nuevos
limones son negros. y ^{las flores} ~~floracion~~
Usa cobre - cada 10 dias
hasta que termine.

(Mildew) **MANGOS:**

① **Cerise** - enfermedad de mangos
(mildew) - las flores se cubren
con un polvo gris -
y se negran

remedio: Azufre mojado 4 kg.
en 200 litros H₂O

② **antrachnosis de mango** -
parecido de CERISA
remedio: DITANO M 456 15/100 grs
Antiracel (4 1/2 16/100 H₂O grs)

I Moscas ^{Plegas de puntas:}

- ① Mosca mejicana de la fruta
ANASTREPHOSP
- para atran y matarlos
se usa proteína hidrolizada
(1 lb), dipterox S.P. 80 (600 gms)
y 100 litros H₂O

1 lb. levadura + 1 gal. miel
de caña en vez
de proteína hidrolizada
+ 100 litros agua
y se aplica con una
bomba.

- ② Mosca neoliterana
(afecta los cítricos
principalmente)
"Ceraletis capitata"

II ESCAMAS (de cítricos por lo general)

- ① Escama de Florida
"purpurea"

ó (3-5 lbs a cada 100 gal)
Aceite Agriolo (no es tipo
de moto - es tipo especial
foliar alarso 1 cc./11 gal.

Se aplica 3 veces por
lo menos para matar
todos los insectos en
sus varias etapas

III Afidos ó Pulgones

- ① Aphis sp.
② Toxoptera sp.

CAUSA tristeza (afidos se
comen parte
de hoja con
vianos
SISTEMATICOOS después

Metasistox

Cugon

Dipterox S.P. 80

Malathion EC 57 90

1 1/2 lt. y 100 litros H₂O

Arañas rojas (4 p. patas)

② Tetranychus sp. - con predadores

asomb.
de
insectos
etc.

Metasistox

Cugon

Kelthane

③ Barredos de las ramas

del aguacate

remedio: combinación

de Folido M. y Dipterex
(180 cc) (400 gr)

para 100 gal. H₂O

{ Folido M. (180 cc) 100
D.D.T. 50% (2 lbs) gal

con 100 gal. H₂O

④ afecta aguacate

↓
gorgojos del aguacate

remedio

D.D.T. 50% 2 lbs. } 100
Folido M. 180 cc. } gal
agua

⑤ agalla del aguacate

remedio:

METASISTOX

dipterex

Bidrin

Folido M.

⑥ En contra Zompopos (afecta
citricos)
remedio:

Atta sp.

Remedio: Chloradana en las
entrada s de los zompopos

⑦ gases venenosos - más
rapido tratamiento
(es. Bromuro de
metilo) 1 lb

Fertilizantes :

Minerales del suelo :

① Mayores:

nitrogenio, fosforo, potasio

② menores:

magnesio, manganeso, zinc,
cobalto, boro, molibdeno,
cobre, hierro

TABLAS DE ARITMETICA

*una
frigorifera
de sopa*

S U M A R

1+1=2	2+1=3	3+1=4	4+1=5	5+1=6	6+1=7	7+1=8	8+1=9	9+1=10
1 2 3	2 2 4	3 2 5	4 2 6	5 2 7	6 2 8	7 2 9	8 2 10	9 2 11
1 3 4	2 3 5	3 3 6	4 3 7	5 3 8	6 3 9	7 3 10	8 3 11	9 3 12
1 4 5	2 4 6	3 4 7	4 4 8	5 4 9	6 4 10	7 4 11	8 4 12	9 4 13
1 5 6	2 5 7	3 5 8	4 5 9	5 5 10	6 5 11	7 5 12	8 5 13	9 5 14
1 6 7	2 6 8	3 6 9	4 6 10	5 6 11	6 6 12	7 6 13	8 6 14	9 6 15
1 7 8	2 7 9	3 7 10	4 7 11	5 7 12	6 7 13	7 7 14	8 7 15	9 7 16
1 8 9	2 8 10	3 8 11	4 8 12	5 8 13	6 8 14	7 8 15	8 8 16	9 8 17
1 9 10	2 9 11	3 9 12	4 9 13	5 9 14	6 9 15	7 9 16	8 9 17	9 9 18

R E S T A R

1-1=0	2-2=0	3-3=0	4-4=0	5-5=0	6-6=0	7-7=0	8-8=0	9-9=0
2 1 1	3 2 1	4 3 1	5 4 1	6 5 1	7 6 1	8 7 1	9 8 1	10 9 1
3 1 2	4 2 2	5 3 2	6 4 2	7 5 2	8 6 2	9 7 2	10 8 2	11 9 2
4 1 3	5 2 3	6 3 3	7 4 3	8 5 3	9 6 3	10 7 3	11 8 3	12 9 3
5 1 4	6 2 4	7 3 4	8 4 4	9 5 4	10 6 4	11 7 4	12 8 4	13 9 4
6 1 5	7 2 5	8 3 5	9 4 5	10 5 5	11 6 5	12 7 5	13 8 5	14 9 5
7 1 6	8 2 6	9 3 6	10 4 6	11 5 6	12 6 6	13 7 6	14 8 6	15 9 6
8 1 7	9 2 7	10 3 7	11 4 7	12 5 7	13 6 7	14 7 7	15 8 7	16 9 7
9 1 8	10 2 8	11 3 8	12 4 8	13 5 8	14 6 8	15 7 8	16 8 8	17 9 8
10 1 9	11 2 9	12 3 9	13 4 9	14 5 9	15 6 9	16 7 9	17 8 9	18 9 9

M U L T I P L I C A R

1x1=1	2x1=2	3x1=3	4x1=4	5x1=5	6x1=6	7x1=7	8x1=8	9x1=9
1 2 3	2 2 4	3 2 6	4 2 8	5 2 10	6 2 12	7 2 14	8 2 16	9 2 18
1 3 3	2 3 6	3 3 9	4 3 12	5 3 15	6 3 18	7 3 21	8 3 24	9 3 27
1 4 4	2 4 8	3 4 12	4 4 16	5 4 20	6 4 24	7 4 28	8 4 32	9 4 36
1 5 5	2 5 10	3 5 15	4 5 20	5 5 25	6 5 30	7 5 35	8 5 40	9 5 45
1 6 6	2 6 12	3 6 18	4 6 24	5 6 30	6 6 36	7 6 42	8 6 48	9 6 54
1 7 7	2 7 14	3 7 21	4 7 28	5 7 35	6 7 42	7 7 49	8 7 56	9 7 63
1 8 8	2 8 16	3 8 24	4 8 32	5 8 40	6 8 48	7 8 56	8 8 64	9 8 72
1 9 9	2 9 18	3 9 27	4 9 36	5 9 45	6 9 54	7 9 63	8 9 72	9 9 81
1 10 10	2 10 20	3 10 30	4 10 40	5 10 50	6 10 60	7 10 70	8 10 80	9 10 90

D I V I D I R

1÷1=1	2÷2=1	3÷3=1	4÷4=1	5÷5=1	6÷6=1	7÷7=1	8÷8=1	9÷9=1
2 1 2	4 2 2	6 3 2	8 4 2	10 5 2	12 6 2	14 7 2	16 8 2	18 9 2
3 1 3	6 2 3	9 3 3	12 4 3	15 5 3	18 6 3	21 7 3	24 8 3	27 9 3
4 1 4	8 2 4	12 3 4	16 4 4	20 5 4	24 6 4	28 7 4	32 8 4	36 9 4
5 1 5	10 2 5	15 3 5	20 4 5	25 5 5	30 6 5	35 7 5	40 8 5	45 9 5
6 1 6	12 2 6	18 3 6	24 4 6	30 5 6	36 6 6	42 7 6	48 8 6	54 9 6
7 1 7	14 2 7	21 3 7	28 4 7	35 5 7	42 6 7	49 7 7	56 8 7	63 9 7
8 1 8	16 2 8	24 3 8	32 4 8	40 5 8	48 6 8	56 7 8	64 8 8	72 9 8
9 1 9	18 2 9	27 3 9	36 4 9	45 5 9	54 6 9	63 7 9	72 8 9	81 9 9
10 1 10	20 2 10	30 3 10	40 4 10	50 5 10	60 6 10	70 7 10	80 8 10	90 9 10



PRODUCTO CENTROAMERICANO
HECHO EN HONDURAS

May 28, 1969

Shawar, Depto.

de Lengua

Dear Wilson,

I have a terrible vice
— great correspondence spurs
or stand-stills! I have just
been in the latter for a
month, as five telegrams
from various members of
my family in the last week,
have been so clear to point
out. Deeply chagrined — please
forgive me!

April 21-26th I was
at the fruticultura course
in Comayagua — it was invaluable
for me. The only complaint
one could make about such
a short course was that
the classes weren't held
outside in the orchards
where everything — from soils
to diseases — could be much
more practically and graphically

explained. ~~the~~ instructor who
 ended up giving most of the
 classes - Julio Barahona - an
 alumnus of yours - was excellent
 and spent the last day of
 classes with us out in the
 orchards showing and teaching
 us how to graft and prune.
 Each of us had to prune one
 tree, graft at least one
 citrus, and one mango or
 avocado tree. Besides the class
 and orchard work, before we
 left we were given about
 half a ton of mimeographed
 articles drawn up by various
 members of the D.E.S. nearest
 staff specializing in fruits -
 or diseases, pruning, fruit tree
 types, fertilizers, and insecticides, etc.
 About fifty of us showed
 up for the course - we were
 an interesting and jolly mixture
 - teachers, campesinos, small
 entrepreneurs, a missionary,
 the foreman of a large San Pedro
 finca, and an

I'm enclosing the "portrait" of the consille and my class notes so you'll see what sort of things the instructor covered, plus a drawing by Celea, the eighteen-year-old in my Honduran family, of the "Andénico de los Confines" doorway so you could have it to compare 1st-hand with your "Casa de los Leones" in Antigua.

Again the drawing you sent me, the doorway in Brown's looks sufficiently different to me to be something other than a copy of the Antigua, Guatemala one. However, one thing I don't understand is that if the Brown's one is authentic, how can it ~~be~~ show be less primitive and more finished and life-like than the Guatemala one? What do you think? Also why does the Honduran doorway have a heraldic emblem and the Guatemala

one more? Which would have been more common in those days? By the way, doesn't the Guatemalan doorway look Arabi - with those tiles, and the flowers and vines on the pillars?

While I was in Comayagua I met the manager of Ken's in Guatemala. He flew in to Comayagua to attend a meeting with representatives of a local agricultural co-op in the valley there, to offer them a contract to grow 250,000 tons of Tomatoes for the Ken's factory in Guatemala.

Dracul is as severe as ever but certainly keeps one quiet. I've seen in Choluteca, Tegucigalpa, San Pedro Sula, and Santa Rosa de Copan in the last month on errands or to drum up help of some sort for the women's institution

organization it started, the
co-op, my main work here,
and the library we want to
sponsor for the community
through the co-op.

More recently, two weeks ago
I was in La Pasa, the next
town to Graeco, helping them
in their efforts to start a
savings and loan co-op there.
It's a necessity for them - they
haven't even got ~~a~~ a bank
office there and they have the
same population as Graeco; better
land (coffee and potatoes); and
more money. Last week the
Graeco co-op bought the land
to construct our building on -
and needless to say we are
astute, my friend. To
Graeco last Sunday, was asked
to look at our lot by the
"directors" of the co-op, and
volunteered to do the design for
us, he'll bring it this Sunday.
Dona Rosita showed me

the beautiful bamboo you sent - it really is nice. I think I'll try to plant some in San Pedro when I live there. Bamboo always reminds me of the Philippines and Bagio, where I lived as a little child.

As for the latest Lomiro news, Colonel Doarte, the Desarmat agent when you were here, was promoted to a job in the Santa Rosa regional office and we have a new agent now. He's bringing in 300 citrus trees next week and will be a very willing worker for a 'vivero de frutas' project.

In your last letter you said you were coming back in July or August, according to how your schedule works out - it will be a great thing if you can! My only unhappiness is that

I might not be here when you come. I plan to leave Gracia on July 3rd for San Pedro Sula and Tegucigalpa, and the U.S. by July 15th. I must get back to help my family with the wedding, and to take care of my legal and financial arrangements if I'm to live permanently in Central America. Carramba, my greatest adventure yet!

I hope you're having a happy, enjoyable time in Antigua - a man like you must be. A thousand kind thoughts. Eudise.

Your friend,

P.S. Don Bernardo planted a vegetable garden on the spot you said. It's growing very well - I just ate the first radishes from it - delicious.

P.

A. P. S.

What are the chances
for olive growing around
Llano? I started thinking
about them when I read
about them in a book on
"fruticultura". There are wild
olives down by Condelaria and
Gualense in Southern Spain
which nobody harvests commercially
- could this mean the trees
could be grown successfully
here? The fact that the trees
are so hardy, live so long,
and give oil as well as
the fruit for insecticides (which
the women around here make
very much) as
products - interests me
greatly. I've been trying to
get hold of some olive
trees to plant but DESPERRA
etc. says there aren't any
in Honduras. When would be

a good place to get them from?

Another thing I've had trouble getting are edible soybeans. I need 20 pounds of them for a nutrition experiment I want to try in "Grass" and have put in three orders at various farms, plus the government here - with no result. Where can I find soybeans - the kind for eating?

Pam
[Sealanders]

[Sealanders]

Antigua Guatemala, 16 June 1969

Pam dear,

When I returned from a hasty trip to Miami and Boston a few days ago I found that very interesting letter of yours, the note book with the results of the adiestramiento en fruticultura, and the fine drawing of that perplexing door. The latter I have just sent on to Verle Annis, who has recently published a magnificent book on colonial architecture and who knows better than anybody else how to figure out this door business. We'll see what has to say. Before you leave there, do you think you can get any more information out of the old timers? The trouble is, there seem to be so few of them left in Gracias.

That note book almost knocks me over - such a fine job! I assume you want me to send it back, don't you? I would like to study it a bit more. Your Julio Barahona I can't locate among the graduados of El Zamorano, as they call us locally. Among the Honduran graduates of 1955 there is an Armando Barahona and in 1966 a Rolando Barahona. I suspect it must be one of these two. Will you let me know? From what you say, it appears to me that I might be able to cooperate with him in connection with a vivero and the obtaining of fruit trees from Zamorano. I am wondering if Don Bernardo is ready to start planting fruit trees on that property we visited. If so, I would ask Bob Armour at Zamorano to ship him some - this would be at my expense of course, - but I would like to be sure he is prepared, this year, to give the trees water and good care. Incidentally, I will be sending him some seeds of the Red Ceylon peach before long. I am not sure that Don Bernardo is back from the States - he wrote that they were going. This Red Ceylon peach has the lowest chilling requirement of all peaches known to us, and I believe will do better at Gracias than any other.

It is a small peach, but of good flavor, and it bears tremendous crops. My tree here is now maturing more than a thousand fruits. The only objection to it is that the fruits are red around the seed and when cooked they make a red sauce, which is pretty enough but folks think peaches should be ^{yellow} ~~red~~.

About the olives - nothing doing. The Spaniards started planting olives in Central America in the early days of colonization, and though an occasional fruit is produced at high elevations (6000 feet), nowhere have they become commercial. But here is the real catch in the olive business: the fruit they call aceituno in Honduras and El Salvador is not an olive at all. It is a species of Bursera; the fruits look like olives but are not good to eat. They yield an oil which has been used on a small scale, in El Salvador, for margarine, but that is a very different matter. What has added to the confusion about olives is that the nuns who have a place in Santa Rosa de Copan, obtained years ago from Tito Perez Estrada in San Pedro Sula a tree of a species of Elaeocarpus which bears fruit which look like olives and they, being Spanish, were excited when they found that these fruits, when pickled, could be eaten. But the main factor was nostalgia; this fruit, which we have at Lancetilla near Tela, is not worthy of commercialization because it is really no good.

When you go to live in San Pedro I hope you will have a big enough sitio so you can plant some of the fine bamboos which I can get for you at Lancetilla. And some fruit trees too. I know that region pretty well and we ^{have} many things at Lancetilla which you should grow, including that excellent fruit the lychee.

But going back to the Gracias problem (I am sorry you cannot be there much longer) is the new Extension Agent going to start a nursery? The very best way to develop fruit culture in a new area is

by having a man who knows to run a nursery, who will stay with it for a while, and produce and supervise the cultivation of fruits trees in his area. All our tropical governments have ~~attempted~~^{tried} so much, and they are so short of good personnel, that we are not getting ahead as rapidly as we should. Continuity is our big problem, after the matter of competent personnel.

Having been away for two weeks up north I shall not be able to get back to Gracias very soon. Perhaps it is just as well. You are leaving, the new Extension Agent is an unknown quantity and I doubt that Don Bernar~~do~~^{do} will be ready to do much this year. I am glad he has started a vegetable garden. I wish others would do it. You remember they told me when I was with you that you have to import vegetables for your own needs. This should not be. How I wish I was younger, was still at Zamorano, and could go over to Gracias about twice a year with a big load of trees and seeds!

You ask about edible soy beans. I don't know much about them and don't know where you can obtain seeds of good edible varieties. Nor do I feel sure that people will eat soy beans; I would think anything done with soy beans must be on the basis of commercial products. And we don't need more kinds of beans, really, we just need more beans, of the kinds people know and like. At a meeting we had here last year, on the subject of diversification, I said "I sure believe in diversification, and I suggest we begin to diversify by growing more corn, rice and beans". Of course we must and are going to diversify, but it takes time to develop new crops on a big commercial scale. Let's keep on doing it, but in the meantime let's grow more of the staple foodstuffs. Of course there we get into the problem, who is going to buy for cash, our surplus corn rice and beans? And is where the economists have me licked.

Affectionately yours,

To the North of the Humuya

By AL FOSTER

COMAYAGUA—If you stop on one of the newly paved streets of Comayagua and ask for directions to the Centro Nacional de Agricultura y Ganadería you may draw a blank stare. Most Comayaguans still call the farm "la Stica," a hangover from pre-golpe times. A few refer to it as "el Banco," confusing it with the Banco Nacional de Fomento. To avoid confusion, it's best to cross the Humuya River bridge on the north city limits and look for the sign marking the entrance.

The center is an 8,000 acre farm operated by Desarrural, the agricultural extensión agency of the Honduran government. Desarrural's stated aim is to contribute to the economic development of Honduras through technical aid to small farmers, introduction of improved seeds, fertilizers and insecticides and production of purebred cattle. Desarrural is semi-autonomous, which means, according to one Honduran, that only the chiefs are fired when the government changes. Perhaps I didn't recognize the Honduran gesture equivalent to tongue in cheek.

Last year the center produced 450 new animals and sold 300. The total animal population is 1,400, mostly registered Brahma beef cattle. Also seen on the farm's irrigated green pastures are a few Santa Gertrudis and Charolais beef cattle, Brown Swiss and Holstein dairy cattle and registered Tennessee walking horses.

Sale of yearling bulls (at from L. 500.00 to L. 2,500.00 each) last year netted more than L. 200,000. This portion of the program makes a significant contribution to upgrading Honduran agriculture, even though some cynics may feel it is aiding the part of the popu-

The dairy has the beginnings of profitable herd. Last year butter sales reached L. 20,000 from more than 600,000 pounds of milk. Volunteer Nick Howes, who works at the dairy, is seeking new means of improving its production.

Grafted fruit tree sales provided another L 20,000 last year to use toward meeting the operating expenses of the farm. Honey from the bees used to pollinate the orchards is a bi-product.

On the more scientific side, the agronomy department is conducting extensive plant breeding work with corn, sorghum, rice and beans. These are cooperative programs with other Central American countries, and rate with the best agricultural research anywhere. Last year the seed plants produced 300 tons of corn and 90 tons of

beans.

A small vegetable breeding program started this year and is making a start toward seed production and improvement of varieties of tomatoes, sweet corn, onions, watermelon and yuca.

The center also serves as an education center. More than 300 students annually spend a week at the farm learning basics of cattle, grain and fruit production. Even Peace Corps will be involved this year with one week of training in agriculture for trainees of Group XIII.

The farm combines the functions of agricultural experiment station, extension college, conference center, seed producer and animal breeding farm. It does this on a predominantly self-supporting level. Think on these things next time you discuss its shortcomings.



FARM FEATURES CUCUMBERS AND CHAROLAIS
Volunteer Al Foster, left, and Francisco Salgado inspect cucumber patch in the vegetable garden of Desarrural's experimental farm. Salgado is