DEVELOPMENT AND VALIDATION OF
A SEQUENTIAL SAMPLING PLAN
FOR THE PECAN WEEVIL IN
A COMMERCIALLY MANAGED
PECAN ORCHARD

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CHAPTER I

INTRODUCTION

The pecan tree, *Carya illionensis* (Wang.) K. Koch is said to be one of the largest of the native hickories. According to Brison (1974), the pecan tree is the most horticulturally important plant native to the United States. In 1978 a total of 250,700,000 lbs. of pecans were produced in the United States, with a net value of $150,420,000. In Oklahoma 15,500,000 lbs. of pecans were produced in 1978, with a net value of $9,300,000. This tree, which produces a beautiful wood, is noted mainly for the very fine tasting, edible nut that it produces.

The pecan tree is native to the United States (Brison 1974). Its native range follows the Mississippi Rover and its tributaries. Native pecans are found primarily in Oklahoma, Texas, Louisiana, and Mississippi, and to a lesser degree in Kansas, Missouri, Tennessee, Kentucky, Illinois, and Iowa (Brison 1974). Improved cultivars of pecans have been extensively planted in states where pecans are not native. These states include New Mexico, Arizona, Alabama, Georgia, Florida, and South Carolina (Brison 1974). Improved cultivars are also being planted in the native pecan growing regions of the country.

Each year numerous insect pests and diseases capable of inflicting severe damage attack both the nut and the tree. One of the more serious pests of the pecan throughout the pecan growing region (except New Mexico, Arizona, and West Texas) is the pecan weevil, *Curculio caryae*.

(Horn). Neel and Shepard (1976) indicated that this is the most important arthropod pest on pecans.

The most common means used for controlling the pecan weevil is with chemical insecticides. Treatments are directed at the adult stage, since this is the stage that is most susceptible to the toxicant.

Various sampling procedures have been developed to determine when treatments need to be made. To date, all of these sampling procedures have focused on sampling the adult stage of the pecan weevil. Currently, no work has been reported on using punctured nuts as a means of making treatment decisions for pecan weevil control.

The primary objective of this study was to determine the feasibility of a sequential sampling plan using punctured nuts as the sampling unit, and comparing it to another sampling method that uses adult pecan weevils as the sampling unit.

Information regarding the types and amount of damage caused by the pecan weevil, and what effects nut cluster size has on the selection of nuts for feeding and oviposition by the pecan weevil was needed before the sequential sampling plan could be implemented.

CHAPTER II

IMPACT OF PECAN WEEVIL DAMAGE OF PECAN PRODUCTION

Throughout the growing season the pecan tree, Carya illinoensis (Wang.) K. Koch and its fruit, the pecan, are susceptible to attack from numerous insect pests. From the standpoint of production one of the important pests of pecans in most pecan growing areas is the pecan weevil, Curculio caryae (Horn) (Eikenbary et al. 1977, and Harris and VanCleave 1974). The eggs of the pecan weevil are inserted into the nut during August, September, and October, but the oviposition period may vary as a result of the season or cultivar of pecan. Upon hatching, the larvae feed on the pecan kernel for about four weeks, drop to the soil and commonly burrow into the ground to a depth of 10-30 cm., where the larvae remain for one to two years. The pupal stage lasts for about three weeks and the adults remain in the soil until the following summer. The complete life cycle requires two to three years (Harp and VanCleave 1976a, b, c, Harris 1976, and Osburn et al. 1963).

Damage and nut loss due to adult weevil feeding, oviposition, and subsequent larval feeding can be classified into four general categories 1) premature nut drop due to adult feeding, 2) blackspots resulting from adult feeding, 3) shriveled kernels caused by adult feeding, and 4) destruction of the kernel by feeding larvae (Moznette et al. 1931, 1940, Hinrichs and Thompson 1955, Boethel and Eikenbary 1979). The type and extent of this damage depends on three factors 1) population size, 2) when weevil emergence occurs, and 3) when a given cultivar reaches maturity (VanCleave and Harp 1971). VanCleave and Harp (1971) also observed that early maturing cultivars are the most severely damaged.

Losses not only occur during growth and development of the pecan, they can also occur during the processing stage (harvesting, shelling, and packaging). Losses incurred during processing are due primarily to the extra time and labor that is needed to sort damaged nuts and kernels, and to remove weevil larvae (Boethel and Eikenbary 1979). Those portions of the damaged kernels that are good are subsequently packaged and sold at lower prices.

Aside from the most obvious sign of pecan weevil damage (presence of a weevil emergence hole in the nut), very little seems to be known about the other types of pecan weevil damage (black spots, shriveled kernels, and premature nut drop). Therefore, to obtain a better understanding of pecan weevil damage, a study was conducted to determine the amount and type of damage to pecans due to pecan weevil feeding and oviposition in a commercial orchard that is under a pest management program.

Methods and Materials

The study was conducted at the Samuel Roberts Noble Foundation, Inc., Red River Demonstration and Research Farm. The farm is located southeast of Burneyville, Oklahoma, in Love county.

Ten pecan trees of the cultivar "Squirrels Delight" were selected for the study in 1974 and 15 trees in 1976. The trees were not selected at random, but were selected on the basis of having high pecan weevil populations. Due to heavy pruning of the lower branches of the "Squirrels Delight" trees for disease control (pecan scab), ten trees of the cultivar "Stuart" were selected for study in 1977 and 1978. A high pecan weevil population was again the main criterion for tree selection.

One hundred and fifty nuts were tagged on each tree (except in 1975 when 123-136 nuts per tree were tagged). The nuts occurred on both cultivars in cluster sizes of one, two, three, and four nuts per cluster. The nut cluster were tagged in such a way that the number of tagged clusters was proportional to the number of one, two, three, and four nut clusters estimated to occur in the trees.

Since it has been determined that there is no significant difference in infestation between different height levels and sectors within a pecan tree (Boethel et al. 1974), all tagged nuts were located ca. 2-4 m. above the ground. Nuts were tagged in all four quadrants of the tree and at various distances outward from the trunk. Nuts were tagged using (2.5 cm.) circular metal rimmed cardboard tags on which was listed the tree number and nut number(s). All nuts within a selected cluster were numbered and examined. In addition, strips of orange plastic flagging were fastened to branches containing tagged nuts to aid in their relocation.

Observations were initiated during the first week of August and were continued until harvest. Observations were conducted at weekly intervals, except during periods of high weevil emergence and just prior to shuck split, when observations were conducted twice weekly.

Observations involved inspecting each of the nuts to determine if there was any damage done to the nut by either insects or disease. Nuts punctured by the pecan weevil could be distinguished by the presence of a small, but distinct hole in the shuck of the nut. However, it was not possible to distinguish between feeding and ovipositional punctures while the nut was on the tree.

Weevil activity was monitored using the cone emergence trap method as described by Eikenbary et al. (1977, 1978). Because of interest in the occurrence and type of nut damage that occurred under a pest management program in a commercial orchard, the study trees were treated in the same manner as the rest of the orchard (Hedger et al. 1978).

The remaining tagged nuts were harvested at shuck split and taken to the laboratory for further evaluation. Evaluation consisted of cracking the nuts and checking for kernel damage at the place of nut puncture, and for the presence of pecan weevil larvae or larval emergence holes in the nut.

Results and Discussion

There are four different categories of damage to pecans caused by the pecan weevil and all four categories were observed in the managed orchard. The most prevelent type of damage attributed to the pecan weevil during the four year study was premature not drop associated with adult feeding. It was also observed that ca. 20% of the total nut loss that occurred was from causes unknown at the present time.

The amount of premature nut drop was due in part to the period of time when maximum weevil activity occurred and the stage of development (Woodroof and Woodroof 1927, Hinrichs and Ramming 1973, and Calcote 1975), that the nut was in at that time. This was evident in 1975 and 1977 when pecan weevil activity occurred while the nut was still in the "water stage" (endosperm is non-cellular). During these two years a large number of nuts punctured by the pecan weevil (Table I) dropped prematurely, with most of the nuts dropping within two weeks after puncturing. This is similar to the findings of Hinrichs and Ramming (1972) and Calcote (1975).

Premature nut drop as a result of weevil activity was also the primary cause of known nut loss in 1976 and 1978, although fewer nuts fell during those two years (Table I). Maximum pecan weevil activity occurred during late August and early September when the nuts were in the "gel" or "dough" stage (Harris 1976a). Besides the late weevil emergence, relatively few weevil emerged from the soil possibly because of the drought conditions that existed in 1978. Nuts punctured while in the "dough" stage generally remained on the tree (Calcote 1975).

With respect to the number of nuts tagged, nuts containing or having contained weevil larvae (ovipositional damage) were few during the four years the study was conducted. In 1976, 20 nuts were found to contain pecan weevil larvae. In 1975 and 1977, only one nut contained pecan weevil larvae, while in 1978 no nuts were found to contain pecan weevil larvae (Table I).

The lack of ovipositional damage in 1978 could possibly be due to the low numbers of pecan weevil emerging and to proper timing of insecticide applications. Although emergence was heavy in 1975 and

TABLE I

EVALUATION OF PECAN WEEVIL DAMAGE BY TREE
IN A COMMERCIALLY MANAGED ORCHARD

Tree #	# Nuts Tagged	# Nuts Punct.	# Punct. Nuts Dropped	# Nuts with Black Spots	# Nuts with Shriveled Kernels	# Nuts with Larvae	# Nuts Unknown
			(1975 Cultivar: "Squirrels Delight")				
1	126	13	7	-	-	-	34
2	129	5	2	-	-	-	27
3	123	8	4	-	-	-	30
4	129	15	4	-	-	-	46
5	127	33	12	-	-	-	9
6	123	6	2	-	-	-	41
7	126	11	1	-	-	-	56
8	127	9	6	-	-	-	33
9	136	9	8	-	-	-	41
10	127	13	3	-	-	-	39
Total	1273	122	49	-	-	-	356

TABLE I (Continued)

Tree #	# Nuts Tagged	# Nuts Punct.	# Punct. Nuts Dropped	# Nuts with Black Spots	# Nuts with Shriveled Kernels	# Nuts with Larvae	# Nuts Unknown
			(1976 Cultivar: "Squirrels Delight")				
1	150	5	0	2	0	0	30
2	150	1	0	0	0	0	21
3	150	4	0	0	0	0	27
4	150	2	1	1	0	0	22
5	150	10	7	2	0	0	40
6	150	17	2	1	1	2	20
7	150	7	1	0	0	1	16
8	150	13	2	0	2	0	24
9	150	29	8	0	3	2	25
10	150	21	9	0	1	2	17
11	150	9	3	0	1	1	30
12	150	16	2	0	1	4	12
13	150	19	4	2	0	5	18
14	150	8	0	0	1	1	20
15	150	7	0	0	0	2	10
Total	2250	168	39	8	11	20	342

TABLE I (Continued)

Tree #	# Nuts Tagged	# Nuts Punct.	# Punct. Nuts Dropped	# Nuts with Black Spots	# Nuts with Shriveled Kernels	# Nuts with Larvae	# Nuts Unknown
(1977 Cultivar: "Stuart")							
1	150	69	42	1	0	0	42
2	150	43	26	0	0	0	51
3	150	22	8	0	0	0	39
4	150	17	5	0	2	0	36
5	150	11	5	0	0	0	38
6	150	28	8	0	1	0	16
7	150	21	7	1	2	1	22
8	150	48	26	2	2	0	33
9	150	22	7	1	0	0	58
10	150	5	0	0	1	0	18
Total	1500	286	134	5	8	1	353

TABLE I (Continued)

Tree #	# Nuts Tagged	# Nuts Punct.	# Punct. Nuts Dropped	# Nuts with Black Spots	# Nuts with Shriveled Kernels	# Nuts with Larvae	# Nuts Unknown
			(1978 Cultivar: "Stuart")				
1	150	14	2	0	1	0	28
2	150	8	5	0	1	0	39
3	150	0	0	0	0	0	26
4	150	0	-	0	0	0	29
5	150	2	0	0	0	0	36
6	150	6	1	0	0	0	34
7	---a/	-	-	-	-	-	--
8	150	12	3	0	0	0	55
9	150	7	1	2	0	0	57
10	150	7	1	-	0	0	36
Total	1500	56	13	2	3	0	340

a/ No nuts on tree in 1978.

and 1977, it occurred at a time when the nut was not suitable for oviposition. By the time the nuts were suitable for oviposition very few weevil were found to be emerging.

Two other types of damage encountered, when evaluating nuts punctured by the pecan weevil, were shriveled kernels and kernels with black spots. These two types of damage were also encountered in relatively low numbers (Table I). The shriveled kernels are caused when the puncture by the feeding female penetrates through the integument while the nut is in the "dough" stage, while the black spots are the result of the punctures penetrating only into the integument (Boethel and Eikenbary 1979). After shell hardening the male feeds in the shuck and usually does not penetrate the shell, resulting in minimal or no kernel damage (Calcote 1975). This type of damage was light in comparison to the number of nuts dropped prematurely due to weevil feeding. However, it was still higher than the number of nuts lost due to larval feeding within the nut for all years the study was conducted, except 1976.

The presence of pecan weevil larvae in the nut and the presence of emergence holes in the nut have been the means by which most growers, researchers, and extension workers measure pecan weevil damage.

Results from this study indicate that a significant portion of the damage by the pecan weevil occurs from feeding punctures while the nut is still in the free endosperm state ("water stage"), resulting in premature nut drop. The full extent of damage during this period is seldom realized by the growers, researchers, or extension workers because no quantitative data is obtained of nuts aborted from the tree. Premature abortion is usually attributed to some other insects such as the hickory shuckworm, to some unknown physiological factor such as drought stress, or ignored. Other types of damage attributed to weevils such as black spots, shriveled kernels, and ovipositional damage that occurred during the study were minimal in relation to premature nut drop.

Although the amount of damage caused by the pecan weevil in relation to the number of nuts tagged appears small, if projected over an entire orchard, the damage encountered can contribute significantly to nut loss and to a reduction in nut quality.

From this study it can be seen that more economic damage results from early weevil emergence and subsequent adult feeding than any other type of weevil induced damage in an orchard under a pest management program. However, throughout the study losses due to unknown reasons was the most prominent type of nut loss. Further investigation is needed to try and determine the causes of this type of nut loss.

CHAPTER III

EFFECTS OF PECAN NUT CLUSTER SIZE ON THE SELECTION OF NUTS FOR FEEDING AND OVIPOSITION BY THE PECAN WEEVIL, *CURCULIO CARYAE* (HORN) (COLEOPTERA: CURCULIONIDAE)

Various sampling techniques by numerous investigators have been developed to determine when insecticide applications should be made for controlling the pecan weevil on pecan trees (*Carya illinoensis* (Wang.) K. Koch). However, none of these methods has come into widespread use (Boethel et al. 1976a). These sampling schemes include jarring or shaking the lower limbs of pecan trees to dislodge weevils onto a canvas or plastic sheet (Moznette et al. 1931, Dupree and Beckman 1953, Osburn et al. 1963, Boethel et al. 1976a), the use of a quick knockdown insecticide such as Pyrenone (Boethel et al. 1976a), tanglefoot spread in bands at different heights around the tree trunk to capture adult weevils as they crawl up the trunk of the tree (Beckman and Dupree 1954, Hinrichs and Thomson 1955, Nash and Thomas 1972, Boethel et al. 1976a), a cloth or burlap bag wrapped around the tree trunk (West and Shepard 1974, 1975), and various types of ground cover traps such as cloth tents and cone emergence traps (Raney and Eikenbary 1969, Raney et al. 1970, West and Shepard 1974, 1975, and Boethel et al. 1976).

One type of sampling that has not received any attention is to sample pecans for damage caused by the pecan weevil. However, before a sampling scheme based on damage can be utilized it is important to know whether or not the pecan weevil demonstrates a preference for a given nut cluster size. Therefore, a study was conducted to determine what effects nut cluster size has on the selection of nuts for feeding and oviposition by the pecan weevil.

Methods and Materials

The design for this study was nearly identical to the design for the study described in Chapter II. Nut puncture data collected in 1975, 1976, and 1977 was used for the analysis. Only trees 1-10 of the "Squirrels Delight" cultivar (cultivar used in 1975 and 1976) were used. The additional five trees sampled in 1976 were dropped from this study.

All trees were treated, and all nuts were evaluated according to the procedures described in Chapter II.

Results and Discussion

Briefly summarizing the nut puncture data: in 1975, 105 out of 1271 nuts were punctured; in 1976, 127 out of 2250 nuts were punctured; and in 1977 286 out of 1500 nuts were punctured.

During the 3 year study only 0.04% of the punctured nuts were ovipositional punctures, with 0.8% of the nuts punctured in 1975 and 0.9% of the nuts punctured in 1976 being ovipositional punctures. There was only one ovipositional puncture in 1977.

For analyais, the data was divided into the number of clusters punctured in relation to the number of clusters within a given nut cluster size category.

The data was then transformed using an arc sine transformation to stabilize the variance. Comparisons were then made between the 1975 and 1976 data and between the 1976 and 1977 data.

For the years 1975 and 1976 in which trees one through ten were identical, a randomized complete block design was used for analysis. As mentioned earlier, the extra five trees used in 1976 were dropped from the study.

To compare the cultivar "Stuart" used in 1977 and the cultivar "Squirrels Delight" used in 1975 and 1976 a different means of analysis had to be employed. Because of similarities in weevil emergence and numbers of nuts punctured it was decided that a comparison be made between the data collected in 1976 and 1977. A factorial analysis of variance was selected for the analysis primarily because of the switch to different trees of a different cultivar.

In either case (randomized completed block design and factorial analysis of variance) when analyzing the number of nut clusters punctured, in relation to the number of clusters in a given cluster size category, no significant differences were found (Tables II, III). This seems to indicate that the pecan weevil, when selecting nuts for feeding and oviposition does not select nuts occurring in any particular nut cluster size category.

However, when breaking down the nut puncture data into the number of nuts punctured, in relation to the number of nuts in a given cluster size category, and then analyzing this data by the same methods as above, one comes up with (in both cases) apparently the opposite results (Tables IV, V).

TABLE II

RANDOMIZED BLOCK DESIGN FOR COMPARISON OF 1975 AND 1976 DATA
BASED ON PUNCTURED CLUSTERS. CULTIVAR:
"SQUIRRELS DELIGHT"

Source	D. F.	Sum of squares	Mean squares	F value
TREE	9	0.6069	0.0674	1.8207
CS	2	0.0903	0.0451	1.2184
TREE * CS	18	0.5095	0.0283	0.7642
YR (TREE CS)	30	1.1112	0.0370	

TABLE III

FACTORIAL ANALYSIS OF VARIANCE FOR COMPARISON OF 1976 AND 1977 DATA BASED ON PUNCTURED CLUSTER. CULTIVARS: "SQUIRRELS DELIGHT" AND "STUART"

Source	D. F.	Sum of squares	Mean squares	F value
YR	1	1.2561	1.2561	29.8762
CS	2	0.1313	0.0657	1.5615
YR * CS	2	0.1034	0.0517	1.2299
TREE (YR CS)	69	2.9011	0.0420	

TABLE IV

RANDOMIZED BLOCK DESIGN FOR COMPARISON OF 1975 AND 1976
DATA BASED ON PUNCTURED NUTS. CULTIVAR:
"SQUIRRELS DELIGHT"

Source	D. F.	Sum of squares	Mean squares	F value
TREE	9	0.2818	0.0313	1.6047
CS	2	0.2136	0.1068	5.4732
TREE * CS	18	0.2180	0.0121	0.6207
YR (TREE CS)	30	0.5855	0.0195	

TABLE V

FACTORIAL ANALYSIS OF VARIANCE FOR COMPARISON OF 1976 AND 1977 DATA BASED ON PUNCTURED NUTS. CULTIVARS: "SQUIRRELS DELIGHT" AND "STUART"

Source	D. F.	Sum of squares	Mean squares	F value
YR	1	0.6812	0.6812	29.1803
CS	2	0.1599	0.0799	3.42504
YR * CS	2	0.0128	0.0064	0.2741
TREE (YR CS)	69	1.6107	0.0233	

It should be noted that this apparent contradiction is, in fact, not a contradiction. This is exactly what one would expect mathematically if the pecan weevil selects a nut cluster at random, and after puncturing a nut within that cluster, moves to another cluster before all of the nuts in that cluster have been punctured.

For example, in Table VI we assume a hypothetical pecan tree, and show that if the weevil attacks a constant 10% of all clusters, then there could be a variation of as much as 3.3% to 10% in the percentage of nuts punctured by the pecan weevil. If, however, the pecan weevil attacks a constant 10% of all nuts on the tree, there could be a variation of as much as 10% to 30% in the percentage of clusters punctured.

Such behavior tends to indicate that the pecan weevil does not select nuts for feeding and oviposition on the basis of nut cluster size. Data collected also supports the statement made earlier that the pecan weevil does not puncture all nuts within a multiple nut cluster before moving to another cluster.

TABLE VI

HYPOTHETICAL PECAN TREE TO ILLUSTRATE THE DIFFERENT EFFECT ON PERCENTAGE PUNCTURED CLUSTERS AND CONSTANT PERCENTAGE PUNCTURED NUTS

			Assume 10% of clusters punctured				Assume 10% of nuts punctured			
Cluster size	Number of nuts	No. of clusters	Nuts punct.	%	Clusters punct.	%	Nuts punct.	%	Clusters punct.	%
1	800	800	80	10	80	10	80	10	80	10
2	360	180	18-36	5-10	18	10	36	10	18-36	10-20
3	60	20	2-6	3.3-10	2	10	6	10	2-6	10-30

CHAPTER IV

THE DEVELOPMENT AND FEASIBILITY OF A SEQUENTIAL SAMPLING PLAN FOR THE PECAN WEEVIL

At the present time one of the better methods for determining when to spray for the pecan weevil is the use of cone emergence traps (Raney and Eikenbary 1969 and Boethel et al. 1976a, b). The traps are sensitive to the onset of weevil emergence, fluctuations in the weevil populations, and to periods of peak weevil emergence (Boethel et al. 1976a). These traps are also suited for daily monitoring of pecan weevil activity. Equations have been developed so that the number of adult weevil captured in the traps can be used to estimate the number of adult weevils in the tree (Boethel et al. 1976b). From this it is now possible for a pecan grower to determine when control measures are needed based on the number of adult weevils captured in the traps (Hedger et al. 1978 and Eikenbary et al. 1977, 1978).

Despite the apparent advantages of using the cone emergence traps for sampling, several disadvantages do exist. These include the costs and time involved in constructing, maintaining, and setting up and taking down the traps. If the orchard floor is grazed or cultivated the use of cone emergence traps may be incompatible, because the traps need to be removed to prevent them from being damaged each time the orchard is disced or mowed, or they need to be fenced off from grazing cattle. Another problem with cone emergence traps is that during periods of little or no weevil emergence this method may not give the proper estimate of weevils in the tree.

Pecan growers, especially those with small acreages or in an urban situation, need a sampling method that is inexpensive, reliable, and practical (Hammond and Pedigo 1976), because many growers will not spend the time and money to properly utilize the cone emergence trap method to sample for the pecan weevil.

One technique that has not been used for sampling the pecan weevil is sequential sampling, using punctured nuts as the sampling unit.

Sequential sampling was developed during WWII for use in quality control of wartime production (Wald 1945). According to Pieters (1978), the first use of sequential sampling in entomology was in the area of forest entomology. Stark (1952), Ives (1954), Morris (1954), and Waters (1955) used sequential sampling to estimate the populations of various forest insect pests. In agricultural entomology the first use of sequential sampling occurred during the 1960's (Pieters 1978).

The primary advantage of sequential sampling is that it allows the sampler to rapidly classify insect populations that are either of low or high density without a fixed sample number size (Oakland 1950, Morris 1954, Mason 1969, Tostowaryk and McCleod 1972, and Pieters 1978). Other advantages include a reduction in average sampling time of up to 50% (Wald 1945), predetermined accuracy and a wide range of economic injury levels which can be incorporated into the sequential sampling plans (Onsager 1976).

The purpose of this study was to determine the feasibility of using a sequential sampling plan, using punctured nuts as the sampling unit, to determine when it is necessary to make insecticide applications for control of the pecan weevil.

Methods and Materials

Two sampling methods, a modified form of sequential sampling, and the cone emergence trap method were assigned randomly to each tree. Five trees of the cultivar "Stuart" were sampled for nuts punctured by the pecan weevil using sequential sampling and five trees of the cultivar "Stuart" were sampled for adult pecan weevils using cone emergence traps. Trees were selected on the basis of having high populations of the pecan weevil and its apparent resistance to pecan scab, Fusicladium effusum (Wint.).

The sequential sampling plan was based on equations given by Waters (1955) for the binomial distribution. This distribution was selected since treatment decisions would be based on whether or not a nut was punctured. The upper and lower limits (m_2 and m_1) were arbitrarily set at 5% and 3% respectively. The assigned risks (α and β) were both set at 0.10.

The equation for computing the lower decision line is:

$$d_1 = bn - h_1$$

and the equation for computing the upper decision is:

$$d_2 = bn + h_2$$

Where:

d_1, d_2 = cumulative number of nuts punctured

n = number of samples

b = slope of the line

h_1, h_2 = V - intercepts

For calculation of the slope and intercepts the following formulas were used:

$$b = \frac{\log\left(\frac{1-m_1}{1-m_2}\right)}{\log\left[\left(\frac{m_2}{m_1}\right)\left(\frac{1-m_1}{1-m_2}\right)\right]}$$

$$h_1 = -\frac{\log\left(\frac{1-\alpha}{\beta}\right)}{\log\left[\left(\frac{m_2}{m_1}\right)\left(\frac{1-m_1}{1-m_2}\right)\right]}$$

$$h_2 = \frac{\log\left(\frac{1-\beta}{\alpha}\right)}{\log\left[\left(\frac{m_2}{m_1}\right)\left(\frac{1-m_1}{1-m_2}\right)\right]}$$

Where:

m_1 = lower limit

m_2 = upper limit

α, β = assigned risks

Once the slope and intercepts have been determined, values for n were put into the equations, and the decision lines were computed for the upper and lower limits (Fig. 1). For use in the Field a tabular version of this graph was used (Table VII).

When the study was initiated it was decided to tag a fixed number of nuts per tree and take samples from these nuts. If the pecans were not tagged it would be possible, once a treatment was made, to sample from nuts that were used to make the previous treatment decision. If nuts were sampled, found to be punctured, and removed from the tree there may not be enough nuts left at a later date to sample, and undamaged nuts may also be removed. By tagging it is possible to

Fig. 1. Sequential Sampling Chart for the Pecan Weevil Using Punctured Nuts as the Sampling Unit

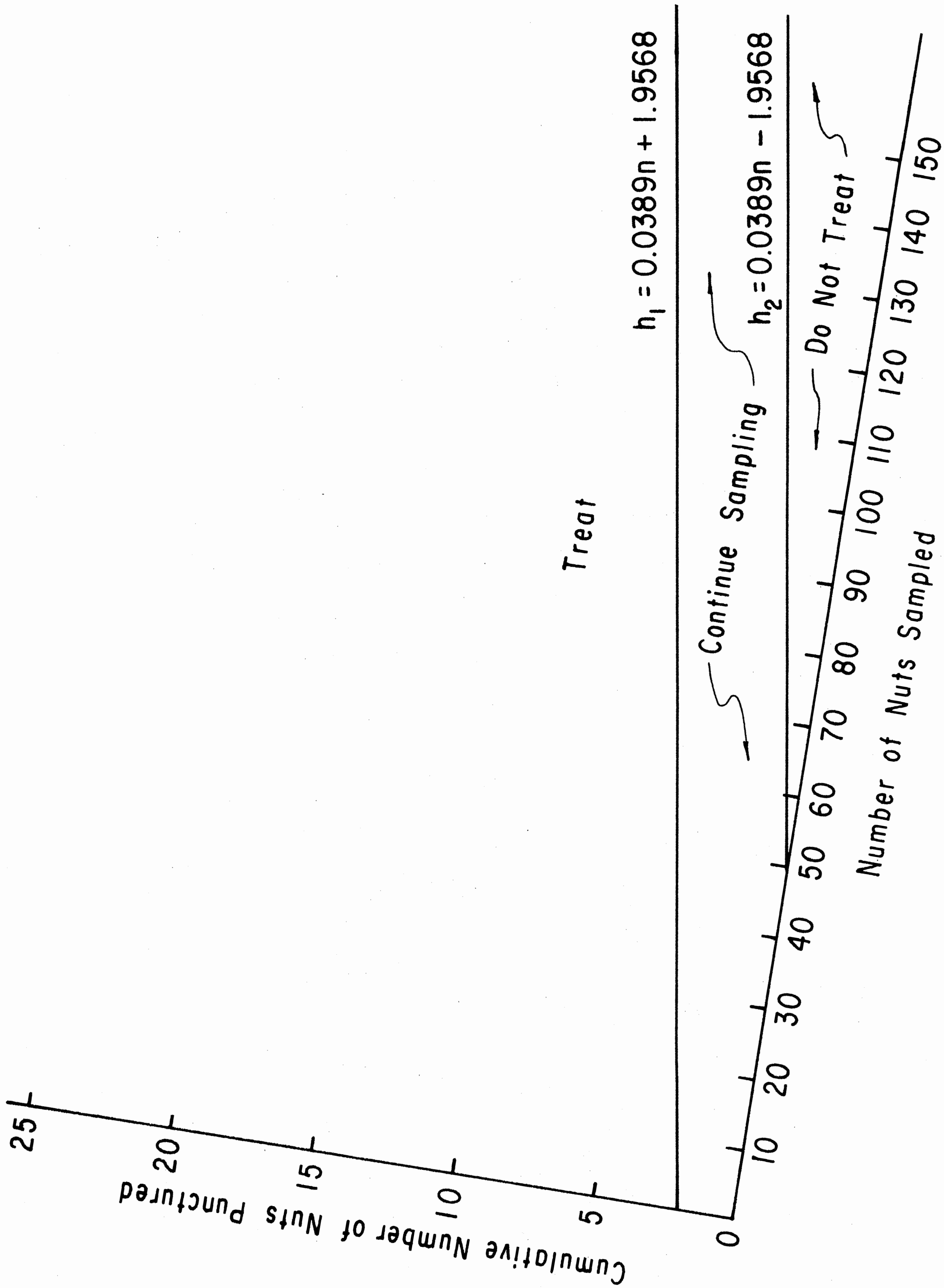

Treat
$h_1 = 0.0389n + 1.9568$
Continue Sampling
$h_2 = 0.0389n - 1.9568$
Do Not Treat
Cumulative Number of Nuts Punctured
0
5
10
15
20
25
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Number of Nuts Sampled

TABLE VII

SEQUENTIAL TABLE FOR SAMPLING PECAN WEEVIL DAMAGE

					Cumulative Number of Damaged Nuts						
Nut No.	Lower Limit	Running Total	Upper Limit	Nut No.	Lower Limit	Running Total	Upper Limit	Nut No.	Lower Limit	Running Total	Nut Limit
1	ND	____	2	50	ND	____	4	100	2	____	6
5	ND	____	2	55	1	____	4	105	2	____	6
10	ND	____	2	60	1	____	4	110	2	____	6
15	ND	____	3	65	1	____	4	115	3	____	6
20	ND	____	3	70	1	____	5	120	3	____	7
25	ND	____	3	75	1	____	5	125	3	____	7
30	ND	____	3	80	1	____	5	130	3	____	7
35	ND	____	3	85	2	____	5	135	3	____	7
40	ND	____	4	90	2	____	5	140	3	____	7
45	ND	____	4	95	2	____	6	145	4	____	8
								150	4	____	8

to make an accurate assessment of the number of nuts punctured at each sample date. Thus, only the number of new nuts punctured at each sample date is used to make a decision to treat.

Because of heavy weevil emergence in late-July and August 1977 sampling was conducted twice weekly. As weevil emergence tapered off and punctures occurred less frequently sampling was conducted at weekly intervals. Throughout 1978, sampling, due to low weevil emergence, was conducted at weekly intervals.

Although a fixed number of nuts per tree were tagged, not all nuts were required to be sampled before a decision to treat or not treat could be made. As shown in Table VII a minimum of 50 nuts has to be sampled before a decision not to treat can be made. However, only four nuts must be sampled before a decision to treat can be made. Once the treatment decision has been made the remaining tagged nuts were inspected for the presence of weevil punctures.

Treatment decisions were based on the cumulative number of nuts punctured in relation to the number of nuts sampled. If a decision was made not to treat, nuts punctured the following week would be added to the nuts punctured the previous week until a decision to treat had been made. Once a decision to treat was made all nuts punctured (including those nuts not used to make the decision) were deleted from the sample. The remaining good nuts would then compose the next sample.

The procedure for sampling trees using cone emergence traps is described by Hedger et al. (1978). The traps were checked at two-day intervals. Each tree was sprayed with carbaryl when a threshold of 40 weevils per tree was reached (Eikenbary et al. 1977). Carbaryl was considered to give control for about seven days and therefore counts were not resumed until the first weevil was trapped seven days after spraying.

Each tree was treated independently from the other and to minimize the effects of insecticide drift each study tree was encircled by eight border trees. Each tree was treated independently from the others. The border trees were treated along with the study trees. All trees used (except the border trees), regardless of sampling method, contained tagged nuts and had cone emergence traps under them. The decision to treat or not treat was determined by the sampling method assigned to that given tree and any other information collected had no influence on the treatment decision.

At shuck split the remaining tagged nuts were harvested, numbered, and taken back to the laboratory for evaluation. In addition to the tagged nuts, samples were taken from each tree for further evaluation of weevil damage.

Results and Discussion

Tables VIII and IX summarize by tree the amounts and types of damage encountered on nuts punctured by the pecan weevil. Along with this, information on trap catch and number of insecticide applications per tree are given. Further breakdown of this data is presented in Figures 2-7. Information presented in these figures include trap catch, number of nuts punctured, and number of insecticide applications made per tree, by date.

In 1977, 128 nuts were punctured by the pecan weevil on trees sampled using cone emergence traps, while 158 nuts were punctured on

TABLE VIII

SUMMARY OF PECAN WEEVIL DAMAGE BY TREE. CULTIVAR "STUART" 1977. BURNEYVILLE, OK.

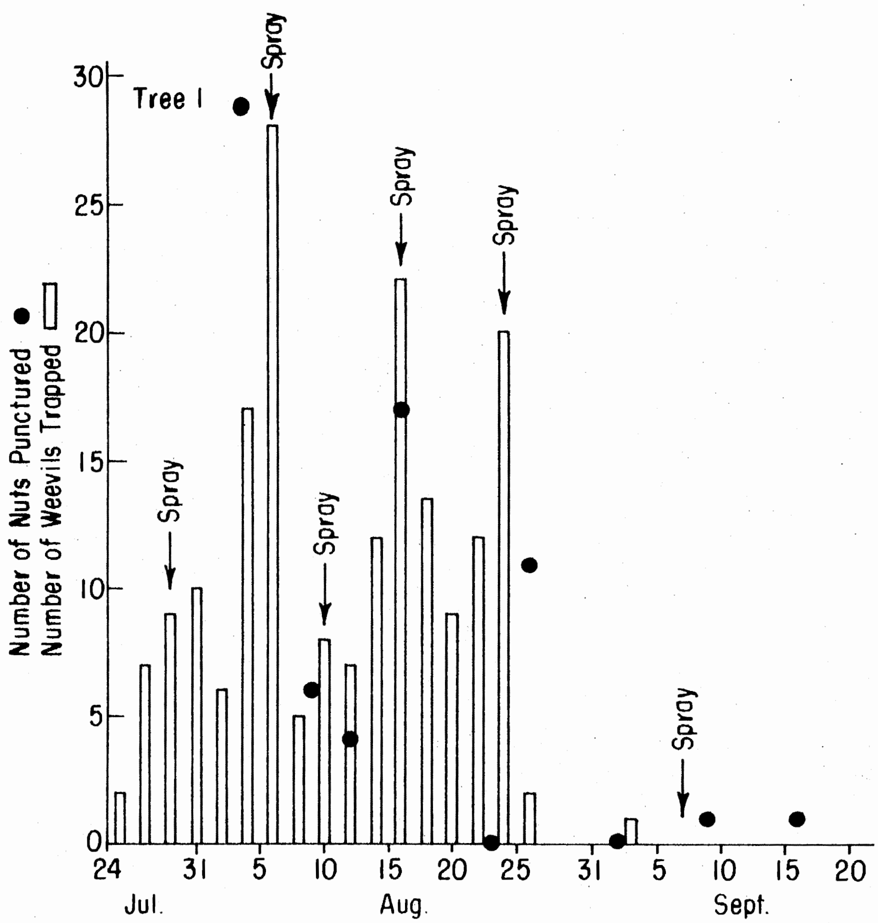
Tree Number	No. Weevils Trapped	No. Times Sprayed	No. Nuts Punctured	No. Nuts Lost Prematurely	No. Nuts with Weevil Larvae	No. Nuts with Black Spots	No. Nuts with Shriveled Kern.
1	188	6	69	40	0	1	0
3	127	5	22	8	0	0	0
5	52	4	11	5	0	0	0
7	49	3	21	6	1	1	2
10	10	1	5	2	0	0	1
Total	426	19	128	61	1	2	3
				Sequential Sampling			
2	67	4	43	27	0	0	0
4	75	2	17	4	0	0	2
6	24	4	28	8	0	0	1
8	162	3	48	22	0	2	2
9	33	3	22	13	0	1	0
Total	361	16	158	74	0	3	5

TABLE IX

SUMMARY OF PECAN WEEVIL DAMAGE BY TREE. CULTIVAR "STUART" 1978. BURNEYVILLE, OK.

Tree Number	No. Weevils Trapped	No. Times Sprayed	No. Nuts Punctured	No. Nuts Lost Prematurely	No. Nuts with Weevil Larvae	No. Nuts with Black Spots	No. Nuts with Shriveled Kern.
				Cone Emergence Traps			
1	39	3					
1	39	3	14	2	0	0	1
3	16	2	0	0	0	0	0
5	12	3	2	0	0	0	0
7[1/]	6	3	-	-	-	-	-
10	1	1	7	6	0	0	0
Total	74	13	23	8	0	0	1
				Sequential Sampling			
2	23	1	8	3	0	0	1
4	11	0	0	0	0	0	0
6	9	1	6	4	0	0	0
8	19	3	12	7	0	0	0
9	0	1	7	3	0	2	0
Total	62	7	33	17	-	2	1

Fig. 2. Number of Adult Pecan Weevil Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions Were Made Using Cone Emergence Traps. 1977.


Tree 1
Spray
Spray
Spray
Spray
Spray
Spray
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
30
25
20
15
10
5
0
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

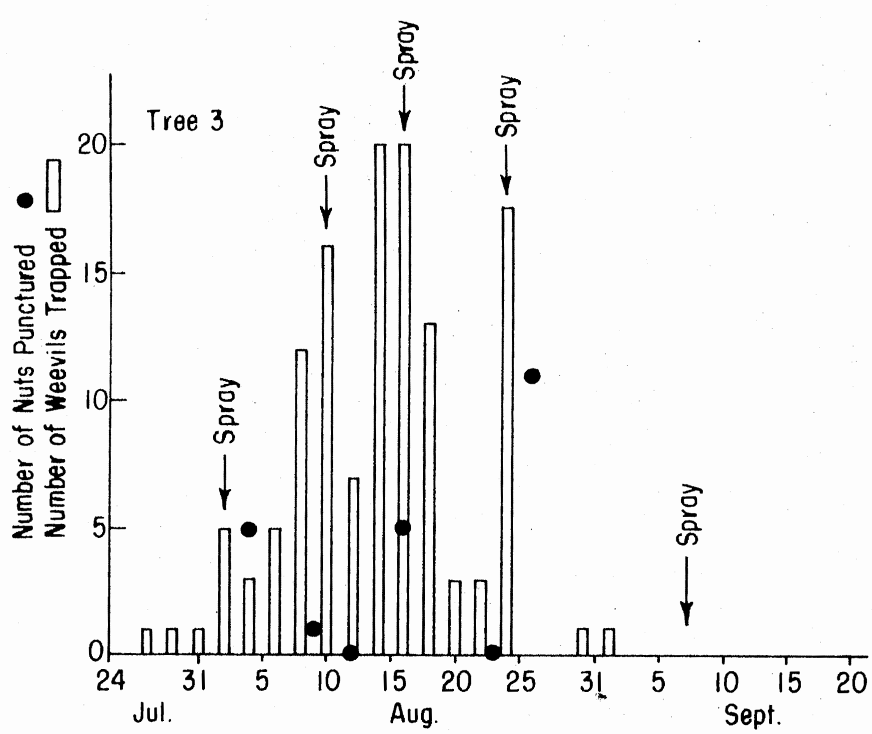
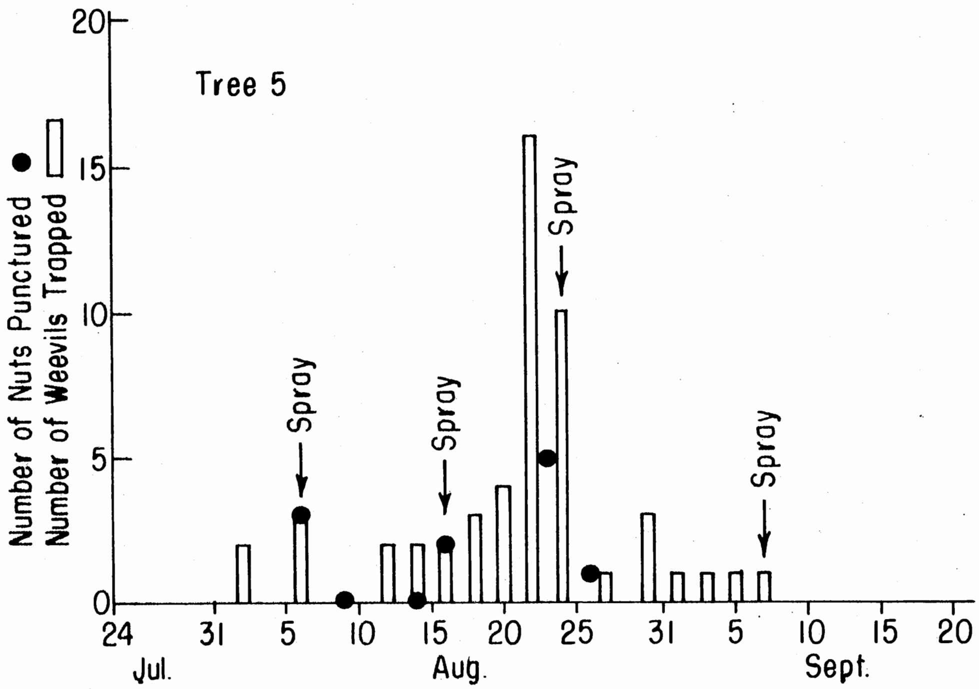
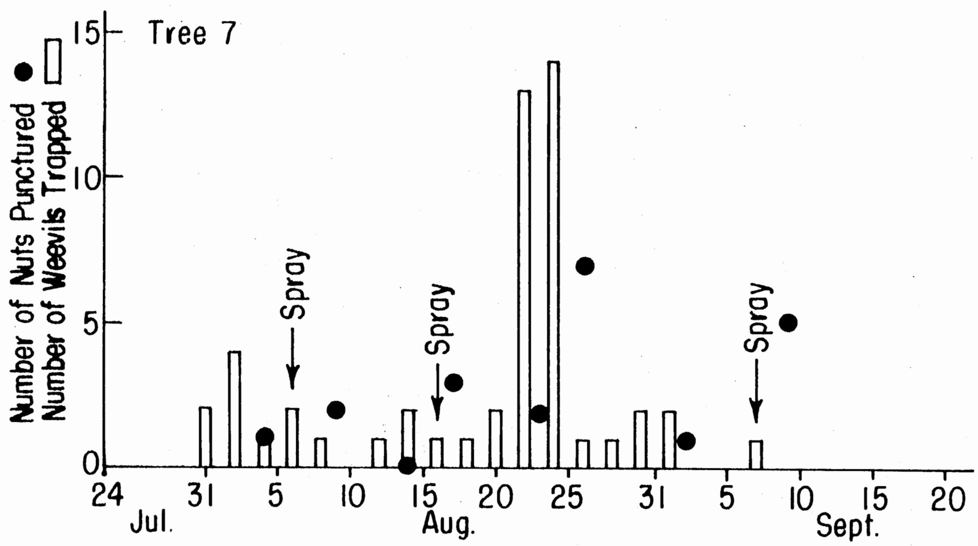

Tree 3
Spray
Spray
Spray
Spray
Spray
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
20
15
10
5
0
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

Fig. 3. Number of Adult Pecan Weevil Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions Were Made Using Cone Emergence Traps. 1977.


Tree 5
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
0
5
10
15
20
Spray
Spray
Spray
Spray
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.


Tree 7
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
0
5
10
15
Spray
Spray
Spray
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

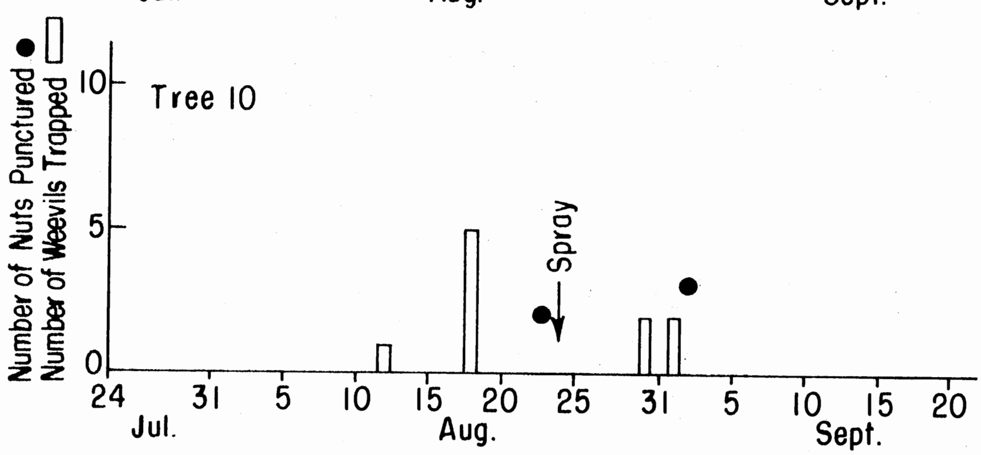
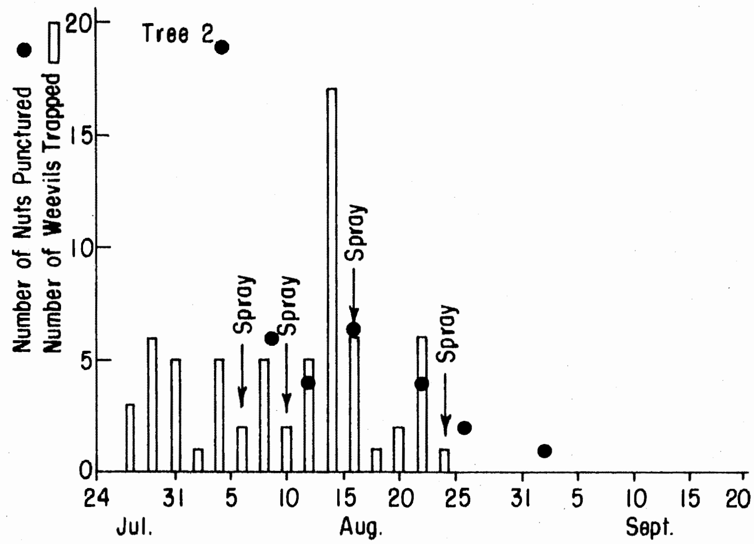
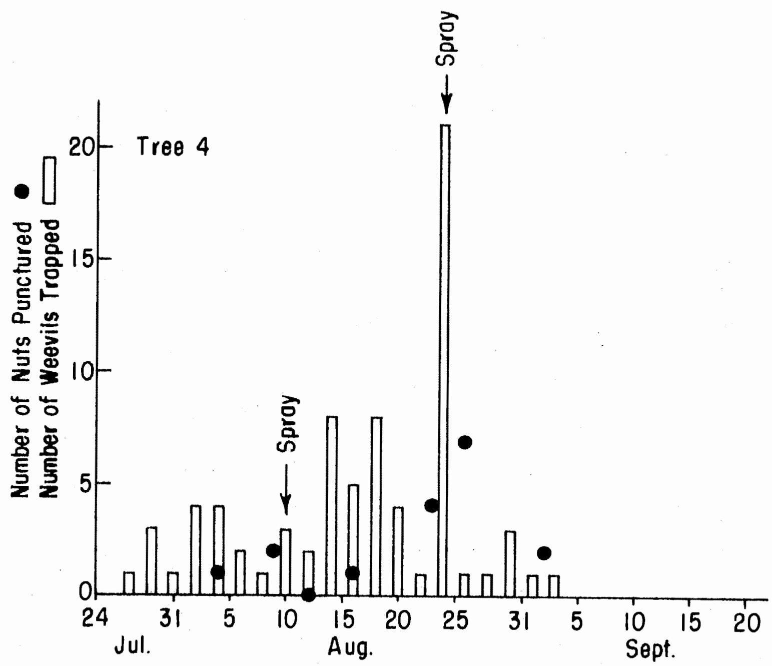

Tree 10
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
0
5
10
Spray
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

Fig. 4. Number of Adult Pecan Weevil Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions were Made Using Sequential Sampling. 1977.


Tree 2
Number of Nuts Punctured
Number of Weevils Trapped
Spray
Spray
Spray
Spray
0
5
10
15
20
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.


Tree 4
Number of Nuts Punctured
Number of Weevils Trapped
Spray
Spray
0
5
10
15
20
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

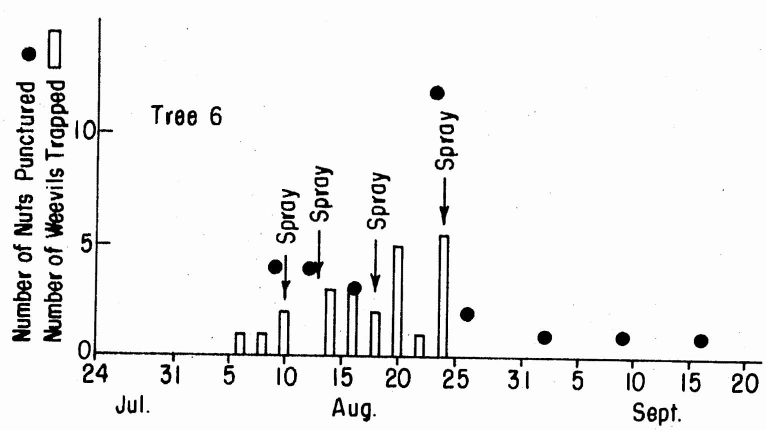
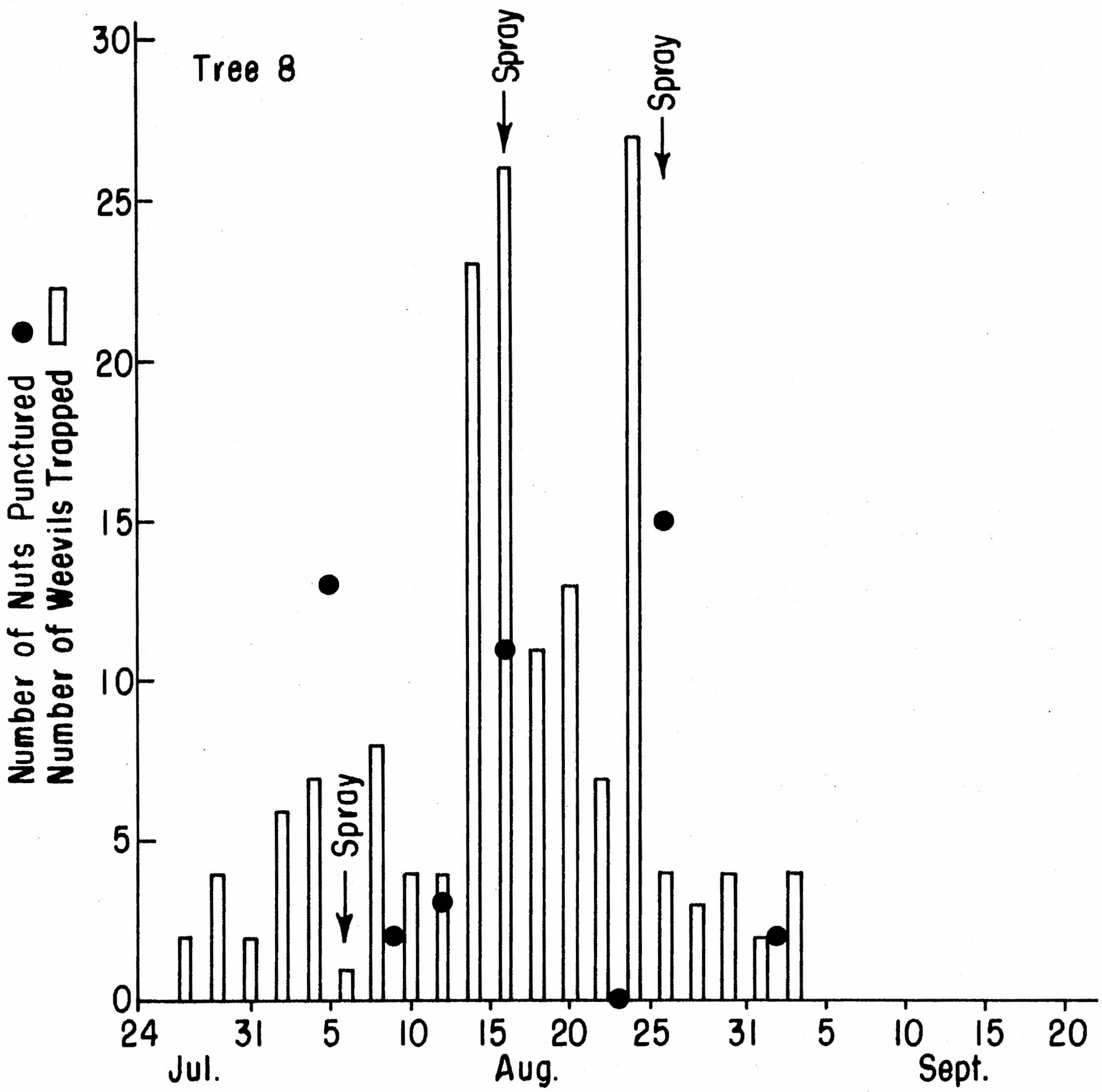

Tree 6
Number of Nuts Punctured
Number of Weevils Trapped
Spray
Spray
Spray
Spray
0
5
10
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

Fig. 5. Number of Adult Pecan Weevil Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions were Made Using Sequential Sampling. 1977.


Tree 8
Spray
Spray
Spray
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
30
25
20
15
10
5
0
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

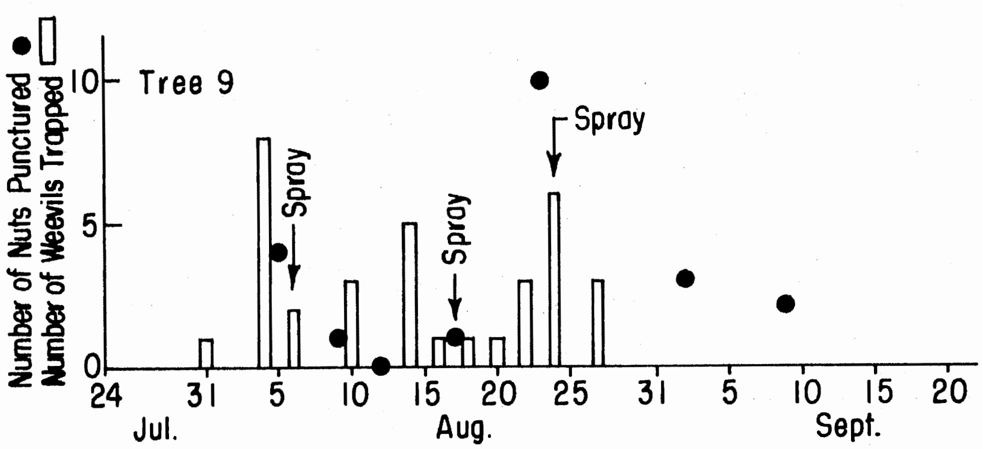
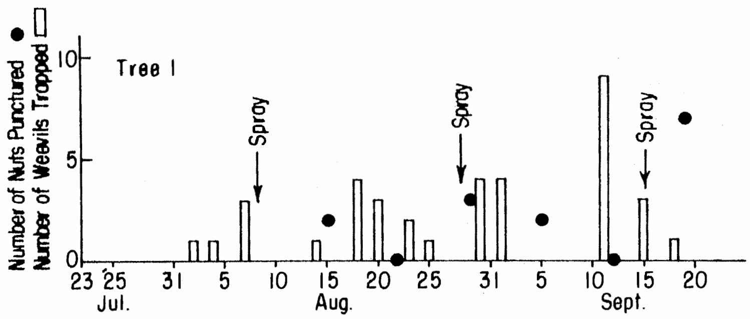
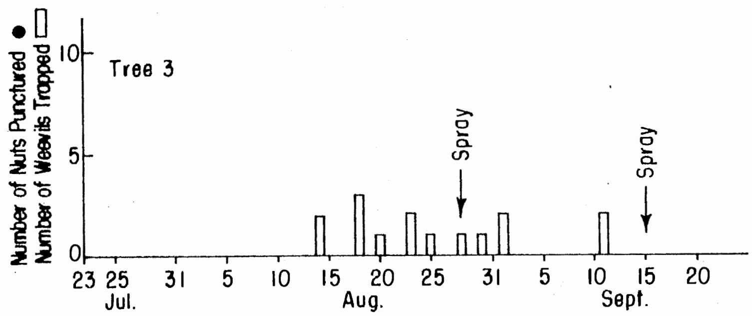
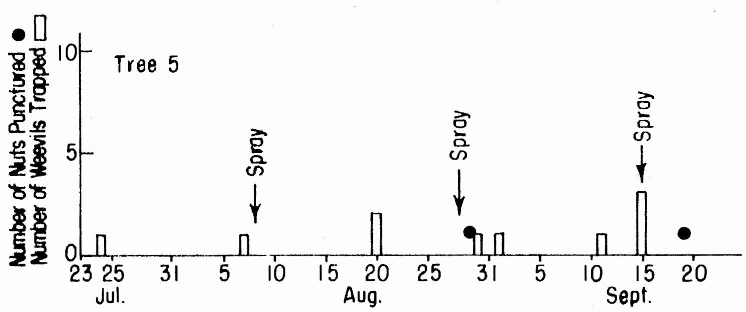
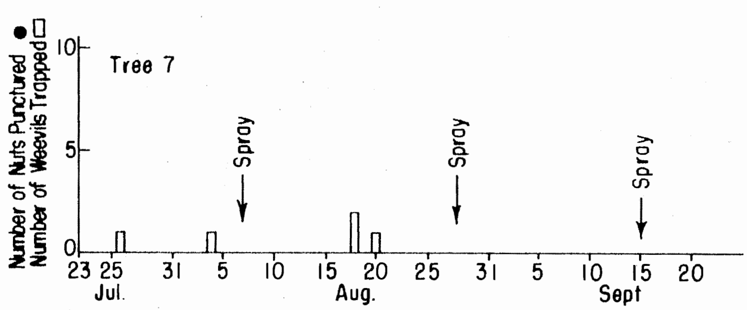

Tree 9
Spray
Spray
Spray
Number of Nuts Punctured ●
Number of Weevils Trapped ▯
10
5
0
24
31
5
10
15
20
25
31
5
10
15
20
Jul.
Aug.
Sept.

Fig. 6. Number of Adult Pecan Weevils Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions were Made using Cone Emergence Traps. 1978.


Number of Nuts Punctured ●
Number of Weevils Trapped ▯
Tree 1
Spray
Spray
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept.


Number of Nuts Punctured ●
Number of Weevils Trapped ▯
Tree 3
Spray
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept.


Number of Nuts Punctured ●
Number of Weevils Trapped ▯
Tree 5
Spray
Spray
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept.


Number of Nuts Punctured ●
Number of Weevils Trapped ▯
Tree 7
Spray
Spray
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept

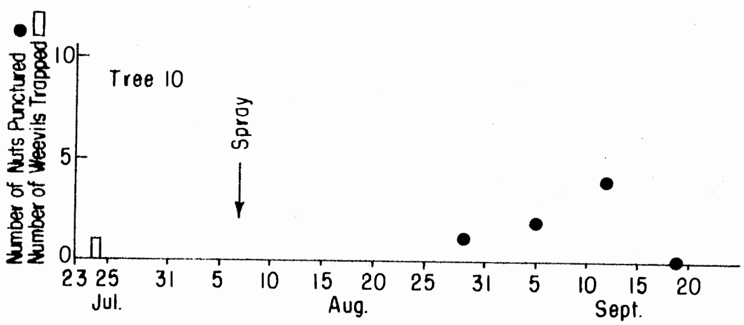
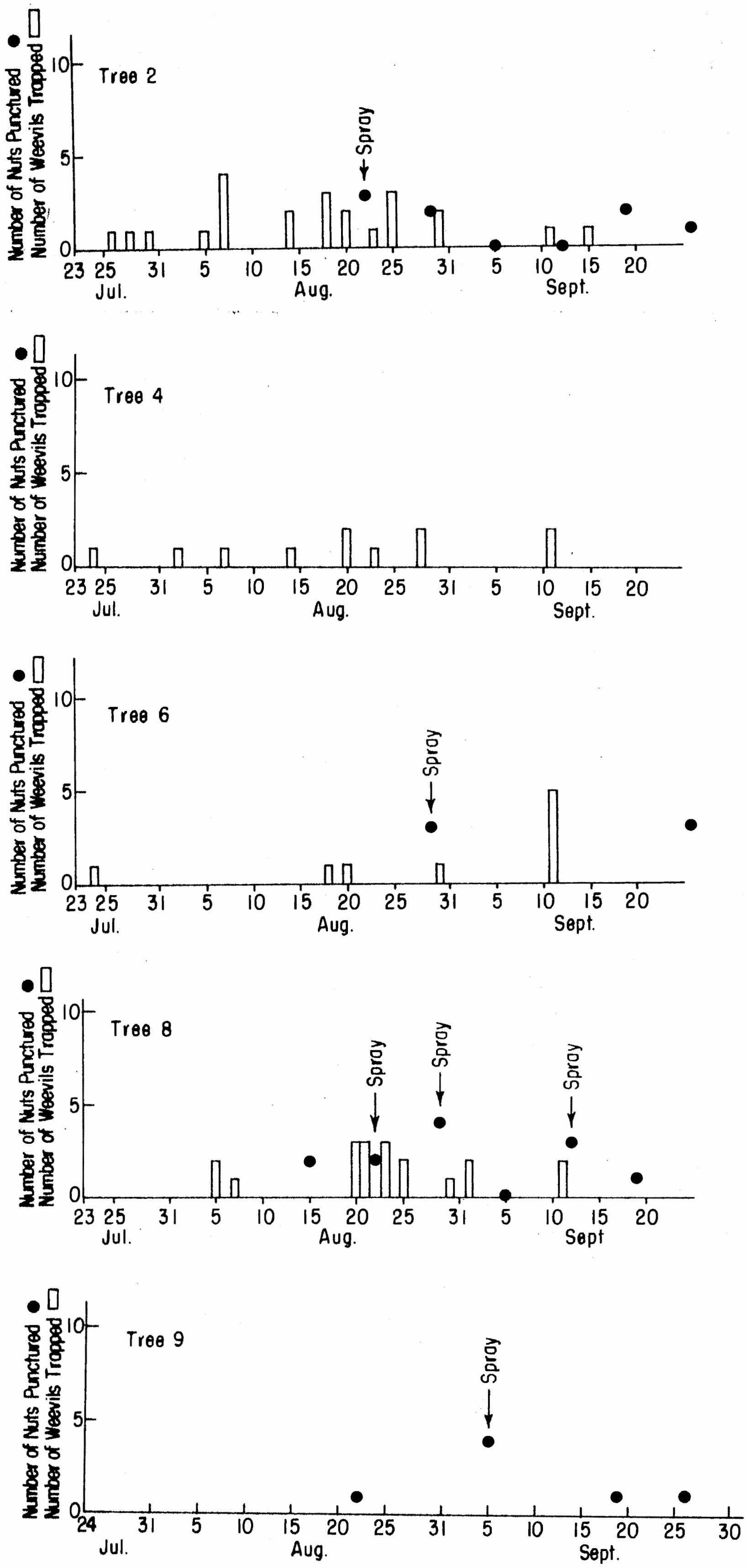

Number of Nuts Punctured ●
Number of Weevils Trapped ▯
Tree 10
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept.

Fig. 7. Number of Adult Pecan Weevil Trapped, Number of Nuts Punctured, and Number of Insecticide Applications Made by Tree and Date, for Trees in Which Treatment Decisions were Made Using Sequential Sampling. 1978.



Number of Nuts Punctured ●
Number of Weevils Trapped □
Tree 2
Spray
0
5
10
23 25 31 5 10 15 20 25 31 5 10 15 20
Jul.
Aug.
Sept.
Tree 4
Tree 6
Spray
Tree 8
Spray
Spray
Spray
Sept
Tree 9
Spray
24 31 5 10 15 20 25 31 5 10 15 20 25 30

trees sampled using sequential sampling. A total of 426 adult pecan weevils were trapped under the trees using cone emergence traps, compared to 361 trapped under the trees sampled with sequential sampling. Trees sampled using cone emergence traps were sprayed 19 times, compared to 16 times for trees sampled using sequential sampling.

In 1978, substantially fewer weevil emerged, due to the dry conditions, than in 1977. Weevil emergence totaled 74 for trees using cone emergence traps, and 62 for trees sampled using sequential sampling. As a result of reduced weevil emergence, fewer nuts were punctured. On the trees where cone emergence traps were used to time insecticide applications 23 nuts were punctured, while on trees using sequential sampling 33 nuts were punctured. The number of insecticide applications were fewer in 1978 than in 1977. Where cone emergence traps were used to determine when to treat 12 insecticide applications were made, compared to 7 times where sequential sampling was used.

The data that was collected for the two sampling methods were analyzed by using general linear modeling to predict the number of nuts punctured based on the number of weevil trapped, and the number of insecticide applications made (Tables VIII and IX).

Results of the analysis for 1977 indicates that there could possibly be some differences in the number of nuts punctured between the two sampling methods. However, there is not enough nut puncture data to determine whether the differences are statistically different.

Because of the low numbers of nuts punctured in relation to the number of nuts tagged in 1978, it was not possible to determine whether differences, if any, occurred between the two sampling methods.

Through the course of the study several advantages and disadvantages in using this particular method of sequential sampling became readily apparent.

As mentioned earlier cone emergence traps may not give the proper estimate of adult weevils in the tree. With this method of sampling, once the first weevil has been trapped, it would be possible to reach the threshold of 40 weevils per tree, without catching another pecan weevil. Even though no weevils are trapped, the equations used to estimate the number of weevils in a tree, take into account the immigration of pecan weevils from other areas in the orchard that are not covered by cone emergence traps. However, it would still be possible that the number of nuts punctured in the tree would be low enough not to warrant any treatment. For example, in 1978, tree 3 was sprayed twice and tree 5 was sprayed three times. The number of nuts punctured on tree 3 was zero, while on tree 5 only two nuts were punctured. If sequential sampling had been used instead of, or in conjunction with cone emergence traps, these trees would not have been sprayed.

By using sequential sampling in conjunction with the cone emergence traps during periods of low emergence, a grower would be able to more accurately assess the amount of pecan weevil damage that has occurred. Therefore, the grower would be able to determine more precisely when to make an insecticide application.

Another advantage found in using this sequential sampling plan was the opportunity to detect and assess other types of insect and disease damage, in particular the hickory shuckworm, pecan nut casebearer, and pecan scab. Sequential sampling also provides the grower with an opportunity to assess the various types of pecan weevil damage, especially premature not drop.

This method of sequential sampling, and any other type of sampling that uses punctured nuts as the sampling unit would be impractical to use on trees devoid of low branches (those branches that cannot be reached from the ground or from a ladder). Sampling nuts on higher branches would prove to be time consuming and expensive.

Tagging nuts also takes longer than setting up traps. Each year new tags need to be made, then nuts need to be located and tagged. It has since been found that the pecan weevil exhibits no preference for any given nut cluster size (Chapter II); therefore, nut clusters can be tagged at random. This could reduce the amount of time needed for tagging.

The amount of time needed to make a decision to treat or not treat is comparable to the time needed to make a treatment decision using cone emergence traps. However, once a decision to treat had been made, all remaining tagged nuts must be sampled to determine the total number of nuts punctured, so that these nuts can be deleted from the sample. This additional sampling would prove to be much more time consuming than checking traps (15 minutes compared to 2-5 minutes).

During years when the pecan crop is light (i.e. alternate bearing) it is possible that there will not be enough nuts to tag. Had tree 7, in 1978, been sampled using sequential sampling a lack of nuts would have prevented this sampling method to be used.

From the data, it appears that more than 150 nuts per tree need to be tagged. Because of nut loss during the sampling period there may not be enough tagged nuts left to make a treatment decision. This would be true, especially in a situation where a minimum of 50 nuts need to be sampled before a decision not to treat can be made. This was the case in 1977 for trees 1 and 2. Towards the end of the sampling period there were only 39 and 56 nuts left on each tree respectively. Thus, if more nuts need to be tagged, the additional time needed to tag and sample the nuts could be prohibitive.

Another problem encountered in using punctured nuts as the sampling unit is that it is possible for damage, in excess of the threshold limit to occur, before a decision to treat is made. This was evident in 1977 during periods of high weevil activity on trees 2, 6, 8, and 9. Because of the low numbers of nuts punctured, this was not a problem in 1978. Considering the infrequency in which samples were made, this could be the reason why more nuts were punctured on the trees where sequential sampling was used to make treatment decisions, than on trees where cone emergence traps were used to make the treatment decisions. Another possible explanation for more nuts being punctured on trees where sequential sampling was used is that, after a decision to treat was made it was usually the next day before treatments could be implemented. By the time treatments were made additional nuts could be subject to puncturing by the pecan weevil.

Using punctured nuts as a sampling unit appears to show some potential. In comparing the two sampling methods there does not appear to much difference in the number of nuts punctured. However, further research needs to be conducted to determine if this is true. It was also noted, that during periods of low weevil emergence sequential sampling can prove to be valuable in reducing the nubmer of insecticide applications needed. During both years the study was conducted, trees using sequential sampling were sprayed fewer times than the trees using cone emergence traps.

The primary disadvantage of using this method of sampling is having to tag the nuts. In the long run, more time is needed to tag and evaluate nuts, than is needed to set up and check the cone emergence traps. And, if the trees do not have any low branches this method of sampling cannot be used. It was also observed, that during periods of high weevil activity, especially if sampling is done infrequently, that the threshold limits can easily be exceeded before treatments are made.

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APPENDIX A

NUT DAMAGE AND NUT LOSS

DATA FOR 1977

1977 APPENDIX A CODE

MO = Month

DA = Day

TR = Tree Number

CD = Card Number

Card Number 1 = Nuts 01-25

2 = Nuts 26-50

3 = Nuts 51-75

4 = Nuts 76-100

5 = Nuts 101-125

6 = Nuts 126-150

G = Good Nuts

F = Nuts punctured by the Pecan Weevil

L = Light Scab

M = Medium Scab

Blank = Lost nuts

Tree 11 = Tree 9

Tree 12 = Tree 10

MO DA YR	TR	CD																									
080477	01	1	F	G	F	F		F	G	G	F	G	G	G	F	G	F	G	G	F	F	F	G	G	G	G	G
080977	01	1		M					G	G		G	G	G	F	G		G	G		F		G	L	G	G	M
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081677	01	1							G	G		G		G		G		G	G				G		F	G	
082377	01	1							G	G		G		G		G		G	G				G		F	G	
082677	01	1							G	G		G		G		G		G	G				G		F	G	
090277	01	1							G	G		G		G		G		G	G				G		F	G	
090977	01	1							G	G		G		G		G		G					G		F	G	
091677	01	1							G	G		G		G		G		G					G		F	G	
092377	01	1							G	G		G		G		G		G					G		F	G	
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080977	01	2	G	G	G	L	G	G	G	G	G	F	G	F		G	G	G		G	G			G		G	G
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092377	01	2			G		G	M	F	G	G		G					G		G	G					F	
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091677	01	3	F										F	F			F	F	F				F	G		G	
092377	01	3	F										F	F			F	F	F				F	G		G	

MO DA YR	TR	CD																									
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MO DA YR	TR	CD																									
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MO DA YR	TR	CD																								
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092377	02	6			G	G	G													G	G	G	G	G	G	G	G

MO DA YR TR CD

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090277	03	3					G		F	G	G	G	G	G	G	F	F	F	G	G	G	F	G		G	G	G
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091677	03	3					G		F	G	G	G	G	G		F	F	F	G	G	G	F	G			G	G
092377	03	3					G		F	G	G	G	G	G		F	F	F	G	G	G	F	G			G	G

MO DA YR	TR	CD																									
080477	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	G	G		G	G
080977	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	G	G		G	G
081277	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	F	F	G	G		G	G
081677	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G			G	G		G	G
082377	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G			G	G		G	G
082677	03	4	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G		G			G	G		G	G
090277	03	4	G	G	G	G	G	G	F	G	G	G		G	G	G	G	G		G			G	G		G	G
090977	03	4	G	G	G	G	G	G	F	G	G	G		G				G		G			G	G		G	
091677	03	4	G	G	G	G	G	G	F	G	G	G		G				G		G			G	G		G	
092377	03	4	G	G	G	G	G	G	F	G	G	G		G				G		G			G	G		G	
080477	03	5	G	G	G	G	G	G	G	G	G		G	G	G	G	G				G		G	G	G	G	G
080977	03	5	G	G	G	G	G	G	G	G	G		G	G	G	G	G				G		G	G	G	G	G
081277	03	5	G	G	G	G	G	G	G	G	G		G	G	G	G	G				G		G	G	G	G	G
081677	03	5	F		G	G	G	G	G	G	L		G	G	G	G	G				G		G	G	G	G	G
082377	03	5	F		G	G	G	G	G	G	L		G	G	G	G	G				G		G	G	G	G	G
082677	03	5	F		F	G	F	G	G	G	L		G	G	G	G	G				G		G	G	G	G	G
090277	03	5	F		F	G	F	G	G	G	L		G	G	G	G	G				G		G	G	G	G	G
090977	03	5			F	G		G	G	G			G	G	G	G	G				G		G	G	G	G	G
091677	03	5			F	F		G	G	G			G	G	G	G	G				G		G	G	G	G	G
092377	03	5			F	F		G	G	G			G	G	G	G	G				G		G	G	G	G	G
080477	03	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	03	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	03	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	03	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		F	G	G
082377	03	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		F	G	G
082677	03	6	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G		F	G	G
090277	03	6	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G		F	G	G
090977	03	6	G	G	G	G	G	G	G	G		F	G	G	G	G	G	G	G	G	G	G	G			G	G
091677	03	6	G	G	G	G	G	G	G	G		F	G	G	G	G	G	G	G	G	G	G	G			G	G
092377	03	6	G	G	G	G	G	G	G	G		F	G	G	G	G	G	G	G	G	G	G	G			G	G

MO DA YR	TR	CD																								
080477	04	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G
080977	04	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G
081277	04	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	
081677	04	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	
082377	04	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	
082677	04	1	F	G	G	F	G	G	G	G		G	G	G	G			G	G			G	G	G	G	G	
090277	04	1	F	G		F	G	G	G	G		G	G	G	G			G	G			G	G	G	G	G	
090977	04	1	F	G		F	G	G	G	G		G	G	G	G				G			G	G	G	G	G	
091677	04	1	F	G		F	G	G	G	G		G	G	G	G				G			G	G	G	G	G	
092377	04	1	F	G		F	G	G	G	G		G	G	G	G				G			G	G	G	G	G	
080477	04	2	G	G	G	F	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	04	2	G	G	G		G		G	G	G	G	L	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	04	2	G	G	G		G		G	G	G	G			G	G	G	G	G	G	G	G		G	G	G	G
081677	04	2	G	G	G		G		G	G	G	G			G	G	G	G	G	G	G	G		G	G	F	G
082377	C4	2	G	G	G		G		G	G	G	G			G	G	G	G	G	G	G	G		G	G	F	G
082677	04	2	G	G	G		G		G	G	F	G			G	F	G	G	G	G	G			G	G		F
090277	C4	2	G	G	G		G		G	G	F	G			G	F	G	G	G	G	G			G	G		F
090977	C4	2	G	G	G		G		G	G	F	G			G	F	G	G	G	G	G			G	G		
091677	04	2	G	G	G		G		G	G	F	G			G	F	G	G	G	G	G			G	G		
092377	04	2	G	G	G		G		G	G	F	G			G	F	G	G	G	G	G			G	G		
080477	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	04	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G
082377	04	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	F
082677	04	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	
090277	04	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	
090977	C4	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	
091677	04	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	
092377	C4	3	G	G	G	G	G		G	G	G	G			G	G	G	G	G	G	F	G	G	F	G	G	

MO DA YR	TR	CD																								
080477	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G
080977	04	4	G	G	G	G	G	G	G	G	G	F	F	G	G	G	G			G	G	G	G	G	G		G
081277	04	4	G					G	G	G	G	F	F	G	G					G	G	G	G	G	G		G
081677	04	4	G					G	G	G	G	F	F	G	G					G	G	G	G	G	G		G
082377	04	4	G					G	G	G	G	F	F	G	G					G	G	G	G	G	G		G
082677	04	4						G	G	G	G	F	F	G	G					G	G	G	G	G	G		G
090277	04	4						G	G	G	G	F	F	F	G					G	G	G	G	G	G		G
090977	04	4						G	G			F		F	G					G	G	G	G	G	G		G
091677	04	4						G	G			F		F	G					G	G	G	G	G	G		G
092377	04	4						G	G			F		F	G					G	G	G	G	G	G		G
080477	04	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	04	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
081277	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
081677	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
082377	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
082677	04	5	G		G	F		G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
090277	04	5	G		G	F		G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
090977	04	5	G		G	F		G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
091677	04	5	G		G	F		G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
092377	04	5	G		G	F		G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G
080477	04	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	04	6		G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	04	6		G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	04	6		G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082377	04	6		G			G	G	G	G	F	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
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090277	04	6		G			G	G	G	F	F	G	F	G	G		G	G	G	G	G	G	G	G	G	G	G
090977	04	6		G			G	G	G	F	F	G	F	G	G		G	G	G	G	G	G	G	G	G	G	G
091677	04	6		G			G	G	G	F	F	G	F	G	G		G	G	G	G	G	G	G	G	G	G	G
092377	04	6		G			G	G	G	F	F	G	F	G	G		G	G	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																								
080477	05	1	G		G	G	G	G	F	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
080977	05	1	G		G	G	G	G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
081277	05	1	G		G	G	G	G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
081677	05	1	G		G	G	G	G		G	F	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
082377	05	1	G		G	G	G	G		G	F	G	G	G		G	G	G	G	G	G	G	G	G	G	G	
082677	05	1	G		G	G	G			G	F	G	G	G		G	G	G	G	G	G	G	G	G	G	G	
090277	05	1	G		G	G	G			G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	
090977	05	1	G		G	G	G			G		G	G	G		G	G	G	G	G	G	G	G		G	G	
091677	05	1	G		G	G	G			G		G	G	G		G	G	G	G	G	G	G	G		G	G	
092377	05	1	G		G	G	G			G		G	G	G		G	G	G	G	G	G	G	G		G	G	
080477	05	2	F	G	G	G	G		G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
080977	05	2		G	G	G	G		G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
081277	05	2		G	G		G		G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
081677	05	2		G	G		G		G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
082377	05	2		G	F		G		G		G	G	G	G	G		G	F	G	G	G	G	G	G	G	G	G
082677	05	2		G	F		G		G		G	G	G	G	G		G	F	G	G	G	G	G	G	G	G	G
090277	05	2		G	F				G		G	G	G	G	G			F	G	G	G	G	G	G	G	G	G
090977	05	2		G	F				G		G			G	G			F	G	G	G	G	G	G	G	G	G
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092377	05	2		G	F				G		G			G	G			F	G	G	G	G	G	G	G	G	G
080477	05	3	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	05	3	G	G		G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	05	3	G	G		G		G	F	G	G		G	G			G	G	G	G			G	G	G	G	G
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090277	05	3	G	G		G		G		G	G		G	G			G	F	G	G			G	G	F	G	G
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091677	05	3	G	G		G		G		G	G		G	G			G	F	G	G			G	G	F	G	G
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MO DA YR	TR	CD																									
080477	05	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	05	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	05	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
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082377	05	4	G	G	G	G	G		G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G
082677	05	4	G	G	G	G	G		G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G
090277	05	4	G	G	G				G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G
090977	05	4	G	G	G				G	G	G	G	G	F	G	G	G	G	G	G	G	G	G		G	F	G
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092377	05	4	G	G	G				G	G	G	G	G	F	G	G	G	G	G	G	G	G	G		G	F	G
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082377	05	5	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082677	05	5	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090277	05	5	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090977	05	5	G	G	G	G		G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091677	05	5	G	G	G	G		G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092377	05	5	G	G	G	G		G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080477	05	6	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	F	G	G	G
080977	05	6				G		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	F	G	G	G
081277	05	6				G		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	F	G	G	G
081677	05	6				G		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	F	G	G	G
082377	05	6				G		G	G	G	G		G	G	G	G	G	G		F	G	G	G		G	G	G
082677	05	6				G		G	G	G	G		G	G	G	G	G	G		F	G	G	G		G	G	G
090277	05	6				G		G	G	G	G		G	G	G	G	G	G		F	G	G	G				
090977	05	6						G	G	G	G		G	G	G	G	G	G		F	G	G	G				
091677	05	6						G	G	G	G		G	G	G	G	G	G		F	G	G	G				
092377	05	6						G	G	G	G		G	G	G	G	G	G		F	G	G	G				

MO DA YR	TR	CD																							
080477	06	1	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	06	1	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	06	1	G		G	G	G		G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	06	1	G		G	G	G		G	G	G	F	F	G	G	G	M	G	G	G	G	G	G	G	G	G
082377	06	1	G		G	G	G		G	G	G	F	F	F	F	G		G	G	F	G	G	G	F	F	F	F
082677	06	1	G		G	G	G		G	G	G	F	F	F	F	G		G	G	F	G	G	G	F	F	F	F
090277	06	1	G		G	G	G		G	G	G	F	F	F	F	G		G	G	F	G	G	G	F		F	F
090977	06	1	G		G	G	G		G	G	G	F	F	F	F			G	G	F	G	F	G	F		F	F
091677	06	1	G		G	G	F		G	G	G	F	F	F	F			G	G	F	G	F	G	F		F	F
092377	06	1	G		G	G	F		G	G	G	F	F	F	F			G	G	F	G	F	G	F		F	F
080477	06	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	06	2	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	06	2	G	G	M	L	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	G	G	G
081677	06	2	G	G		L			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	G	G	G
082377	06	2	F	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
082677	06	2	F	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
090277	06	2	F	G					F	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
090977	06	2	F	G					F	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
091677	06	2	F	G					F	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
092377	06	2	F	G					F	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
080477	06	3		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	06	3		F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	06	3			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	06	3			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	M
082377	06	3			G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
082677	06	3			G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
090277	06	3			G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	
090977	06	3			G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	
091677	06	3			G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	
092377	06	3			G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	

MO DA YR	TR	CD																								
080477	06	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	06	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	06	4	G	G	G	G	G	G	G	G	G	G	G	G	G	L	F	L	G	G	G	G	G	G	G	G	G
081677	06	4	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G	F	F	G
082377	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	G	G	G	F	F	G
082677	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	F	G	F	F	F	G
090277	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	F	G	F	F	F	G
090977	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	F	G	F	F	F	G
091677	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	F	G	F	F	F	G
092377	06	4	F	G	G	F	G	G	G	G	G	G	G	G	G				G	F	G	F	G	F	F	F	G
080477	06	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	06	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	G	G	G	G	G	G
081277	06	5	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	G	G	G	G	G	G
081677	06	5		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G
082377	06	5		G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
082677	06	5		G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
090277	06	5		G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
090977	06	5		G	F	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
091677	06	5		G	F	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
092377	06	5		G	F	G	G	G	G	G	G	G	G	F	G	G	G	G	G			G	G	G	G	G	G
080477	06	6	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
080977	06	6	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
081277	06	6	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
081677	06	6	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G
082377	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G
082677	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G
090277	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G
090977	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G
091677	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G
092377	06	6	G	G	G	G	G	G	G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																								
080477	07	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	07	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	07	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	07	1	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082377	07	1	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082677	07	1	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	F	G	G	G	F	G
090277	07	1	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	F	G	G	G	F	G
090977	07	1		G	G	F	G	G	G			G	G	G	G	G	G	G	F	G	G		G	G	G	F	G
091677	07	1		G	G	F	G	G	G			G	G	G	G	G	G	G	F	G	G		G	G	G	F	G
092377	07	1		G	G	F	G	G	G			G	G	G	G	G	G	G	F	G	G		G	G	G	F	G
080477	07	2	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	07	2	G	F	G	G	G	G	G	F	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	07	2	G		G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	07	2	G		G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G	G	G	G
082377	07	2	G		G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G	G	G	G
082677	07	2	G		G	G		G	G		G		G	G	G	G	G	G	G	G	G		G	G	G	G	G
090277	07	2	G		G	G		G	G		G		G	G	G	G	G	G	G	G	G		G	G	G	G	G
090977	07	2	G		G	F		G	G		G		F	G	G	G	G	G	G	G	G		G	G	G	G	G
091677	07	2	G		G	F		G	G		G		F	G	G	G	G	G	G	G	G		G	G	G	G	G
092377	07	2	G		G	F		G	G		G		F	G	G	G	G	G	G	G	G		G	G	G	G	G
080477	07	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G
080977	07	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G			G	G	G		G
081277	07	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	L		G	G			G	G	G		G
081677	07	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	L		G	G			G	G	G		G
082377	07	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G
082677	07	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G
090277	07	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G
090977	07	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G
091677	07	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G
092377	07	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G			G	G			G	G	G		G

MO DA YR	TR	CD																								
080477	07	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	07	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	07	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G
081677	07	4	G	G	G	G	G	G	F	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G		G
082377	07	4	G	G	G	G	G	G	F	G	G	F	G	G	G	G	G	G	G	G	G	G	F	G	G		G
082677	07	4	G	F	G	G	G	G	F	G	F		F	G	G	G	G	G	G	G	G	G	F	G	G		
090277	07	4	G	F	G	G	G	G	F	G	F		F	G	G	G	G	G	G	G	G	G	F	G	G		
090977	07	4	G	F	G	G	G			G	F		F	G	G	G	G	G	G	G	G	G	F	G			
091677	07	4	G	F	G	G	G			G	F		F	G	G	G	G	G	G	G	G	G	F	G			
092377	07	4	G	F	G	G	G			G	F		F	G	G	G	G	G	G	G	G	G	F	G			
080477	07	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	07	5	G	G	G	G	G	G	G	G	G	G	G	G			G	G	F	G	G	G	G	G	G	G	G
081277	07	5	G	G	G	G	G	G	G	G	G	G		G			G	G	F	G	G	G	G	G	G	G	G
081677	07	5	G	G	G	G	G	G	G	G	G	G		G			G	G		G	G	G	G	G	G	G	G
082377	07	5	G	G	G	G	G	G	G	G	G	G		G			G	G		G	G	G	G	G	G	G	G
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090277	07	5	G	G	G	G	G	G	G	G	G			G			G	G		G	G	G	G	G	G	G	G
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092377	07	5	G	G	G	G	G	G	G	G	G			G			G	G		G	G	G	G	G	G	G	G
080477	07	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	07	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
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081677	07	6	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	
082377	07	6		F	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G		G	G	G	G	G	G	
082677	07	6		F	G	G	G	G	G	G	F	G	G	G	G	G	G	F			G	G	G	G	G	F	
090277	07	6		F	G	G	G	G	G	G	F	G	G	G	G	G	G	F			G	G	G	G	G	F	
090977	07	6		F	G	G	G	G	G	G		G	F	G	G	G	G	F			G	G	G	G	G	F	
091677	07	6		F	G	G	G	G	G	G		G	F	G	G	G	G	F			G	G	G	G	G	F	
092377	07	6		F	G	G	G	G	G	G		G	F	G	G	G	G	F			G	G	G	G	G	F	

MO DA YR	TR	CD																								
080477	08	1	G	G	G	G	G	G	F		G	G	G	G	G	G	F	G	G	G	G	G	G	G	G		G
080977	08	1	G	G	G	G	G	G			G	G	G	G	G	G	F	G	G	G	G	G	G	G	G		G
082377	08	1	F	G		G	G	G			M	G	G	L	G	G		G	G		G	F	G	G	G		G
081677	08	1	F	G		G	G	G			M	G	G	L	G	G		G	G		G	F	G	G	G		G
081277	08	1	G	G	G	G	G	G			G	G	G	G	G	G		G	G	L	G	G	G	G	G		G
082677	08	1	F	G		G	G	G			M	G	G	L	F	G		G	G		G		G	G	F		G
090277	08	1	F	G		G	G	G			M	G	G	L	F	G		G	G		G		G	G	F		G
090977	08	1	F	G		G	G	G				G	G		F	G		G			G		G	G	F		
091677	08	1	F	G		G	G	G				G	G		F	G		G			G		G	G	F		
092377	08	1	F	G		G	G	G				G	G		F	G		G			G		G	G	F		
080477	08	2	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	
080977	08	2	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	F	G	G	G	
081277	08	2	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	F	G	G	G	
081677	08	2	G	F		G	G	G	G	F	G	G	G	G		G	G	L	G	G	G	G	F	G	G	G	
082377	08	2	G	F		G	G	G	G	F	G	G	G	G		G	G	L	G	G	G	G		G	G	G	
082677	08	2	G	F		G	F	G	G			G	G	F		F	F	L	F	G	G	F		G	F	F	
090277	08	2	G	F		G	F	G	G			G	G	F		F	F	L	F	G	G	F		G	F	F	
090977	08	2	G			G	F	G				G	G	F		F	F		F	G	G	F		G		F	
091677	08	2	G			G	F	G				G	G	F		F	F		F	G	G	F		G		F	
092377	08	2	G			G	F	G				G	G	F		F	F		F	G	G	F		G		F	
080477	08	3	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	F	G	F	G	G	G	G	G
080977	08	3	G				G	G			G	G	G	G	G	G	G	G			G	F	G	G	G	G	G
081277	08	3	G				G	G			G	G	G	G	G	G	G	G			G	F	G	G	G	G	G
081677	08	3	G				F	G			G	G	G	G	G	G	G	G			G		G	G	F	G	G
082377	08	3	G				F	G			G	G	G	G	G	G	G	G			G		G	G	F	G	G
082677	08	3	G				F	G			G	G	F	G	G	F	G	G			G		G	G		G	G
090277	08	3	G				F	G			G	G	F	G	G	F	G	G			G		G	G		G	G
090977	08	3					F	G			G	G	F	G	G	F	G	G			G		G	G		G	G
091677	08	3					F	G			G	G	F	G	G	F	G	G			G		G	G		G	G
092377	08	3					F	G			G	G	F	G	G	F	G	G			G		G	G		G	G

MO DA YR	TR	CD																									
080477	08	4	G	G	G			G		G	G	G	G	G	G	G	F	F	G	G	G	G	G	G	G	G	F
080977	08	4	G	G	G			G		G	G	G		G	G	G		F		F	G	G	G	G	G	G	F
081277	08	4	G	G	G			G		G	G	G		G	G	G		F			G	G	G	G	G	G	F
081677	08	4	F	G	G			G		G	G	F		G	G	G		F			G	G	G	G	G	G	F
082377	08	4	F	G	G			G		G	G	F		G	G	G		F			G	G	G	G	G	G	F
082677	08	4	F	G	G			G		G	G	F		G	G	G		F			G	G	G	G	G	G	F
090277	08	4	F	G	G			G		G	G	F		G	G	G		F			G	G	G	F	G	G	
090977	08	4		G	G			G		G	G	F		G	G	G					G	G	G	F	G	G	
091677	08	4		G	G			G		G	G	F		G	G	G					G	G	G	F	G	G	
092377	08	4		G	G			G		G	G	F		G	G	G					G	G	G	F	G	G	
080477	08	5	G	G	G	G	F	F	G	G	G	G	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	08	5	G	G	G		F	F	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G
081277	08	5	G	G	G				G	F		G			F	G	F	G	G	G	G	G	G	G	G	G	G
081677	08	5	G	G	G				F	F		G			F	G	F	G	G	G	G	G	G	G	G	G	G
082377	08	5	G	G	G				F	F		G			F	G	F	G	G	G	G	G	G	G	G	G	G
082677	08	5	G	G	G				F	F		F			F	G	F	G	G	G	F	G	G	G	G	G	G
090277	08	5	G	G	F				F	F		F			F	G	F	G	G	G		G	G	G	G	G	G
090977	08	5	G	G	F							F			F	G		G	G	G		G	G	G	G	G	G
091677	08	5	G	G	F							F			F	G		G	G	G		G	G	G	G	G	G
092377	08	5	G	G	F							F			F	G		G	G	G		G	G	G	G	G	G
080477	08	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	08	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	08	6	G	G	G	G	L	G	G	G	G	L	L	L	L	G	G	G	G	G	G	G	G	G	G	G	G
081677	08	6	G	G	G	G	L	F	G	G	G	L		L	L	G	G	G	G	G	F	G	G	G	G	G	G
082377	08	6	G	G	G	G	L	F	G	G	G	L		L	L	G	G	G	G	G	F	G	G	G	G	G	G
082677	08	6	G	G	G	G	L	F	G	G	G	L		L	L	F	F	F	G	G	F	G	G	G	G	G	G
090277	08	6	G	G	G	G	L	F	G	G	G	L		L	L	F	F	F	G	G	F	G	G	G	G	G	G
090977	08	6		G	G			F	G	G	G	L		L	L	F	F	F	G			G	G	G	G	G	G
091677	08	6		G	G			F	G	G	G	L			L	F	F	F	G			G	G	G	G	G	G
092377	08	6		G	G			F	G	G	G	L			L	F	F	F	G			G	G	G	G	G	G

MO DA YR	TR	CD																									
080477	11	1		G	G	G	G	G	G	G	G	G					G				G	G	G	G	G	G	G
080977	11	1		G	G	G	G	G	G	G		G					G				G	G	F	G	G	G	G
081277	11	1		G	G	G	G	G	G	G		G					L				G	G		G	G	G	G
081677	11	1		G	G	G	G		G	G		G									G	G		G	G	G	
082377	11	1		G	G	F						G										G		G	G	G	
C82677	11	1		G	G	F						G										G		G	G	G	
090277	11	1		G	G							G										G		G	G	G	
090977	11	1		G	G							G										G		G	F	G	
091677	11	1		G	G							G										G		G	F	G	
092377	11	1		G	G							G										G		G	F	G	
080477	11	2	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G		G	G	G	G
080977	11	2	G	G		G	G	G	G	G	G	G	G	G	G				G	G	G	G		G	G		G
081277	11	2	G	G		G	G	G	G	G	G	G	G	G	G				G	G	G	G		G	G		
081677	11	2	G	G		G	G	G	G	G	G	G	G	G	G				F	G	G	G		G	G		
082377	11	2	G	G		G	G			G	G	G	F	G	G					G	G	G		G	G		
082677	11	2	G	G		G	G			G	G	G	F	G	G					G	G	G		G	G		
090277	11	2	G			G	G			G	G	G	F	G	G					G	F	G		G	G		
090977	11	2	G			G	G			G	G	G	F	G	G					F	F	G		G	G		
091677	11	2	G			G	G			G	G	G	F	G	G					F	F	G		G	G		
092377	11	2	G			G	G			G	G	G	F	G	G					F	F	G		G	G		
C80477	11	3			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	F	G	G		G	G	G
080977	11	3			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G		G	G	G
081277	11	3			L	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G		G	G	G
081677	11	3			L	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G		G	G	G
082377	11	3			L	G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G
082677	11	3			L	G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G
090277	11	3				G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G
090977	11	3				G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G
091677	11	3				G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G
092377	11	3				G	G	G	G	G	G	G	G	G		F	F	G	F				F		G	G	G

MO DA YR	TR	CD																								
080477	11	4	G	G	G	G	G	G	G	G			F	F	F	G		G	G	G	G				G	G	G
080977	11	4	G	G	G	G	G	G	G	G						G		G	G	G	G				G	G	G
081277	11	4	G	G	G	G	G	G	G	G						G		G	G	G	G				G	G	G
081677	11	4	G	G	G	G	G	G	G	G						G		G	G	G	G				G	G	G
082377	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
082677	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
090277	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
090977	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
091677	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
092377	11	4	G	G	G	G	F	G	G	G						G		G	G	G	G				G	G	G
080477	11	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G										G
080977	11	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G										G
081277	11	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G										G
081677	11	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G										G
082377	11	5					G	F	G	F	F	G		G	G	F	G										G
082677	11	5					G	F	G	F	F	G		G	G	F	G										G
090277	11	5					F	F	G	F	F	G		F	G	F	G										G
090977	11	5					F	F	G	F	F	G		F	G	F	G										G
091677	11	5					F	F	G	F	F	G		F	G	F	G										G
092377	11	5					F	F	G	F	F	G		F	G	F	G										G
080477	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G
081277	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
081677	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
082377	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
082677	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
090277	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
090977	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
091677	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
092377	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		

MO DA YR	TR	CD																									
080477	12	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G
080977	12	1		G	G	G	G		G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G
081277	12	1		G	G	G	G		G	G	G	G	G		G	G		G	G	G	G	G	G	G	G	G	G
081677	12	1		G	G	G	G		G	G	G	G	G		G	G		G	G	G	G	G	G	G	G	G	G
082377	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
082677	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
090277	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
090977	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
091677	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
092377	12	1		G	G	G	G		G	F	G	G	G		G	G		G	G	G	G	G	G	G		G	G
080477	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
080977	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
081277	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
081677	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
082377	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
082677	12	2	G		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
090277	12	2	G		G	G	G		G	G	G	G	G	G	G	F	G	G		G	G	G		G	G	G	G
090977	12	2	G		G	G	G		G	G	G	G	G	G	G	F	G	G		G	G	G		G	G	G	G
091677	12	2	G		G	G	G		G	G	G	G	G	G	G	F	G	G		G	G	G		G	G	G	G
092377	12	2	G		G	G	G		G	G	G	G	G	G	G	F	G	G		G	G	G		G	G	G	G
080477	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
080977	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G		G
081277	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G		G
081677	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G			G
082377	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G			G
082677	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G			G
090277	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G		G	G	G	G	G	G			G
090977	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G		G	G	G	G	G	G			G
091677	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G		G	G	G	G	G	G			G
092377	12	3	G	G	G	G	G	G		G	G	G	G		G	G	G		G	G	G	G	G	G			G

MO DA YR	TR	CD																								
080477	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082377	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082677	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090277	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090977	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091677	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092377	12	4	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080477	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082377	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
082677	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
090277	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
090977	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
091677	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
092377	12	5	G	G	G		G	G	G	G	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	G	G
080477	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
080977	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081277	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081677	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082377	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082677	12	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090277	12	6	G	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090977	12	6	G	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091677	12	6	G	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092377	12	6	G	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

APPENDIX B

NUT DAMAGE AND NUT LOSS DATA FOR 1978

1978 APPENDIX B CODE

MO = Month

DA = Day

TR = Tree Number

CD = Card Number

Card Number 1 = Nuts 01-25

2 = Nuts 26-50

3 = Nuts 51-75

4 = Nuts 76-100

5 = Nuts 101-125

6 = Nuts 126-150

G = Good Nuts

P = Nuts punctured by the Pecan Weevil

C = Nuts damaged by the Pecan Nut Casebearer

Blank = Lost Nuts

Tree 11 = Tree 9

Tree 12 = Tree 10

MO DA YR	TR	CD																								
081578	01	1	G	G	G	G	G	P	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	01	1	G	G	G	G	G	P	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	01	1	G		G	G	G		G		G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G
090578	01	1	G		G	G	G		G		G	G	G	G	G	G	G	P	G	G		G	G	G	G	G	G
091278	01	1	G		G	G	G		G		G	G	G	G	G	G	G	P	G	G		G	G	G	G	G	G
091978	01	1	G		G	G	G		G		G	G	G	G		G	G	P	G	G		G	G	G	G	G	G
092678	01	1	G		G	G	G		G		G	G	G	G		G	G	P	G	G		G	G	G	G	G	G
101078	01	1	G		G	G	G		G		G	G	G	G		G	G	P	G	G		G	G	G	G	G	G
081578	01	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		P	G	G
082278	01	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		P	G	G
082978	01	2	G	G	G			G	G	G		G	G	G	G	G	G	G			G					G	G
090578	01	2	G	G	G			G	G	G		G	G	G	P	G	G	G			G					G	G
091278	01	2	G	G	G			G	G	G		G	G	G	P	G	G	G			G					G	G
091978	01	2	G	G	G			G	G	G		G	G	G	P	G	G	G			G					G	G
092678	01	2	G	G	G			G	G	G		G	G	G	P	G	G	G			G					G	G
101078	01	2	G	G	G			G	G	G		G	G	G	P	G	G	G			G					G	G
081578	01	3	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	01	3	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	01	3	G		G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G		G
090578	01	3	G		G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G		G
091278	01	3	G		G	G	G	G	G	G			G	G		G	G	G	G	G	G	G	G	G	G		G
091978	01	3	G		G	P	G	G		P			G	G		G	G	G	G	G	P	G	G	P	G		G
092678	01	3	G		G	P	G	G		P			G	G		G	G	G	G	G	P	G	G	P	G		G
101078	01	3	G		G	P	G	G		P			G	G			G	G	G	G	P	G	G	P	G		G

MO DA YR	TR	CD																										
081578	01	4	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
082278	01	4	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
082978	01	4	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
090578	01	4	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
091278	01	4	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
091978	01	4	G	G		G	P	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
092678	01	4	G	G		G	P	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
101078	01	4	G	G		G	P	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
081578	01	5	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	01	5	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	01	5	G	G	G	G	P	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	01	5	G	G	G	G	P	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	01	5	G	G	G	G	P	G	G	G	G				G	G	G	G	G	G	G	G	G	G	G	G	G
091978	01	5	G	G	G	G	P	G	G	G	G				G	G	G	G	G	G	G	G	G	G	G	G	P
092678	01	5	G	G	G	G	P	G	G	G	G				G	G	G	G	G	G	G	G	G	G	G	G	P
101078	01	5	G	G	G	G	P	G	G	P	G				G	G	G	G	G	G	G	G	G	G	G	G	P
081578	01	6	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	01	6	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	01	6	G	G	G	G	G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G
090578	01	6	G	G	G	G	G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G
091278	01	6	G	G	G		G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G
091978	01	6	P	G	G		G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G
092678	01	6	P	G	G		G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G
101078	01	6	P	G	G		G	G	G	G	G		G	G	P	G	G	P	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																									
081578	C2	1	G	G	G	G		G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G
082278	02	1	G	G	G	G		G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G
082978	02	1	G	G	G	G		G	G	G	G	G	G	G	G		G		G	G		G		P	P	G	G
090578	C2	1	G	G	G	G		G	G	G	G	G	G	G	G		G		G	G		G			P	G	G
091278	02	1	G	G	G	G		G	G	G	G	G	G	G	G		G		G	G		G			P	G	G
C91978	02	1	G	G	G	G		G	G	G	G	G	G	G	G		G		G	G		G			P	G	G
092678	02	1	G	G	G	G		G	G	G	G	G	G	G	G		G			G		G			P	G	G
101078	02	1	G	G	G	G		G	G	G	G	G	G	G	G		G			G		G				G	G
081578	02	2	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
082278	02	2	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	P	G	G	G
C82978	02	2	G	G	G			G	G	G	G		G		G	G	G	G	G	G		G	G		G	G	
090578	02	2	G	G				G	G	G			G		G	G	G	G	G	G		G	G		G	G	
091278	02	2	G	G				G	G	G			G		G	G	G	G	G	G		G	G		G	G	
091978	02	2	G	G				G	G	G			G		G	G	G	G	G	G		G	G		G	G	
C92678	02	2	G	G				G	G	G			G		G	G	G	G	G	G		G	G		G	G	
101C78	C2	2	G	G				G	G	G			G		G	G	G	G	G	G		G	G		G	G	
081578	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
082278	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G
082978	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G
090578	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G
C91278	C2	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G
091978	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G
092678	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G
101078	02	3	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G			G	G	G	G	G

MO DA YR	TR	CD																								
081578	02	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	02	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	P	P
082978	02	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		
090578	02	4	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		
091278	02	4	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		
091978	02	4	G	G	G				G	G	G	P	G	G	G		G	P	G			G	G	G	G		
092678	02	4	G	G	G				G	G	G	P	G	G	G		G	P	G			G	G				
101078	02	4	G	G	G				G	G	G	P	G	G	G		G	P	G			G	G				
081578	02	5	G	G	G	G	G	G	G	G	G	G	G	G	G					G	G	G	G	G	G	G	G
082278	02	5	G	G	G	G	G	G	G	G	G	G	G	G	G					G	G	G	G	G	G	G	G
082978	02	5	G		G	G	G	G	G	G	G	G	G	G	G					G	G	G	G	G	G	G	G
090578	02	5	G		G	G	G	G	G	G	G	G	G	G	G						G		G	G	G	G	G
091278	02	5	G		G	G	G	G	G	G	G	G	G	G	G						G		G	G	G	G	G
091978	02	5	G		G	G	G	G	G	G	G	G	G	G	G						G		G	G	G	G	G
092678	02	5	G		G	G	G	G	G	G	G	G	G	G	G						G		G	G	G	P	G
101078	02	5	G		G	G	G	G	G	G	G	G	G	G	G						G		G	G	G	P	G
081578	02	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091978	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092678	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
101078	02	6	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																								
081578	03	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	03	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	03	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
090578	03	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
091278	03	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
091978	03	1	G	G	G	G	G	G	G	G		G		G	G		G	G	G	G	G	G	G	G	G		G
092678	03	1	G	G	G	G	G	G	G	G		G		G	G		G	G	G	G	G	G	G	G	G		G
101078	03	1	G	G	G	G	G	G	G	G		G		G	G		G	G	G	G	G	G	G	G	G		G
081578	03	2	G	G		G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G
082278	03	2	G	G		G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G
082978	03	2	G	G		G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
090578	03	2	G	G		G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
091278	03	2	G	G		G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
091978	03	2	G	G		G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
092678	03	2	G	G		G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
101078	03	2	G	G		G	G			G	G	G	G	G	G			G	G	G	G	G	G	G	G		G
081578	03	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	03	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	03	3	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
090578	03	3	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
091278	03	3	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
091978	03	3	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
092678	03	3	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
101078	03	3	G	G	G	G	G	G			G	G	G	G	G	G	G	G			G	G	G	G	G	G	

MO DA YR	TR	CD																									
081578	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	03	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	03	4	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	03	4	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	03	4	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091978	03	4	G					G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
092678	03	4	G					G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
101078	03	4	G					G	G	G	G	G	G	G	G		G	G	G	G	G	G	G			G	G
081578	03	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	03	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	03	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
090578	03	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
091278	03	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
091978	03	5		G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
092678	03	5		G		G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
101078	03	5		G		G		G	G	G	G	G	G	G				G	G	G	G	G	G	G		G	G
081578	03	6	G	G		G		G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
082278	03	6	G	G		G		G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
082978	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
090578	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
091278	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
091978	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
092678	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G
101078	03	6	G	G				G	G	G		G	G	G	G	G	G	G		G	G	G		G	G	G	G

MO DA YR	TR	CD																								
081578	04	1	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	1	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	1	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	04	1	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	04	1	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091978	04	1	G		G		G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092678	04	1	G		G		G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
101078	04	1	G		G		G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
081578	04	2		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	2		G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	2		G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	
090578	04	2		G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	
091278	04	2		G	G	G		G	G		G		G	G	G	G	G	G	G		G	G	G	G	G	G	
091978	04	2		G	G	G		G	G		G		G	G	G	G	G		G		G	G	G	G	G	G	
092678	04	2		G	G	G		G	G		G		G	G	G	G	G		G		G	G	G	G	G	G	
101078	04	2		G	G	G		G	G		G			G	G	G	G		G		G	G		G	G	G	
081578	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G	G	G
090578	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G	G	G
091278	04	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G			G	G	G	G	G
091978	04	3	G	G	G	G	G	G	G	G	G	G	G	G		G				G			G	G	G	G	G
092678	04	3	G	G	G	G	G	G	G	G	G	G	G	G		G				G			G	G	G	G	G
101078	04	3	G	G	G	G	G	G	G	G	G	G	G	G		G				G			G	G	G	G	G

MO DA YR	TR	CD																								
081578	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
090578	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
091278	04	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
091978	04	4	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
092678	04	4	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
101078	04	4	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G				G	G	G	G	G	G
081578	04	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
090578	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
091278	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
091978	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
092678	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
101078	04	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G
081578	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G		G		G	G	G	G	
091978	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G		G		G	G	G	G	
092678	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G		G		G	G	G	G	
101078	04	6	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G		G		G	G	G	G	

MO DA YR	TR	CD																								
081578	05	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	05	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	05	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	05	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	05	1	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
091978	05	1	G	G	G	G	G	G	G		G	G		G		G		G		G	G	G	G	G	G	G	G
092678	05	1	G	G	G	G	G	G	G		G	G		G		G		G		G	G	G	G	G	G	G	G
101078	05	1	G	G	G	G	G	G	G		G	G		G		G		G		G	G	G	G	G	G	G	G
081578	05	2	G	G	G	G		G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G
082278	05	2	G	G	G	G		G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G
082978	05	2	G		G	G		G	G	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G
090578	05	2	G		G	G		G	G	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G
091278	05	2	G		G	G			G	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G
091978	05	2	G		G	G			G			G	G	G	G			G	G	G	G	G	G	G	G	G	G
092678	05	2	G		G	G			G			G	G	G				G	G	G	G	G	G	G	G	G	G
101078	05	2	G		G	G			G			G	G	G				G	G	G	G	G	G	G	G	G	G
081578	05	3	G	G	G	G	G	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G
082278	05	3	G	G	G	G	G	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G
082978	05	3	G	G	G	G	G	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G
090578	05	3	G	G	G	G	G	G	G	G	G	G		G		G	G	G	G	G	G	G	G	G		G	G
091278	05	3			G	G	G	G	G	G	G	G		G			G	G	G	G	G	G	G	G		G	G
091978	05	3			G	G	G	G	G	G	G	G		G			G	G	G	G	G	G	G	G		G	G
092678	05	3			G	G	G	G	G	G	G	G		G			G	G	G	G	G	G	G	G		G	G
101078	05	3			G	G	G	G	G	G	G	G		G			G	G	G	G	G	G	G	G		G	G

MO DA YR	TR	CD																								
081578	05	4	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G	G	G	G
082278	05	4	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	G	G	G	G
082978	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	G	G
090578	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	G	G
091278	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	G	G
091978	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	P	G
092678	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	P	G
101078	05	4	G	G	G	G	G	G	G	G	G	G	G		G				G	G	G	G	G	G	G	P	G
081578	05	5	G	G	G	G		G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	05	5	G	G	G	G		G				G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	G
090578	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	G
091278	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	
091978	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	
092678	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	
101078	05	5	G	G	G	G		G				G	G	G	G	G	G	G		G				G		G	
081578	05	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	05	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	05	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G
090578	05	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G
091278	05	6			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G
091978	05	6			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G
092678	05	6			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G
101078	05	6			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G

MO DA YR	TR	CD																								
081578	06	1	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	06	1	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	1	G	G		G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	06	1	G	G		G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	06	1	G	G		G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G		G
091978	06	1	G	G		G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G		G
092678	06	1	G	G		G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G		G
101078	06	1	G	G		G	G		G	G			G	G	G	G	G	G	G	G	G	G	G	G	G		G
081578	06	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	06	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	2	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G	G		G	G
090578	06	2	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G	G		G	G
091278	06	2	G	G	G	G	G	G	G	G	G	G	G	P	G	G		G	G	G	G	G	G	G		G	G
091978	06	2	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G	G	G	G	G	G		G	G
092678	06	2	G	G	G	G	G	G	G	G	G	G	G		G	G		G	G			G	G	G		G	G
101078	06	2	G	G	G	G	G	G	G	G	G	G	G		G	G		P	G			G	G	G		G	G
081578	06	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	06	3	G	G	G		G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	3	G	G	G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
090578	06	3	G	G	G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091278	06	3	G	G	G		G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
091978	06	3	G	G			G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
092678	06	3	G	G			G	G					G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
101078	06	3	G	G			G	G					G	G	G	G	G	G	G	G	G		G	G	G	G	G

MO DA YR	TR	CD																								
081578	06	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	06	4	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	4	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P
090578	06	4	G	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	P
091278	06	4	G	G	G			G	G	G		G	G	G		G	G	G	G	G	G	G				P	P
091978	06	4	G	G	G			G	G	G		G	G	G			G	G	G	G	G	G				P	P
092678	06	4	G	G	G			G	G	G		P	G	G			G	G	G	G	G	G				P	P
101078	06	4	G	G	G			G	G	G		P	G	G				G	G	G	G	G				P	P
081578	06	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
090578	06	5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
091278	06	5			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
091978	06	5			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
092678	06	5			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G
101078	06	5			P	G	G	G				G	G	G	G	G	G	G	G	G	G	G	G				G
081578	06	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	06	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	06	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
090578	06	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
091278	06	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G					
091978	06	6	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G					
092678	06	6	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
101078	06	6	G	G	G		G	G	G	G	G	G	G	G	G	G		G	G	G	G						

MO DA YR	TR	CD																								
081578	08	1	G	G		G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G
082278	08	1	G	G		G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G
082978	08	1	G	G		G	G	G	G	G	G	G	G	P	G	G	G		G	G	G	G	G	G	G		G
090578	08	1	G	G		G	G	G	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G		G
091278	08	1	G	G		G	G	G	G		G	P	G		G	G	G		G	G	G	G	G	G	G		G
091978	08	1	G	G			G	G	G		G	P	G		G	G	G		G	G	G	G	G	G	G		
092678	08	1	G	G			G	G	G		G	P	G		G	G	G		G	G	G	G	G	G	G		
101078	08	1	G	G			G	G	G		G	P	G		G	G	G		G	G	G	G	G	G	G		
081578	08	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G
082278	08	2	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G		G	G	P	G	G	G	G	G
082978	08	2	G	G	G	G	G		G	G		G	G			G	G	G		G	G			P	G	G	G
090578	08	2	G	G	G	G	G		G	G		G	G			G	G	G		G	G			P	G	G	G
091278	08	2	G	G	G	G	G		G	G		G	G			G	G	P		G	G				G	G	G
091978	08	2	G	G	G	G	G		G	G		G	G			G	G	P		G	G				G	G	G
092678	08	2	G	G	G	G	G		G	G		G	G			G	G	P		G	G				G	G	
101078	08	2	G	G	G	G	G		G	G		G	G			G	G	P		G	G				G	G	
081578	08	3		G	G	G	G	G	G	G	G	G	P	G			G	G	G				G	G	G	G	G
082278	08	3		G	G	G	G	G	G	G	G	G	P				G	G	G				G	G	G	G	G
082978	08	3		G	G	G		G	G	G	G	G	P				G	G	G				G	G	G	G	G
090578	08	3		G	G	G		G			G	G	P				G	G	G				G	G	G	G	G
091278	08	3		G	G	G		G			G	G	P				G	G	G					G	G	G	G
091978	08	3			G	G		G			G	G	P				G	G	G					G	G	G	G
092678	08	3			G	G		G			G	G	P				G	G	G					G	G	G	G
101078	08	3			G	G		G			G	G	P				G	G	G					G	G	G	G

MO DA YR	TR	CD																									
081578	08	4	G	G	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G		G	G	G
082278	08	4	G	G	P	G		G	G	G	G	G	G		G	G		G	G	G	G	G	G		G	G	G
082978	08	4	G	G	P			G	G	G	G	G	G		G	G		G	G	G	G	G	G		G	G	G
090578	C8	4	G	G	P			G	G	G	G	G	G		G	G		G	G	G	G		G		G	G	G
091278	C8	4	G	P				G	G	G	G	G	G		G	G		G	G	G	G		G		G	G	G
091978	08	4	G	P				G	G	G	G	G	G		G	G		G	G	G	G		G		G	G	G
092678	C8	4	G	P				G	G	G	G	G	G		G	G		G	G	G	G		G		G	G	G
101078	08	4	G	P				G	G	G	G	G	G		G	G		G	G	G	G		G		G	G	G
081578	C8	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
082278	08	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
082978	08	5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
090578	08	5	G	G	G	G			G	G	G	G		G	G	G	G	G		G	G	G	G	G	G	G	G
091278	C8	5	G	G	G	G			G	G	G	G		G	G	G	G	G		G	G	G	G	G	G	G	G
091978	08	5	G	G	G				G	G	G	G		G	G	G	G	P		G	G	G	G	G	G	G	G
092678	C8	5	G	G	G				G	G	G	G		G	G	G	G	P		G	G	G	G	G	G	G	G
101078	08	5	G	G	G				G	G	G	G		G	G	G	G	P		G	G	G	G	G	G	G	G
C81578	C8	6	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
082278	08	6	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
082978	08	6	P	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
090578	C8	6	P	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
091278	08	6	P	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
C91978	08	6	P	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
092678	08	6	P	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
101078	08	6	P	G	G	G	G	G	G	G	G		G	G	G			G	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																									
081578	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
082278	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	
082978	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	
090578	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	
091278	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	
091978	11	1	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	
092678	11	1	G			G		G	G			G	G	G	G		G		G	G		G			G	G	
101078	11	1	G			G		G	G			G	G	G	G		G		G	G		G			G	G	
081578	11	2	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G		G	G		G
082278	11	2	G	G	G	G	G	G	G	G	G	G		G	G		G	G	G	G	G	G		G	G		P
082978	11	2	G	G	G	G	G	G	G	G	G	G		G	G		G	G	G	G	G	G		G	G		P
090578	11	2	G	G	G	G	G	G	G	G	G	G		G	G		G	P	G	G	G	G		G	G		P
091278	11	2	G	G	G	G	G	G	G	G	G	G		G	G		G	P	G	G	G	G		G	G		P
091978	11	2	G	G	G	G	G	G	G	G	G	G		G	G		G	P	G	G	G	G		G	G		P
092678	11	2	G	G	G		G	G	G	G	G	G		G	G		G	P	G	G	G	G		G	G		P
101078	11	2	G	G	G		G	G	G	G	G	G		G	G		G	P	G	G	G	G		G	G		
081578	11	3	G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G
082278	11	3	G	G		G	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G
082978	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G	G	G	G
090578	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G	G	G	G
091278	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G	G	G	G
091978	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G	G	G	G
092678	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G			
101078	11	3	G	G		G	G	G	G	G	G	G			G	G		G	G	G	G	G	G	G			

MO DA YR	TR	CD																									
081578	11	4	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
C82278	11	4	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
082978	11	4	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
090578	11	4	G	G	G	G		G			P	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
091278	11	4	G	G	G	G		G			P	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
091978	11	4	G	G	G	G		G			P	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
092678	11	4				G		G			P	G	G			G	G	G	G	G	G	G		G	G	G	G
101C78	11	4				G		G			P	G	G			G	G	G	G	G	G	G		G	G	G	G
081578	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		G	G
082278	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G			G	G
082978	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G			G	G
090578	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	P	G	G			G	G
091278	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	P	G	G			G	G
091978	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	P	G	G			G	G
092678	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	P	G	G				
101C78	11	5				G	G	G	G	G	G	G	G	G	G	G	G	G		G	P	G	G				
C81578	11	6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
082278	11	6	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G	G		G	G	G	G
082978	11	6	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G	G		G	G	G	G
090578	11	6	G	G	G	G	G	G	G	P	G	P	G	G	G	G	G	G	G	G	G	G		G	G	G	G
091278	11	6	G	G	G	G	G	G	G	P	G	P	G	G	G	G	G	G	G	G	G	G		G	G	G	G
091978	11	6	G	G	G	G	G	G	G	P	G	P	G	G	G	G	G	G	G	G	G	G		G	G	G	G
092678	11	6			G	G			G	P	G	P	G	G		G	G	G	G	G	G	P		G	G	G	G
101J78	11	6			G	G			G	P	G	P	G	G		G	G	G	G	G	G	P		G	G	G	G

MO DA YR TR CD

081578	12	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	12	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
082978	12	1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
090578	12	1	P	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
091278	12	1	P	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
091978	12	1	P	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
092678	12	1	P	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
101078	12	1		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	
081578	12	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
082278	12	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
082978	12	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
090578	12	2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P		G	G	G	G	G
091278	12	2	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	P		P		G	G	G	G	G
091978	12	2	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	P		P		G	G	G	G	G
092678	12	2	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	P		P		G	G	G	G	G
101078	12	2	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	P		P		G	G	G	G	G
081578	12	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	12	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082978	12	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G
090578	12	3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	P	G	G	G	G	G	G	G	G	G
091278	12	3	G	G	G	G	G	G	G	G	G	G	G	G	P	P	G	P	G	G	G	G	G	G	G	G	G
091978	12	3	G	G	G	G	G	G	G	G	G	G	G	G	P	P	G	P	G	G	G	G	G	G	G	G	G
092678	12	3	G	G	G	G	G	G	G	G	G	G	G	G	P	P	G	P	G	G	G	G	G	G	G	G	G
101078	12	3	G	G	G	G	G	G	G	G	G	G	G	G	P	P	G	P	G	G	G	G	G	G	G	G	G

MO DA YR	TR	CD																								
081578	12	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
082278	12	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
082978	12	4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
090578	12	4	G	G	G	G	G	G	G					G	G	G	G	G	G	G	G	G	G		G	G	G
091278	12	4	G		G	G	G	G	G					G	G	G	G	G	G	G	G	G	G		G	G	G
091978	12	4	G		G	G	G	G	G					G	G	G	G	G	G	G	G	G	G		G	G	G
092678	12	4	G		G	G	G	G	G					G	G	G	G	G	G	G	G	G	G		G	G	G
101078	12	4	G		G	G	G	G	G					G	G	G	G	G	G	G	G	G	G			G	G
081578	12	5	G	G		G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G
082278	12	5	G	G		G	G	G			G	G	G	G	G	G	G	G	G	G	G	G			G	G	G
082978	12	5	G	G		G	G	G			G	G	G	G	G	G	G	G	G	G	G	G			G	G	G
090578	12	5	G	G		G	G	G			G	G	G	G		G	G	G	G	G	G	G			G	G	G
091278	12	5	G	G			G	G			G	G	G	G		G	G	G	G	G	G	G			G	G	G
091978	12	5	G	G			G	G			G	G	G	G		G	G	G	G	G	G	G			G	G	G
092678	12	5	G	G			G	G			G	G	G	G		G	G	G	G	G	G	G			G	G	G
101078	12	5	G	G			G	G			G	G	G	G		G	G	G	G	G	G	G			G	G	G
081578	12	6	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G		G
082978	12	6	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G		G
090578	12	6	G			G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G		G
091278	12	6	G			G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G		G
091978	12	6	G			G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G		G
092678	12	6	G					G	G	G	G	G		G		G	G	G	G	G	G	G		G	G		G
101078	12	6	G					G	G	G	G	G		G		G	G	G	G	G	G	G		G	G		G

VITA [2]

Michael J. Hall

Candidate for the Degree of

Doctor of Philosophy

Thesis: DEVELOPMENT AND VALIDATION OF A SEQUENTIAL SAMPLING PLAN FOR THE PECAN WEEVIL IN A COMMERCIALLY MANAGED PECAN ORCHARD.

Major Field: Entomology

Biographical:

Personal Data: Born in Schwenningen a/N, West Germany, November 15, 1951, the son of Heinz and Marliese Hall.

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Organizations: Entomological Society of America