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Informal Report

MASTER

**Bidding and Production Profiles for the Various
Outer Continental Shelf Leasing Methodologies
1954-1978**

University of California



LOS ALAMOS SCIENTIFIC LABORATORY

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Lawrence A. Bruckner
Gayle J. Thomas

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BIDDING AND PRODUCTION PROFILES FOR THE VARIOUS
OUTER CONTINENTAL SHELF LEASING METHODOLOGIES
1954-1978

by

Lawrence A. Bruckner
Gayle J. Thomas

ABSTRACT

The 1978 Outer Continental Shelf Lands Act Amendments charged the government with promulgating new regulations concerning the leasing of offshore tracts for hydrocarbon development. Among the reasons for this charge were to increase competition, reduce front-end money, and stimulate production.

We used box plots to provide profiles of the bidding and production data from the different historical leasing methodologies. These profiles can be used to provide insights into the present data and to allow comparison with results of the new regulations.

I. INTRODUCTION

Since 1954, through the process of competitive bidding, the Federal Government has been leasing tracts on the Outer Continental Shelf (OCS) to oil and gas companies for hydrocarbon development. In the 46 lease sales through 1978, over 7000 tracts were offered for lease; of these, 3744 received bids and 3350 actually were leased. Bids on the other 394 tracts were rejected because they were deemed to be too low.

The data from these 46 OCS lease sales is difficult to digest. The sales span 25 years, cover numerous regions off a dozen states, and employ various leasing methodologies. Furthermore, some tracts are leased in frontier areas, others in proved areas. The former tracts are referred to as wildcat (W), the latter as drainage or development (D).

It is the purpose of this report to provide a reference document that summarizes some of the bidding and production data from tracts leased according to the various methodologies. It is hoped that these summaries will be useful when studying the effect of new leasing regulations.

Although much effort has gone into data validation, no claim is made that the data displayed is 100% accurate. We derived our data from the LPR System-5 and System-10¹ data tapes, which are continually being updated and corrected. In fact, a secondary purpose of this report is to provide another means of checking the accuracy of the data. It is possible that a few individual items are erroneous, though the data is believed to be of high quality.

The three leasing methodologies employed to date are the bonus-bid, fixed royalty method; the bonus-bid, sliding-scale royalty method; and the fixed bonus, royalty-bid method. These are described in Sec. II. The sale dates and geographic location of the leases by leasing method are presented in Sec. III.

Comparison of these leasing methods is accomplished by means of box plots^{2,3} of the data. To study the effect of a larger number of bids and greater potential for production, the box plots for each bidding and production variable considered are presented for four cases of issued leases: (1) all leases, (2) all leases receiving three or more bids, (3) all leases that produced, and (4) all leases satisfying both conditions (2) and (3). It should be noted that the data for the latter two cases is influenced by the fact that leases in later years have not had enough time to be brought to production status.

In Sec. IV, we describe the box plot notation and the leasing cases considered. Section V deals with the acreage leased by each method and Secs. VI and VII study the bidding and production variables, respectively. Where appropriate, the data is given in both nominal and constant (1976) dollars.

For each set of plots, we make some comments concerning the data displayed. These remarks are not meant to be exhaustive, but are intended only to reflect a few of our observations. No statistical tests have been performed to test the significance of observed differences. It is hoped that observations deemed important may be tested in the future.

The Appendices provide more detailed tables, notes on tracts offered in 1979, and a table of the Implicit Price Deflators employed to convert nominal to constant dollars.

II. LEASING METHODOLOGIES

The primary method for leasing OCS tracts has been the bonus-bid, fixed 1/6th royalty method. Under this procedure, the bidders bid a cash payment (bonus) to the government for the right to develop a tract. The high bidder is awarded the lease unless the government decides that the bids are not high enough. If hydrocarbons are discovered and produced, the lease owner pays the government 1/6th of the value of the hydrocarbons as royalty.

This method was used exclusively from the first OCS sale on October 13, 1954, through November 1975. Some 5500 tracts were offered by this method during this period. Two variations of the bonus-bid method have since been tried. The first variation was to replace the 1/6th royalty payment by a 1/3rd royalty payment (BB3); the second was to employ a sliding-scale royalty (SSR) rate payment. In the latter case the percentage paid to the government is a function of the value of the hydrocarbons produced. Both of these variations employ a bonus bid.

The fixed bonus, royalty-bid method (ROY) was used in 1974 and 1977 on 56 tracts off Louisiana and Alaska. Of these, 38 were bid on and all were issued. Under this system, the bidders agree to pay a preassigned bonus and bid the percentage of royalty they are willing to pay if hydrocarbons are found. The high bidder wins the lease.

The 1978 Outer Continental Shelf Lands Act Amendments⁴ directed the Department of Energy (DOE) to promulgate regulations relating to alternative bidding systems. One such system being considered now is a profit-share system. Briefly, such a system would involve bonus-bidding but without the royalty payments as in the past. Instead, the government would receive a fixed percentage of the "profits" from a lease. "Profit" is defined as the value of the produced hydrocarbons less the allowed exploration, development, and production costs. It is possible that a profit share system may be employed as early as September 1980.

III. THE OCS LEASE SALES

Figure 1 shows where the leasing and production activity has occurred through 1978. Notice that most of the activity has been in the Gulf of Mexico. There have been only three producing areas--off Louisiana, off Texas, and off southern California. Figures 2 and 3 and Tables I and II give the frequency

distribution of bid-on and issued leases by leasing methodology, lease type (Wildcat or Drainage), state, and sale years. A more complete set of tables by state and sale date is given in Appendix A (Tables A-1 - A-6).

It is also of interest to consider which leasing methodology has the highest percentage of offered tracts bid on. This data is presented in Table III. Because some tracts were offered and bid on (and even issued) more than once, and because of identification uncertainties, the actual number of distinct tracts in some categories may be slightly different than presented.

IV. BOX PLOTS AND LEASE CATEGORIES

In each box plot, eight statistics are plotted: the minimum, the 10th, 25th, 50th, 75th and 90th percentiles, the maximum, and the average values. The lower horizontal line represents the 25th percentile and the upper horizontal line, the 75th percentile. Hence, the interquartile range, is represented by the distance between the boxends. The median is represented

TABLE I
FREQUENCY DISTRIBUTION BY STATE FOR BONUS-BID,
1/6TH ROYALTY, WILDCAT (BW6) LEASES

State	Sale Years ^a	Number of Sales	Number of Leases ^b	
			Bid On	Issued
Alabama	73 - 75	5	45	40
California	63 - 75	4	200	181
Delaware	76	1	22	20
Florida	59 - 78	5	121	120
Georgia	78	1	11	6
Louisiana	54 - 78	19	1665	1527
New Jersey	76	1	64	60
Oregon	64	1	74	74
Texas	54 - 78	15	727	619
Washington	64	1	27	27
Alaska	76 - 77	2	142	133
TOTAL			3098	2807

^a1979 sales are described in Appendix B.

^bThe number of leases bid on and issued as a function of sale date is given in Tables A-1 - A-6 of Appendix A.

TABLE II

FREQUENCY DISTRIBUTION BY STATE FOR BONUS-BID,
1/6TH ROYALTY, DRAINAGE AND DEVELOPMENT (BD6) LEASES

State	Sale Years ^a	Number of Sales	Number of Leases ^b	
			Bid On	Issued
Alabama	73 - 76	3	11	10
California	76	1	1	1
Florida	73	1	3	3
Louisiana	59 - 78	20	430	358
Texas	75 - 78	7	47	30
TOTAL			492	402

^a1979 sales are described in Appendix B.

^bThe number of leases bid on and issued as a function of sale date is given in Tables A-1 - A-6 of Appendix A.

TABLE III

COMPARISON OF LEASING METHODOLOGIES BY FREQUENCY OF OFFERED,
BID ON, AND ISSUED LEASES, 1954-1978

	Numbers ^a		
	Offered	Bid On	Issued
Bonus 1/6th Royalty	7038	3590	3209
Bonus 1/3rd Royalty	18	18	16
Bonus Sliding Scale Royalty	177	98	87
	56	38	38
TOTAL	7289	3744	3350

^aIncludes repeat offerings.

by an x, the average by a □. All other percentiles including the minimum and maximum are represented by o's. When adjacent percentiles are identical, the symbols are overlaid and some degeneration of the plot will occur.

The notation for the plot labels is described in Table IV. Recall that W refers to a wildcat lease, D to a drainage or development lease, and SSR to a sliding-scale, royalty lease.

TABLE IV
NOTATIONAL CONVENTIONS FOR BOX PLOTS

<u>X-Axis Label</u>	<u>Lease Type</u>	<u>Leasing Methodology</u>	<u>Abbreviation</u>
A	W	Bonus Bid, 1/6th Royalty	BW6
B	D	Bonus Bid, 1/6th Royalty	BD6
C	W	Bonus Bid, 1/3rd Royalty	BW3
D	W	Bonus Bid, Sliding Scale Royalty	BWS
E	D	Bonus Bid, Sliding Scale Royalty	BDS
F	W	Fixed Bonus, Royalty Bid	ROY

Each page of plots contains four sets of box plots identified by the code in parentheses:

- All issued leases (blank or C)
- All issued leases that received three or more bids (N3 or C3)
- All producing leases (P or CP)
- All producing leases that received three or more bids (P3 or CP3)

The presence of a "C" following the variable title indicates that the data is given in constant (1976) or adjusted dollars. The values used to make this adjustment are given in Appendix C. When a "C" is not present the data is given in nominal dollars or the adjustment does not apply to the variable (for example, the number of bids).

The number of leases in each of the above lease categories is given in Table V. It is important to keep this table in mind when interpreting the box plots. For example, the percentiles in the BW6 or BD6 cases are based on large sample sizes and will not change much with the addition of more leases, but the percentiles in BDS or BW3 can be expected to change substantially with new data. It is interesting to note that all 16 BW3 leases received three or more bids. This would perhaps indicate that the bidders believed that these tracts were more likely to contain hydrocarbons. Because there has been very little production from these leases (three leases produced, but production was slight), no box plots will be drawn for the production variables.

Table V indicates that leases that receive three or more bids are more likely to produce than leases that receive one or two bids. Another study⁵ has shown that these three-or-more bid leases are also more likely to produce greater amounts of hydrocarbons.

TABLE V

FREQUENCY OF LEASES BY LEASE TYPE AND NUMBER OF BIDS-PRODUCTION STATUS

X-Axis Label	Code	Number of Leases			
		Issued	N3	pa	p3a
A	BW6	2807	1302	548	362
B	BD6	402	141	166	73
C	BW3	16	16	3	3
D	BWS	79	32	0	0
E	BDS	8	4	0	0
F	ROY	38	24	0	0
TOTAL		3350	1519	717	448

^aBecause production from these three leases has been slight, no production related box plots will be drawn for this case.

V. ACREAGE

Figure 4 presents the box plots for the acreage of the various cases of issued leases. The 16 BW3 leases clearly have the largest acreage per lease associated with them; the 38 ROY leases have only slightly less. The BD6 leases have the smallest acreage.

When restricted to the N3 case (leases receiving three or more bids), the leased acreage is less concentrated for the ROY leases. This would seem to imply that smaller acreage was thought to be more promising. Figure 3 helps to explain this. Eight of the 38 ROY leases were in the Gulf and received an average of 7.1 bids each. The remaining 30 leases were off Alaska. These leases, which were larger than the Gulf leases, drew only an average of 3.3 bids each. The Gulf leases were considered more promising.

A striking feature of the P plots is that over half of the BW6 leases were of 5000 acres. This can be explained by the fact that most production has occurred in the Gulf and that most wildcat tracts in that area are of 5000 acres. Note also that the median acreage for BD6 is 2500 acres, about one-half the median acreage of all BD6 leases.

VI. THE NUMBER AND SIZE OF BIDS

The distribution of the number of bids (NBIDS) received by an issued lease is presented in Fig. 5. Within the traditional 1/6th royalty leases, the wildcat leases have drawn more bids on the average than the drainage or development leases. All of the leases offered through the newer bidding methods, with the exception of BWS, drew more bids. In fact, all 16 BW3 tracts drew three or more bids. At present, it is not possible to separate the effect of leasing methodology from the effect of better tract prospects. Hence, inferences concerning the effect of leasing technique on number of bids are difficult to draw.

When restricted to the N3 leases, the median of BW6 jumps from two to five bids. Only BDS has a higher median number of bids but recall that there are only four BDS leases in the N3 category. A look at the P plots shows that leases with low NBIDS tend not to produce as often as leases with higher NBID values.

As should be expected, the dollar value of the bids for the particular cases reflects the patterns noted for NBIDS--leases receiving more bids tend to receive larger bids. There are two possible explanations for this. One comes from a statistical argument--as you get more bids from the same distribution, the maximum bid should increase. The other explanation is based on tract value. A tract perceived to be more valuable will receive more and higher bids than a tract perceived to be less valuable. The truth is probably a combination of the two.

Figures 6-9 display the high bid and high bid/acre in constant and nominal dollars. In all cases, the 16 BW3 leases drew the highest winning bids on the average. Next were the BDS leases and then the BD6 leases. Because one of the purposes of using a sliding scale royalty system was to reduce bonuses, the perceived tract value of these leases must be much higher than for the average BD6 tract.

On the wildcat leases, SSR appears to have diminished the higher high bids. The median values of BW6 and BWS are about equal, but the average, 75th, 90th, and 100th percentiles are lower for the BWS leases. If the tracts were of comparable value, then it would seem that SSR reduced the bonus.

Restriction to the N3 (or C3) case shows that for all methodologies the high bids increased. The median BW6 value increased to \$6 million from \$2 million and the median BWS value increased to \$5 million from \$2 million.

When only producing leases are considered, the cheaper leases tend not to produce as often as the more expensive leases.

It appears that the high bid is increased more by restriction to leases receiving three or more bids than by restriction to leases that have produced. Because this behavior is displayed in both constant and nominal dollars, it probably cannot be attributed to the fact that leases in later years have not had a chance to produce.

Figures 8 and 9 show the data on a per-acre basis. Because drainage leases are usually of smaller acreage than wildcat leases, division by acres changes the relative values for these cases. Thus, whereas the median high bid values of BW6 and BD6 are \$2 and \$4 million respectively, the median high bid/acre values are \$400 and \$1500 for the all-bid, constant dollar case.

Figure 10 shows the royalty rates for the different leasing procedures. Cases BW6, BD6, and BW3 have fixed rates by definition. The SSR rates have not been plotted because the rate varies with production. As with high bonus bids, high royalty bids increase when the N3 case is considered.

Box plots for average bids are presented in Figs. 11-16. As before, these can be computed on constant and nominal dollars and on a per-tract and per-acre basis. Because of the similarity among the three averages studied--the geometric mean bid, the arithmetic average bid, and the median bid--only the geometric mean bid plots are given in their entirety.

The patterns shown by the averages are generally similar to those shown by the high bids. It is interesting to note, however, that the high bid seems to be increased more when restricted to leases having three or more bids than when restricted to producing leases. This does not appear to always be the case with the average bids. In particular, the average bids for BD6 are higher for the producers than for the N3 case.

Actually, this pattern is not totally unexpected. High bids should be and are more influenced by increased number of bids than are average bids. Average bids are more influenced by tract value.

VII. PRODUCTION THROUGH 1978

Figures 17-22 display various production variables for the BW6 and BD6 leases. As was mentioned earlier, it was decided to exclude the three producing BW3 leases from the figures because the production was not very significant.

The first two variables considered are the number of calendar years in which there was any production, Production Years, and the number in which there was substantial production, Flush Years. Here, substantial is taken to mean "in excess of 200 barrels of equivalent oil per acre per year." To convert gas to its oil equivalent, we used the relationship 6 MCF gas = 1 bbl oil.

Figure 17 shows that less than 25% of the BW6 leases produced but that 25-50% of the BD6 leases produced. However, given production, the basic profiles are about the same. Yet Fig. 18 shows that, given production, the drainage leases have somewhat more flush years than the wildcat leases.

The production from the leases can be measured in terms of equivalent production (Fig. 19-20) or royalty (Fig. 21-22). Again, we see that the producing leases usually received a higher number of bids, but that a high number of bids does not guarantee production.

VIII. SUMMARY

Box plot profiles have been used to provide a visual comparison of bidding and production variables among the various leasing methodologies. Certain patterns have been observed but because, in general, the tracts were offered without statistical controls, statistical tests have not been run, nor inferences drawn.

It is clear that to test the effectiveness of new regulations on bidding and production, tracts must be offered under some form of designed experiment. Meanwhile, the profiles presented here can serve as a means towards understanding and digesting the historical data.

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OFFSHORE OIL AND GAS LEASES

OCT. 13, 1954 - DEC. 19, 1978

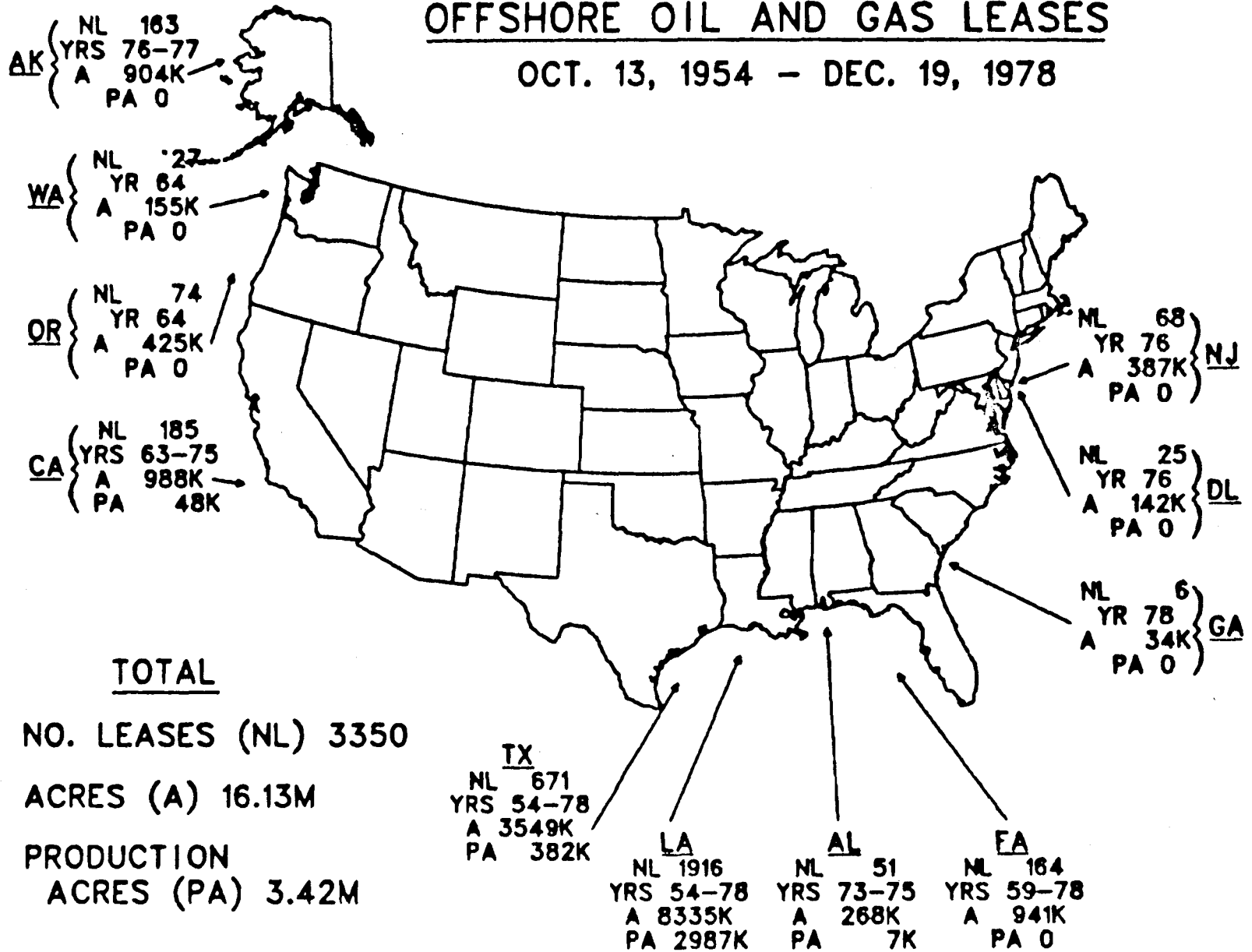


Fig. 1. Map of Outer Continental Shelf Lease areas.

BID ON TRACTS
1954 - 1978

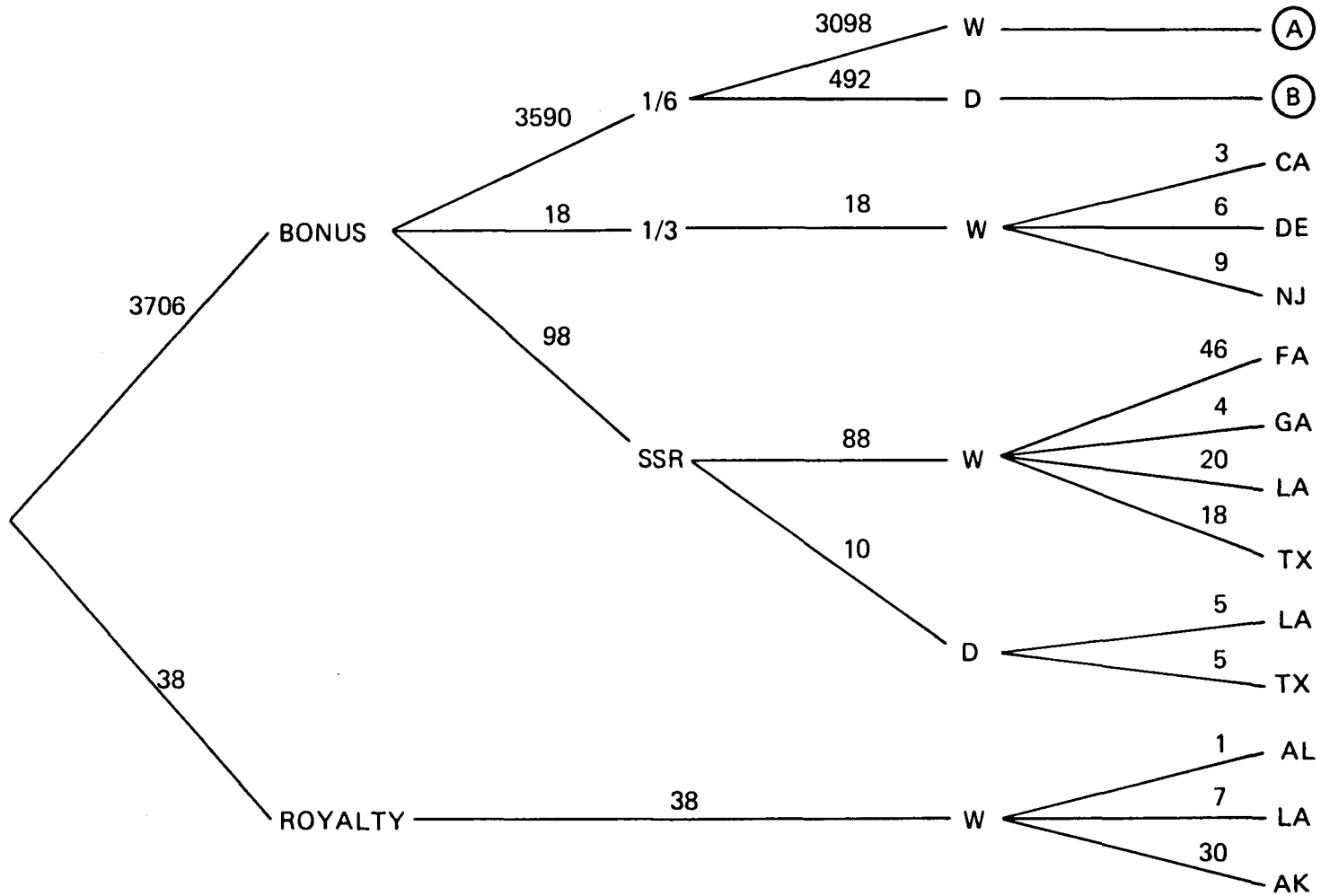


Fig. 2. Distribution of bid-on tracts by method and state.
(A) Details in Table I. (B) Details in Table II.

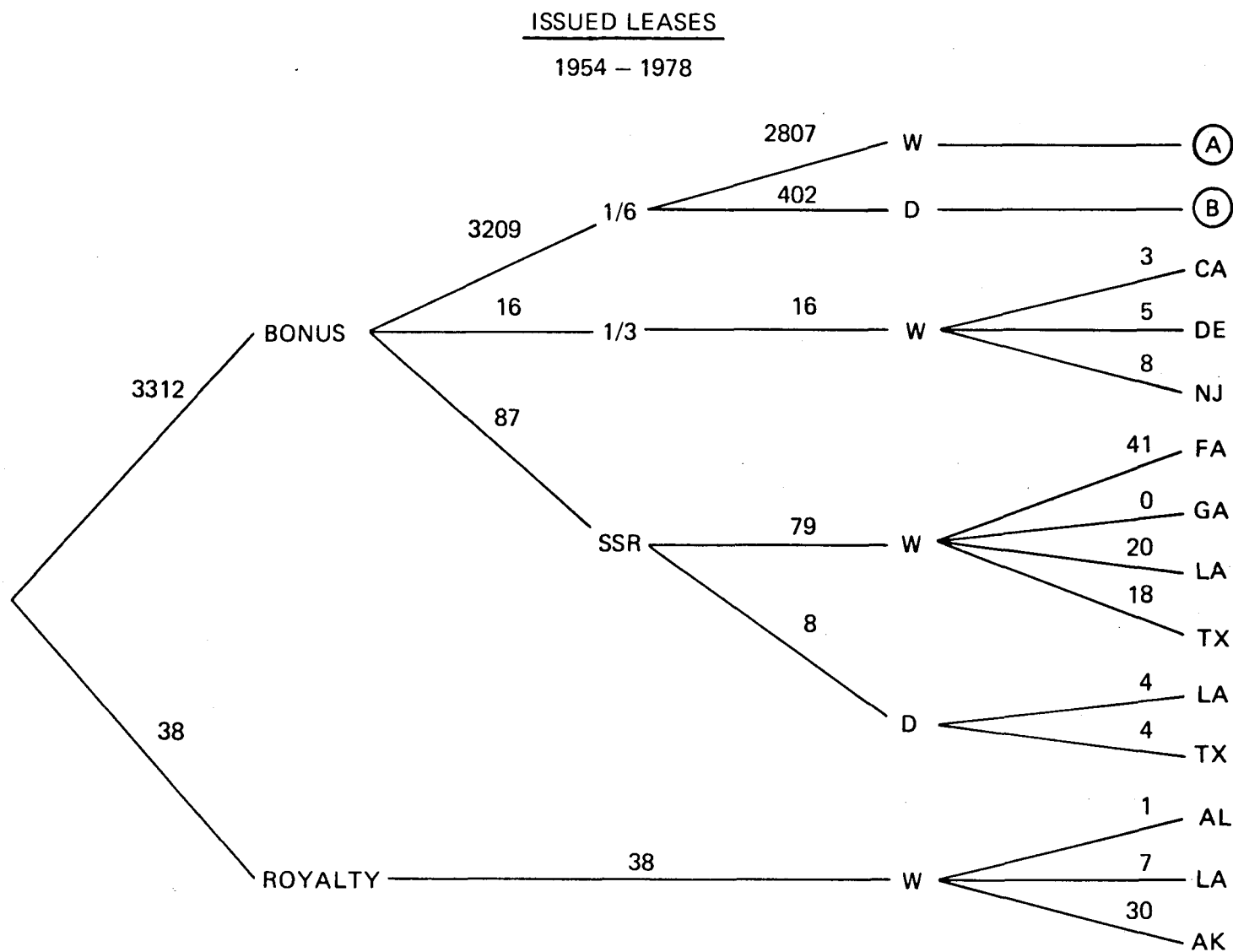


Fig. 3. Distribution of issued leases by method and state.
(A) Details in Table I. (B) Details in Table II.

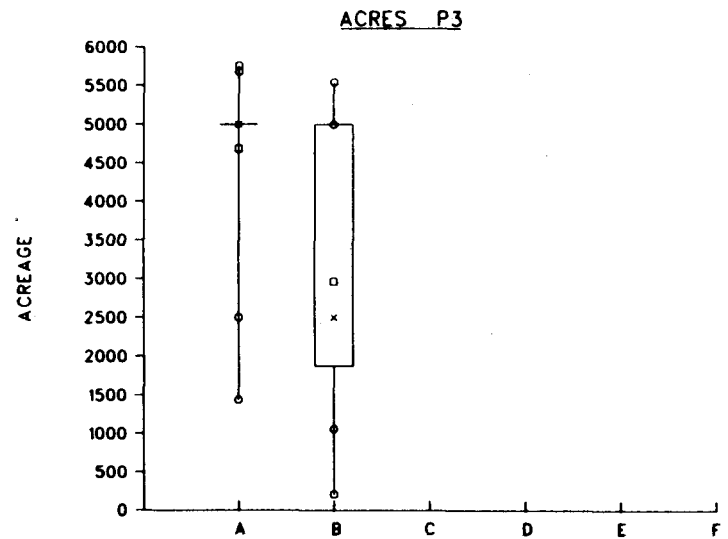
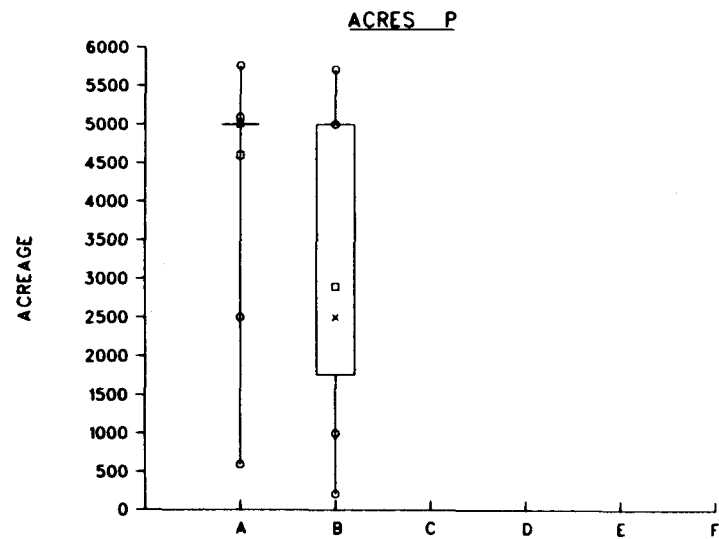
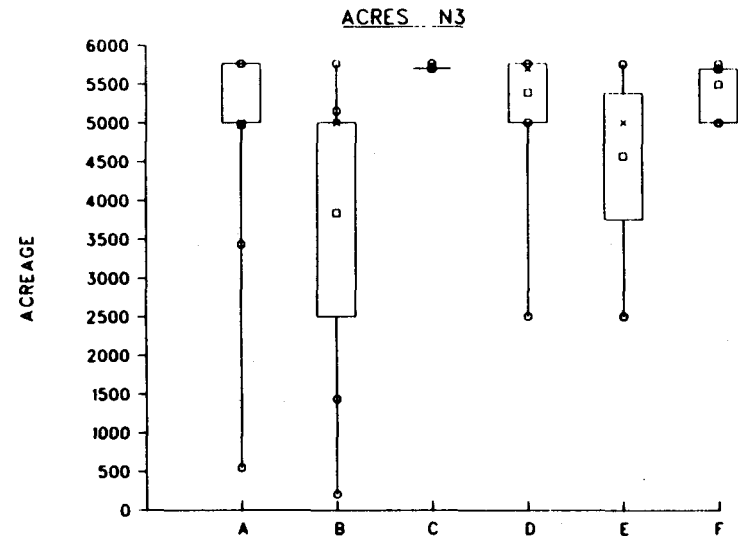
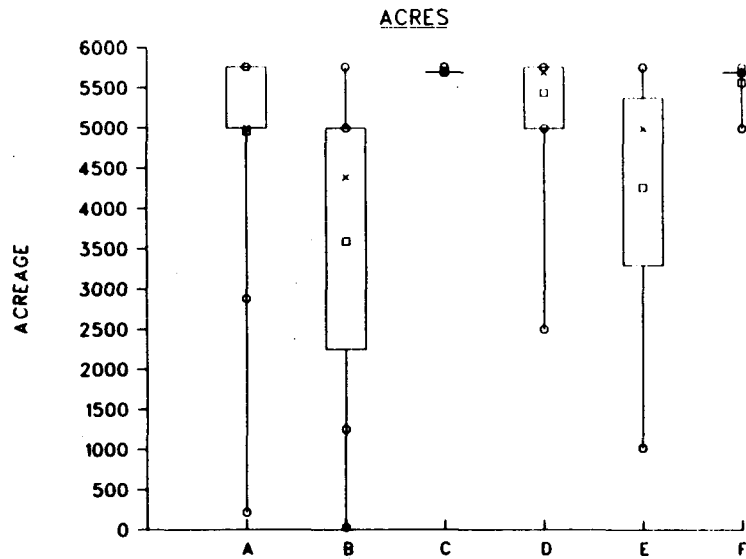


Fig. 4. Distribution of acreage by leasing method.

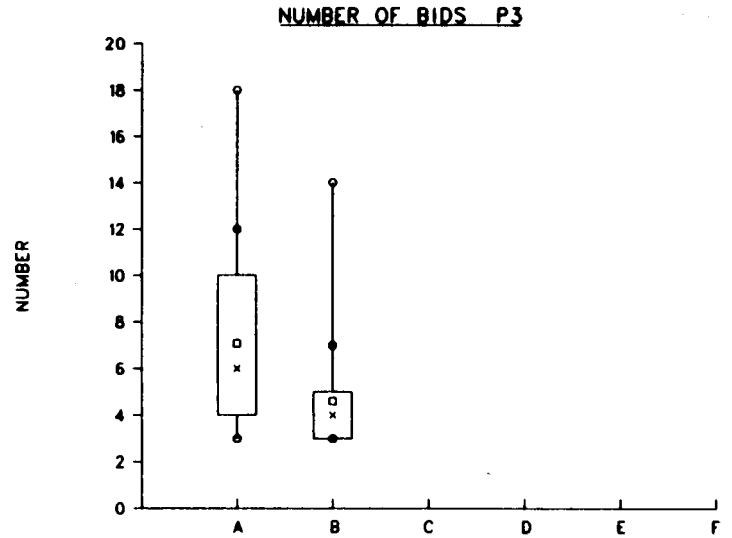
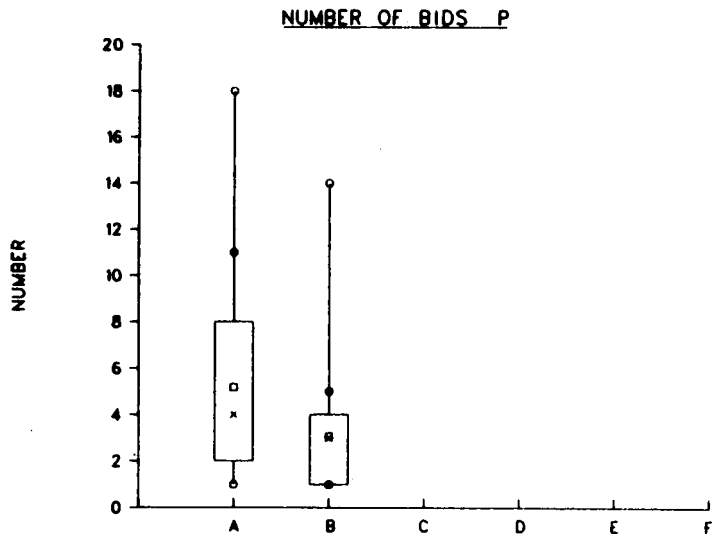
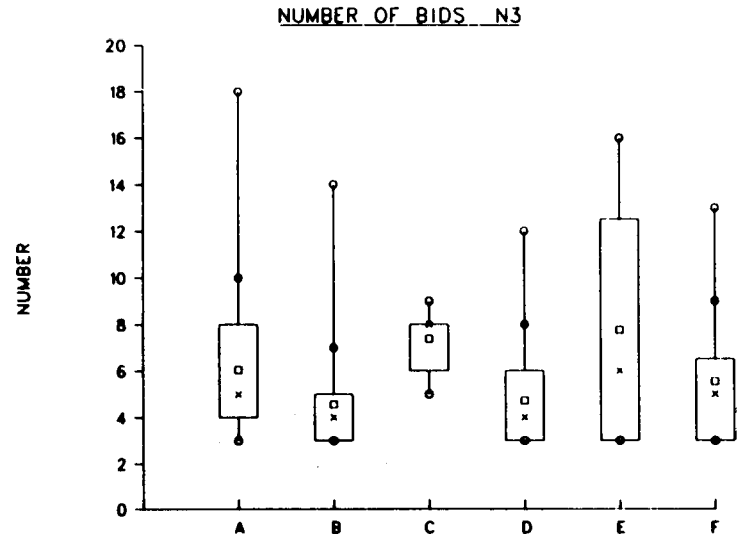
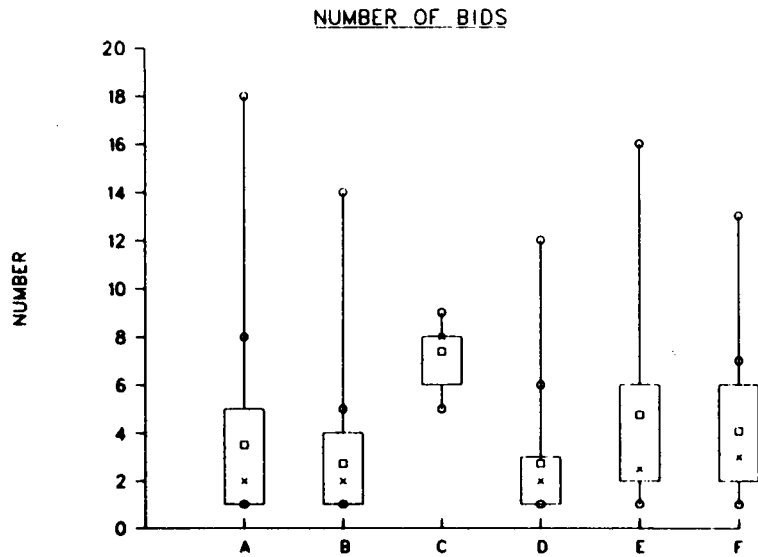


Fig. 5. Distribution of number of bids by leasing method.

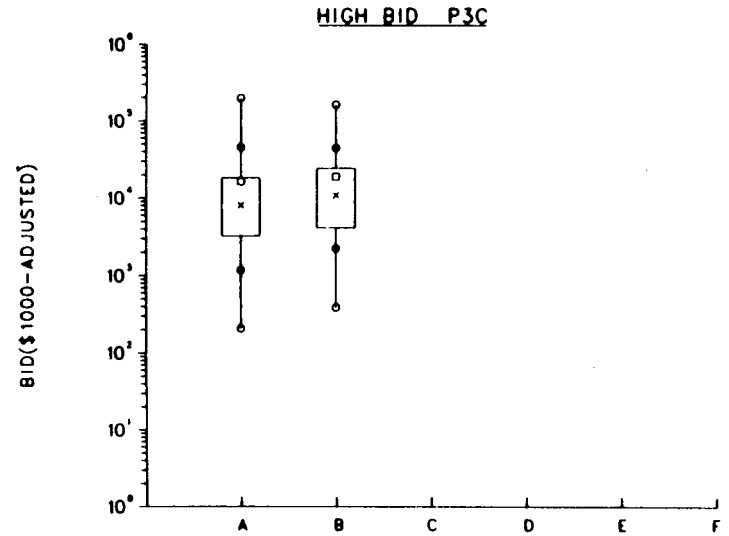
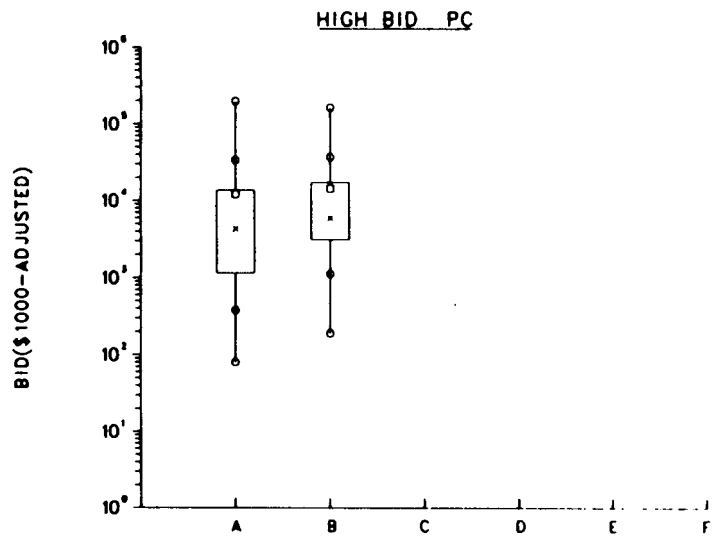
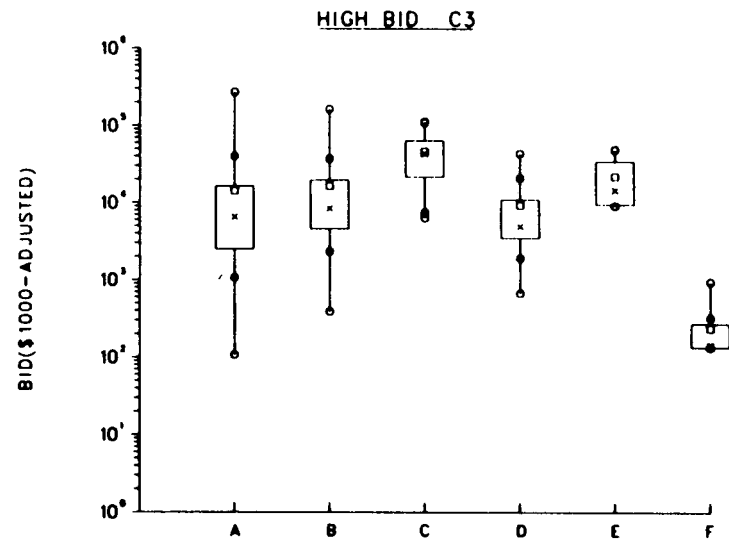
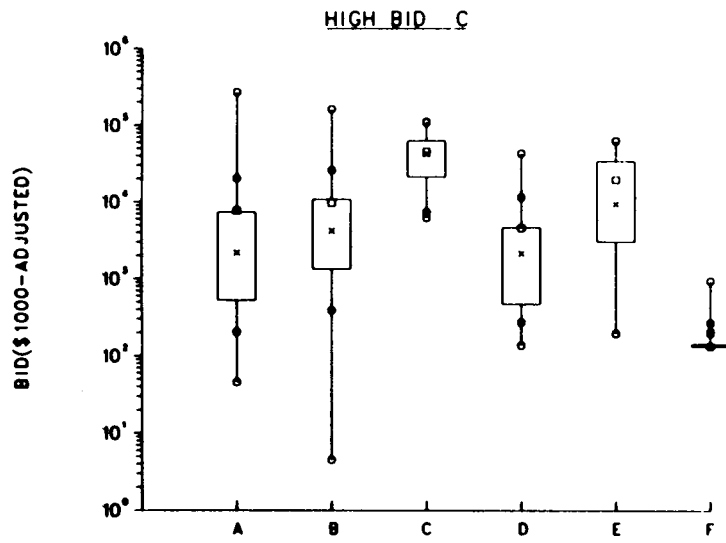


Fig. 6. Distribution of high bid by leasing method. (Constant Dollars)

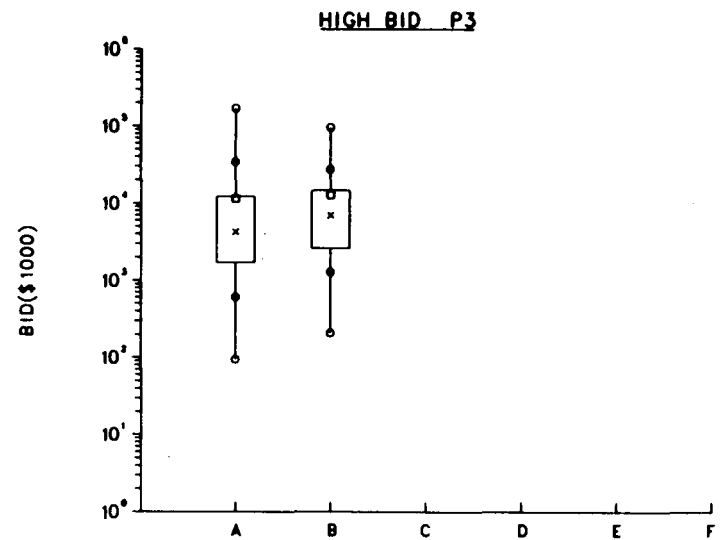
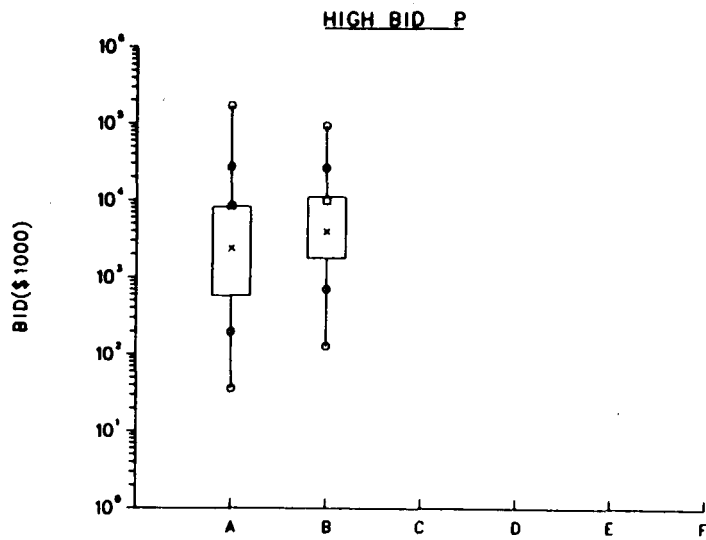
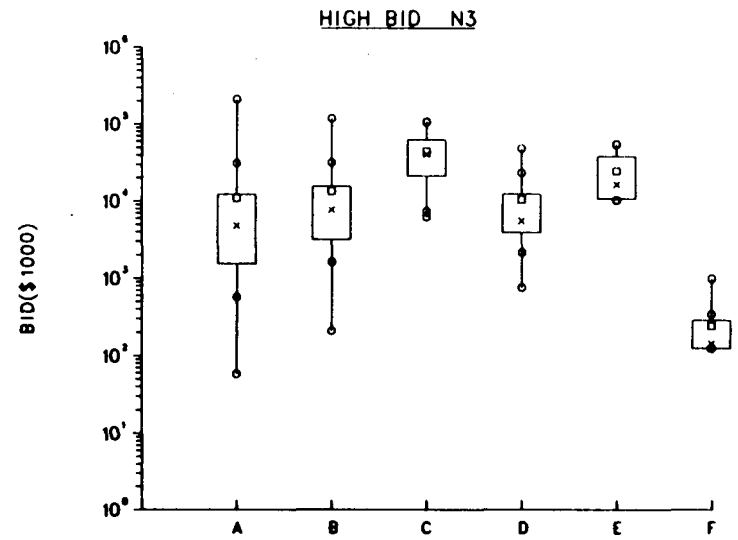
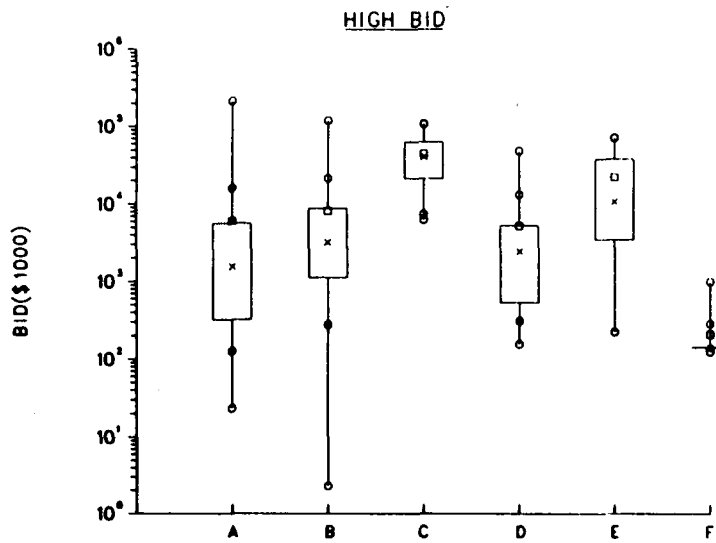


Fig. 7. Distribution of high bid by leasing method. (Nominal Dollars)

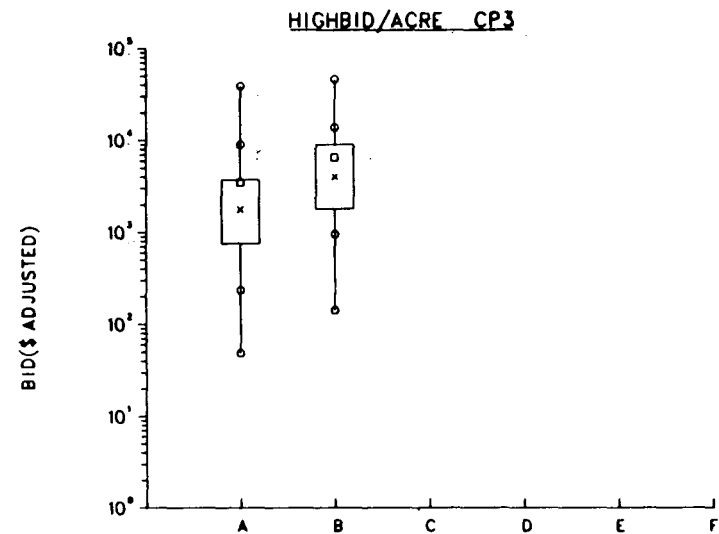
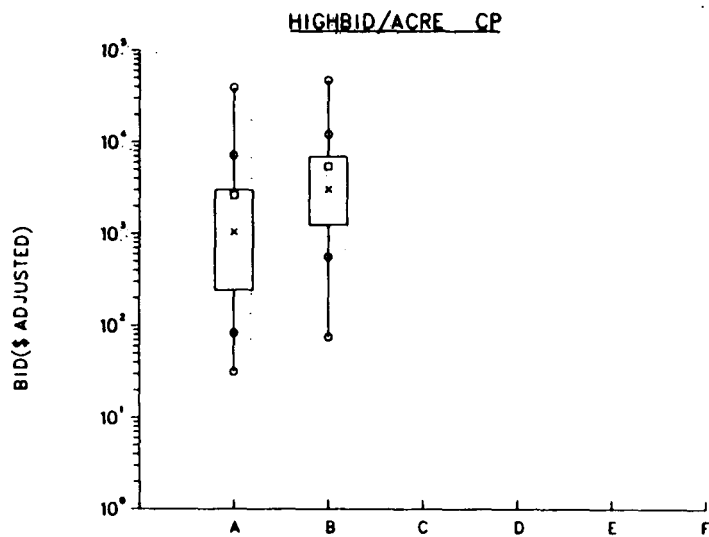
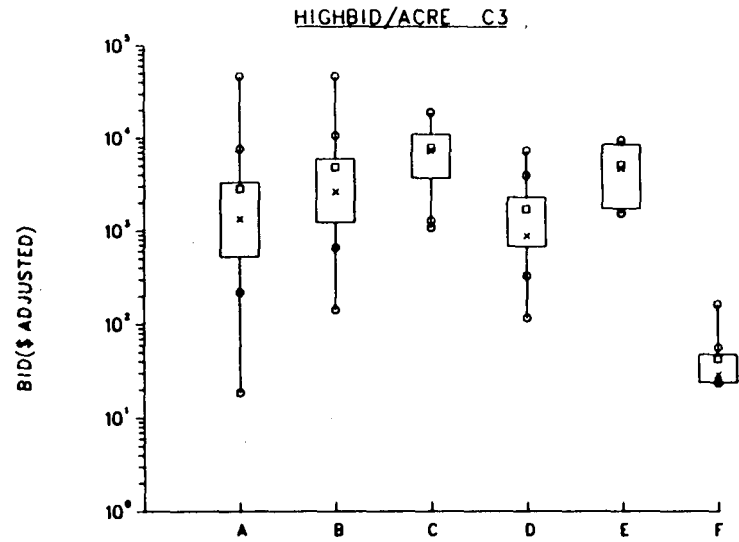
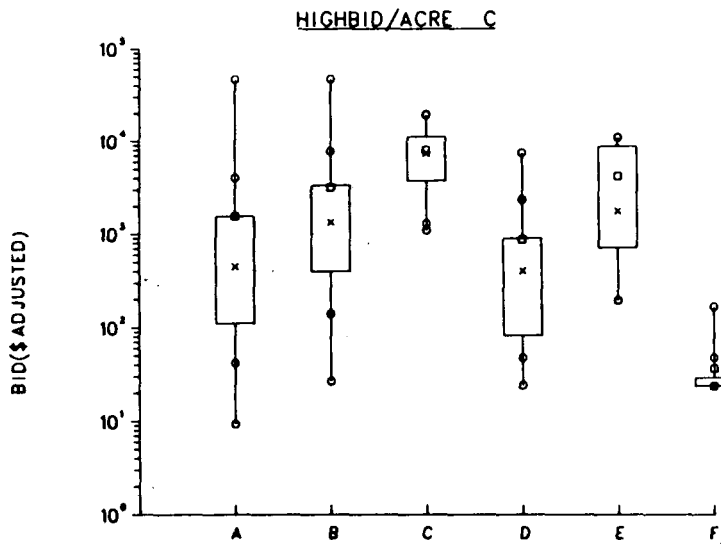


Fig. 8. Distribution of high bid/acre by leasing method. (Constant Dollars)

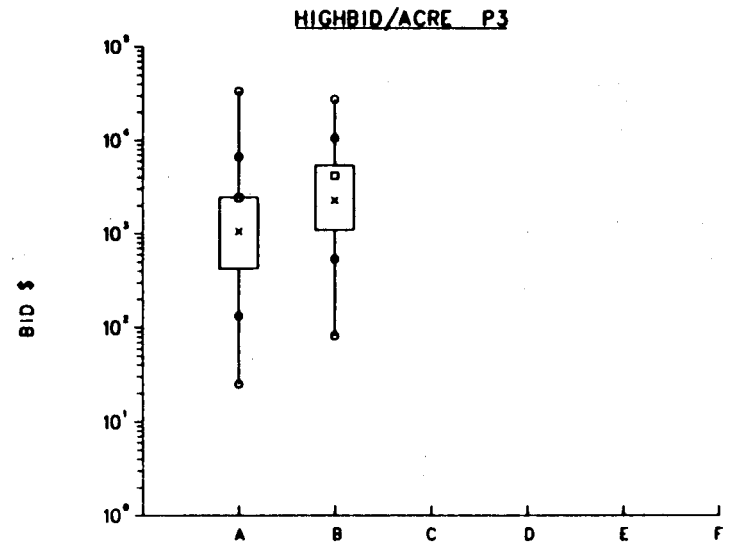
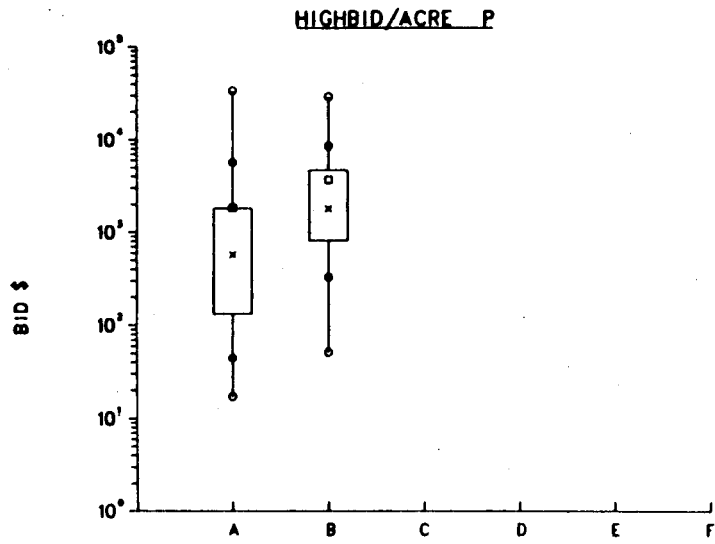
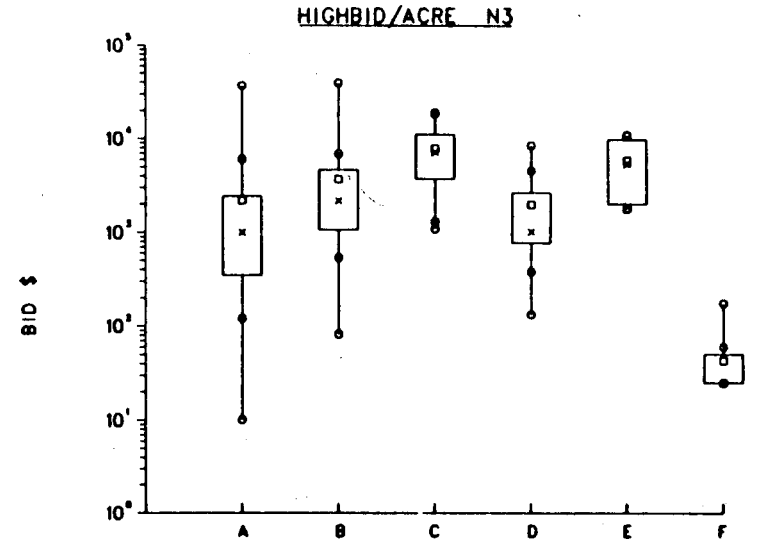
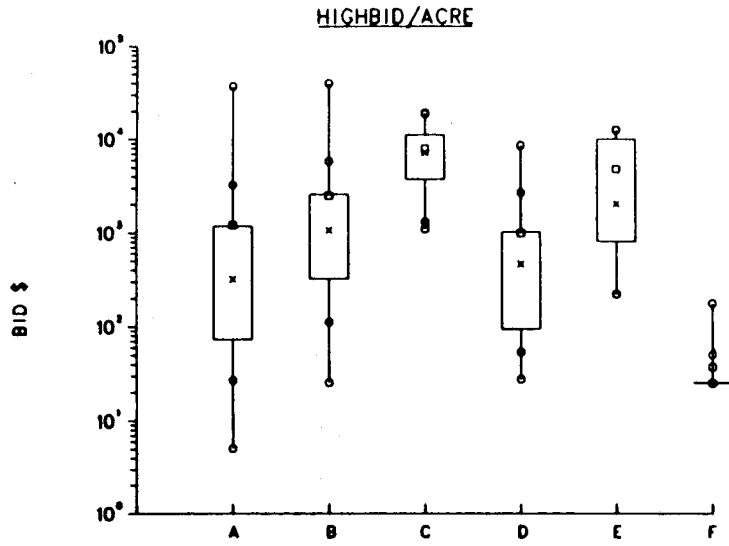


Fig. 9. Distribution of high bid/acre by leasing method. (Nominal Dollars)

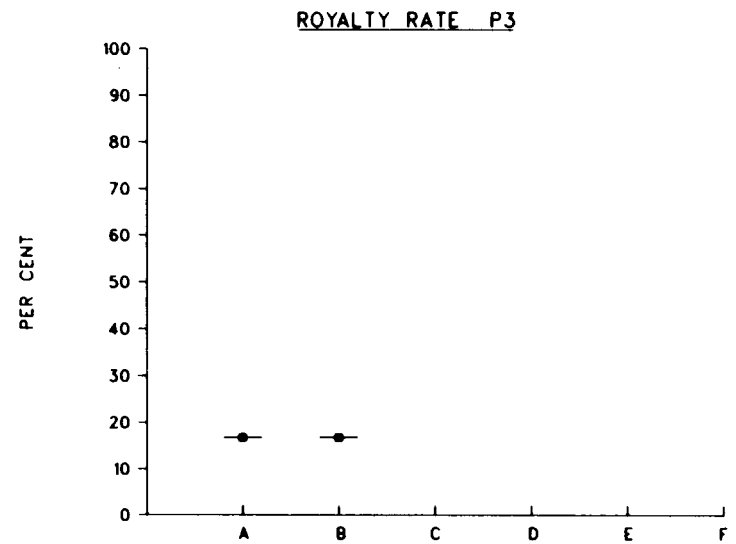
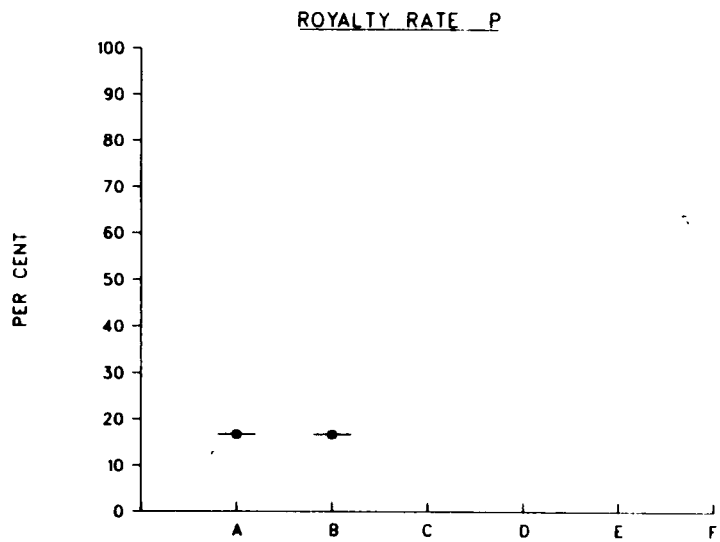
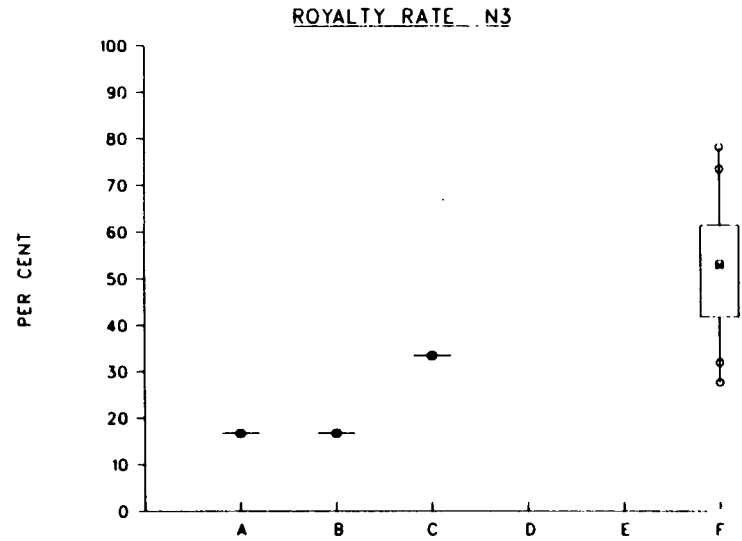
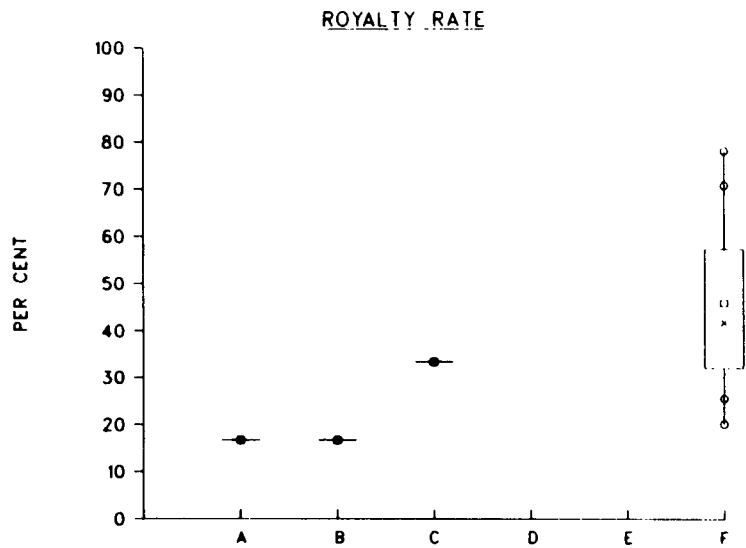


Fig. 10. Distribution of royalty rate by leasing method.

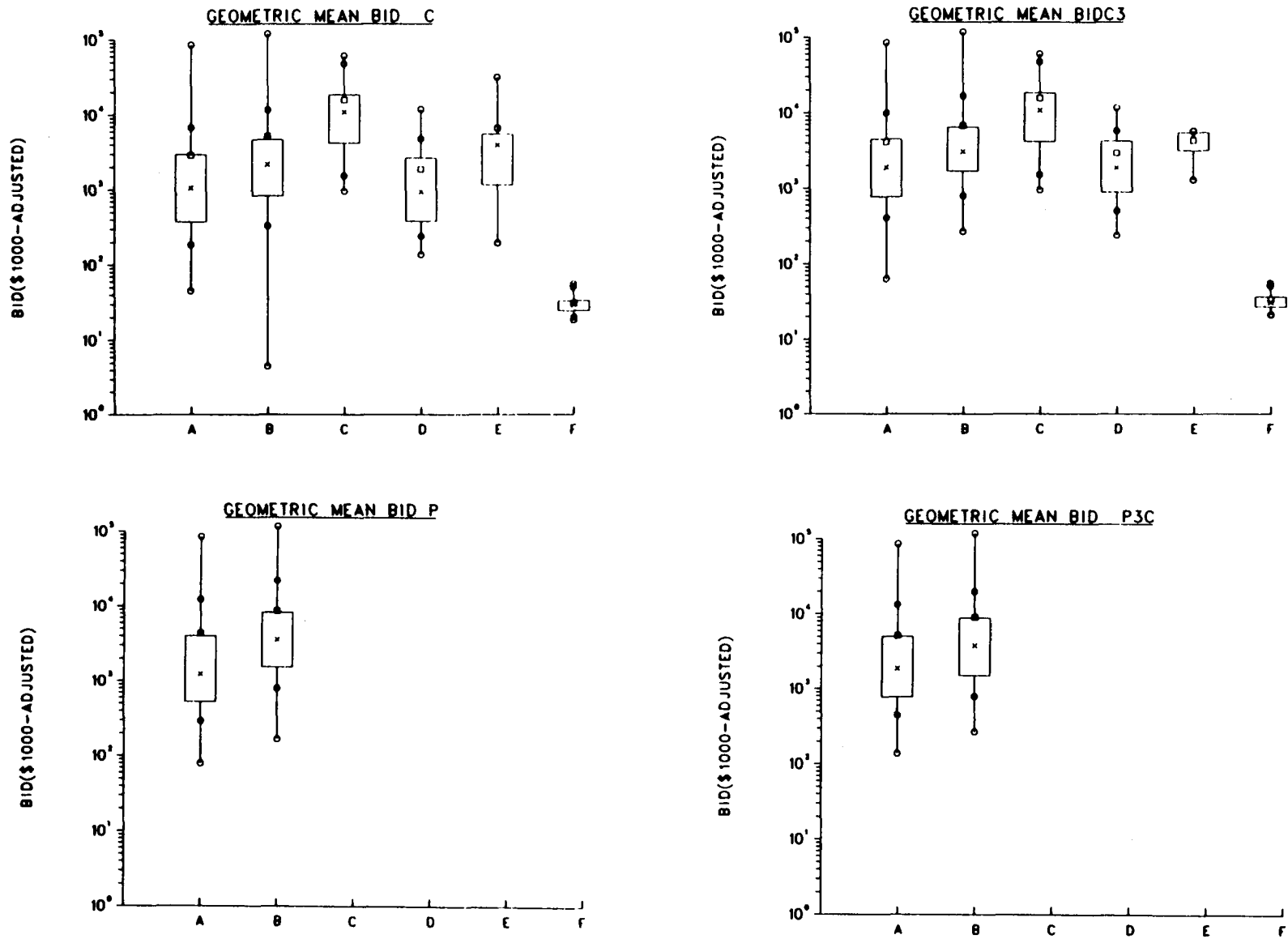


Fig. 11. Distribution of the geometric mean bid by leasing method. (Constant Dollars)

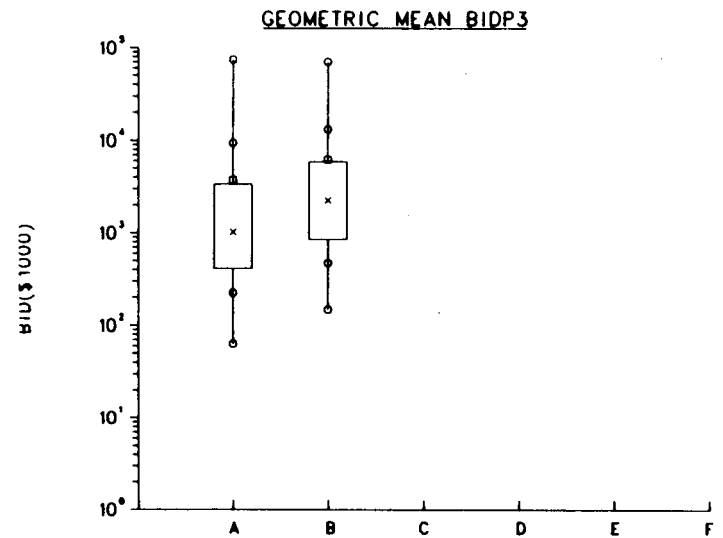
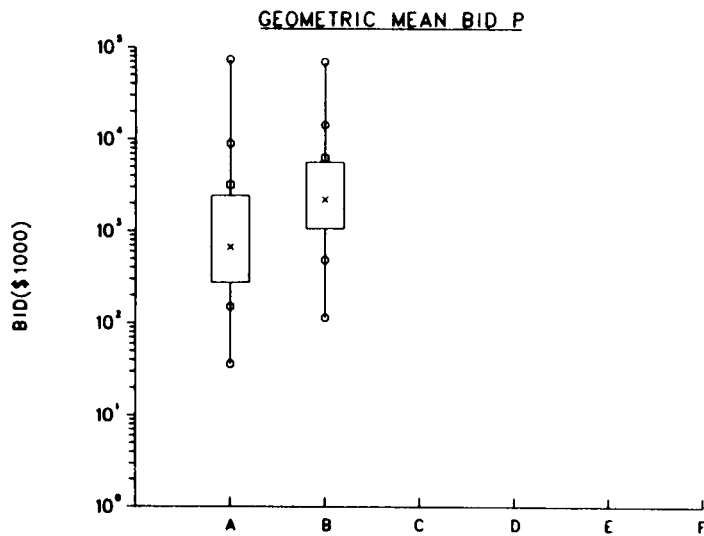
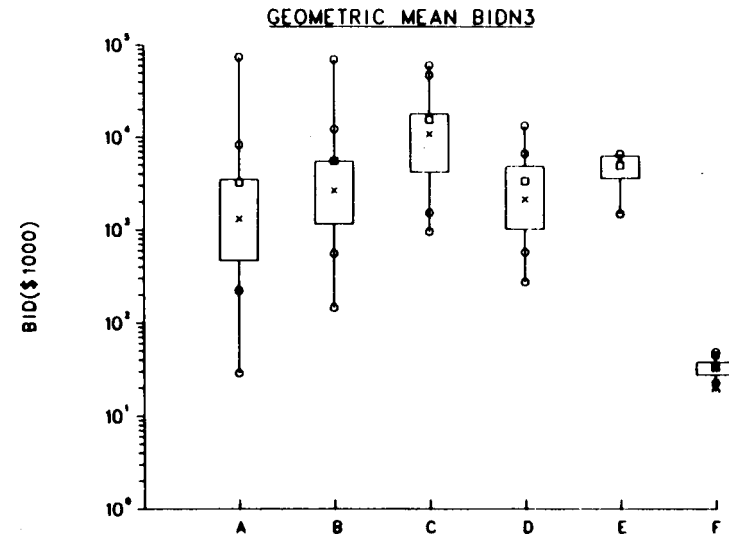
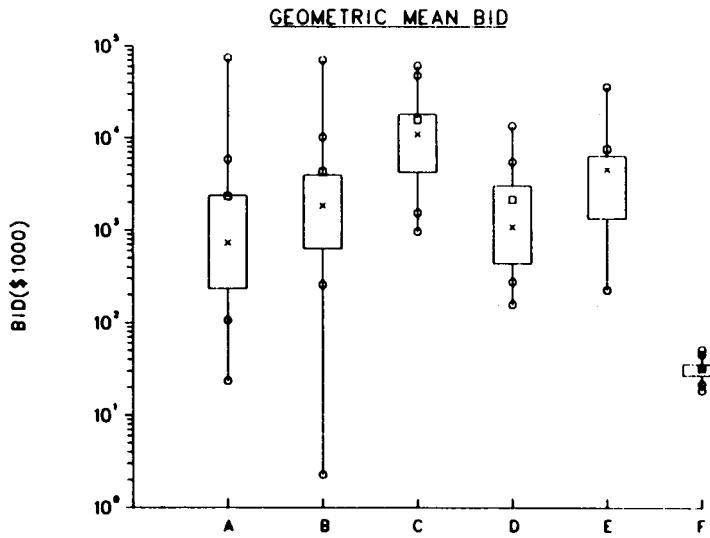


Fig. 12. Distribution of the geometric mean bid by leasing method. (Nominal Dollars)

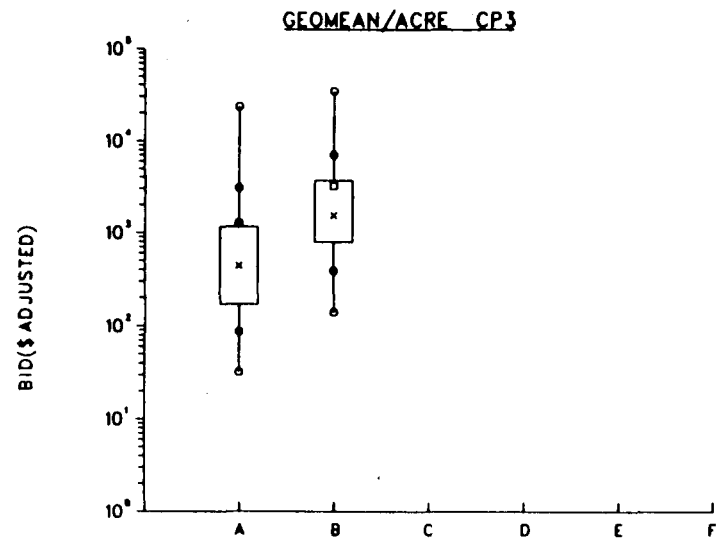
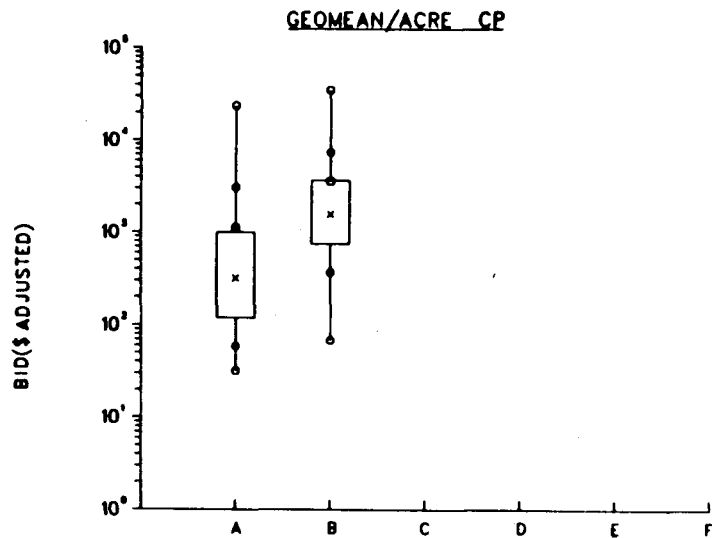
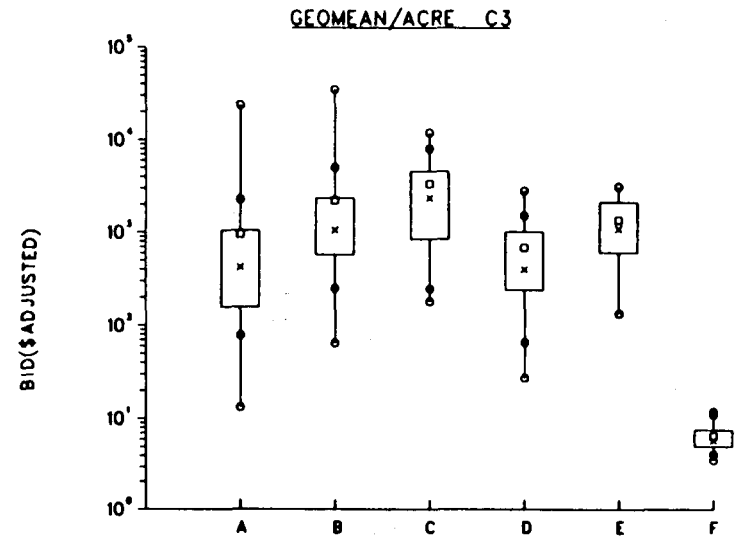
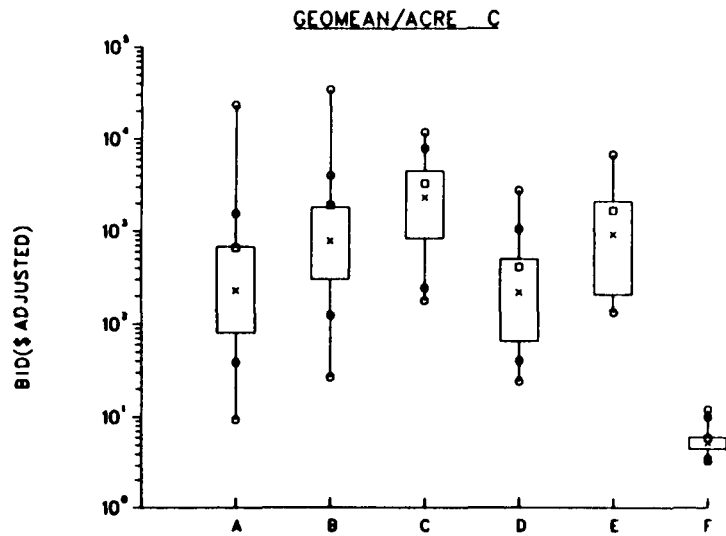


Fig. 13. Distribution of the geometric mean bid/acre by leasing method. (Constant Dollars)

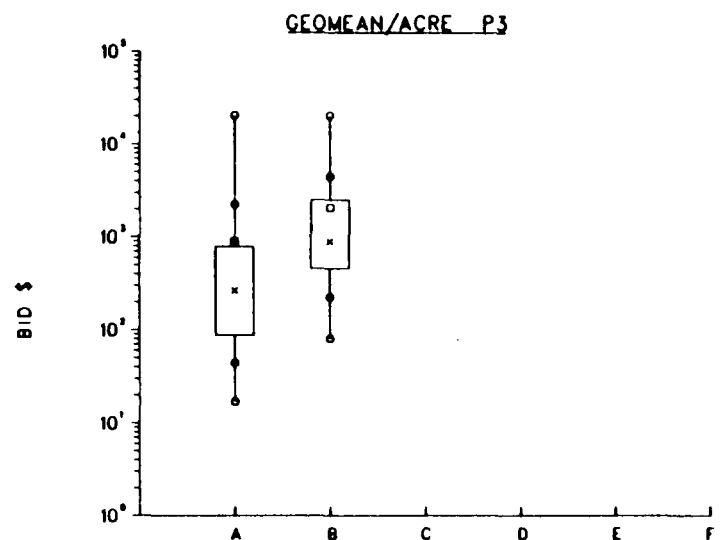
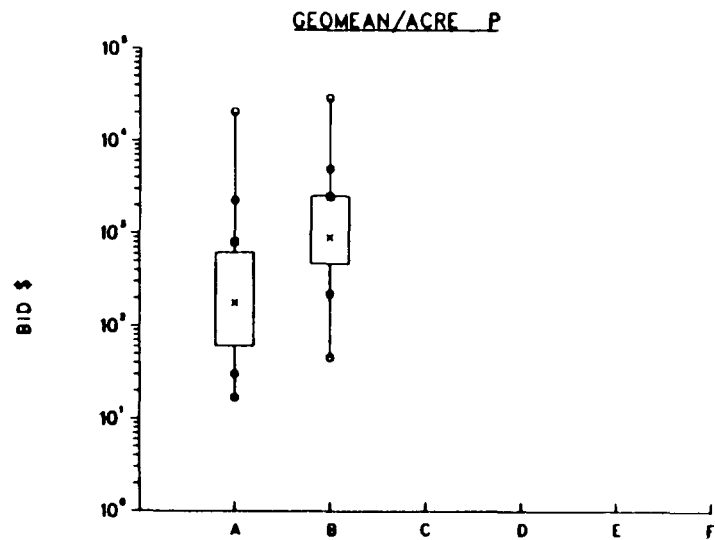
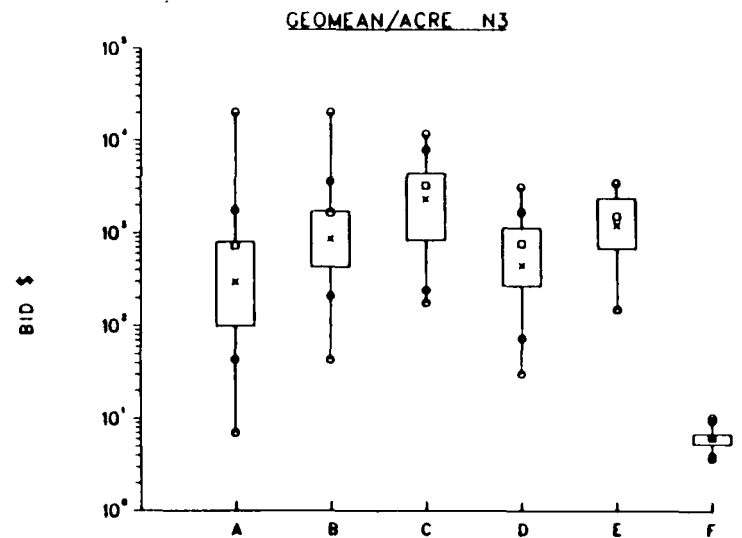
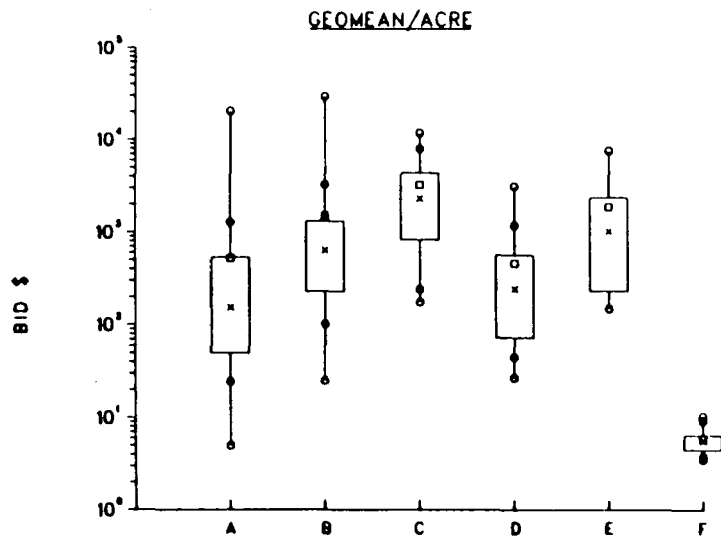


Fig. 14. Distribution of geometric mean bid/acre by leasing method. (Nominal Dollars)

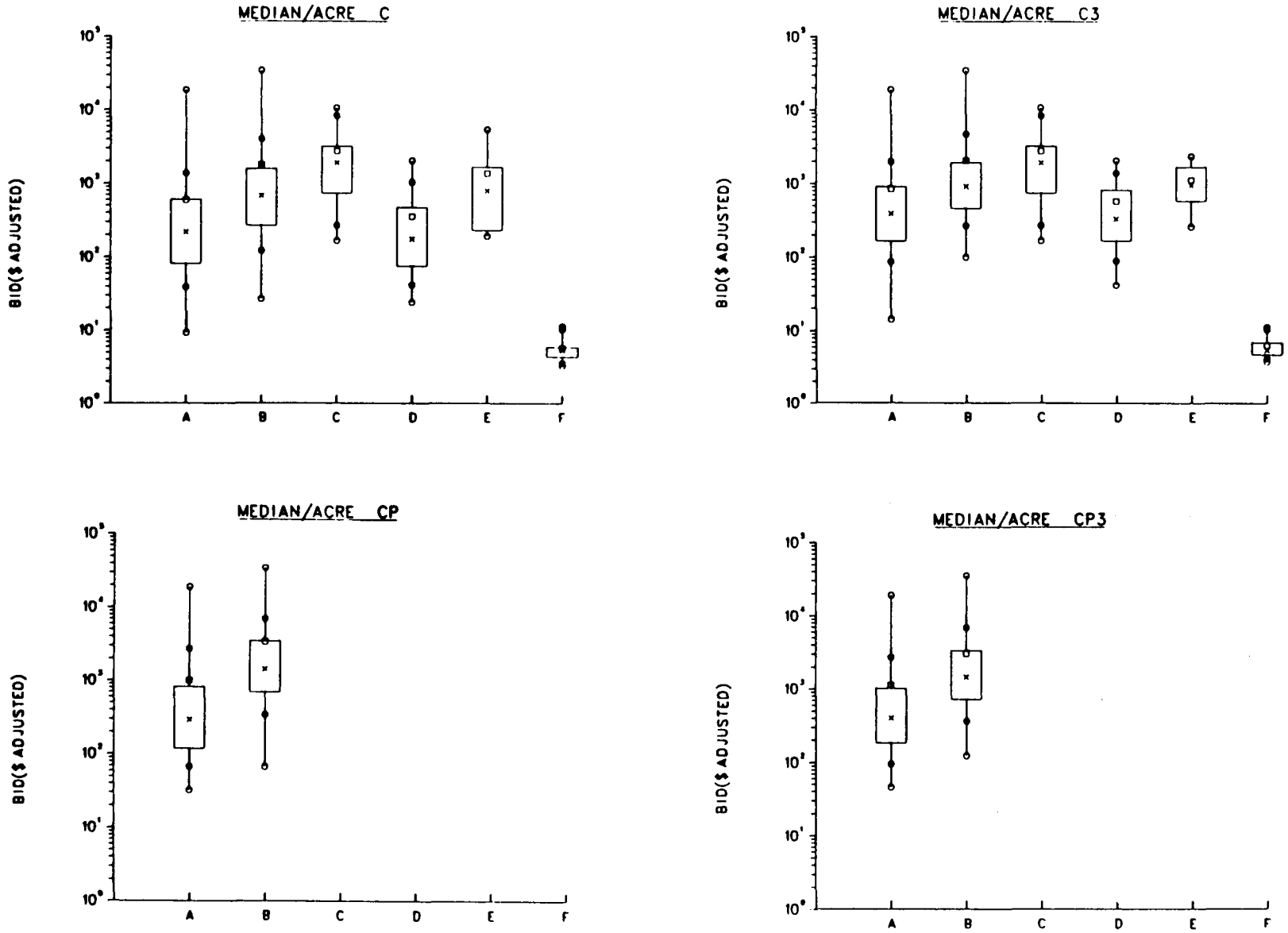


Fig. 15. Distribution of the median bid/acre by leasing method. (Constant Dollars)

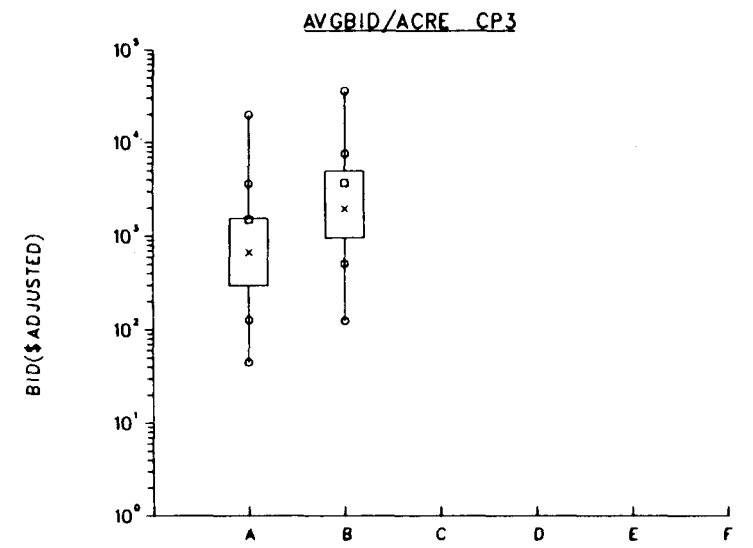
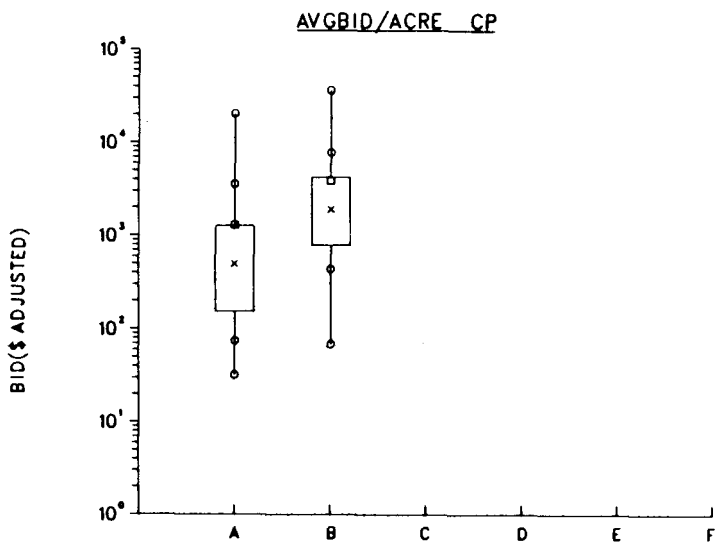
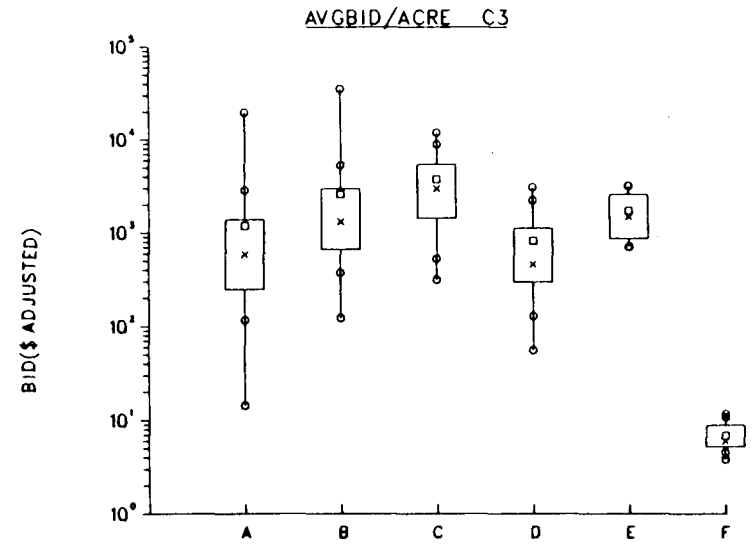
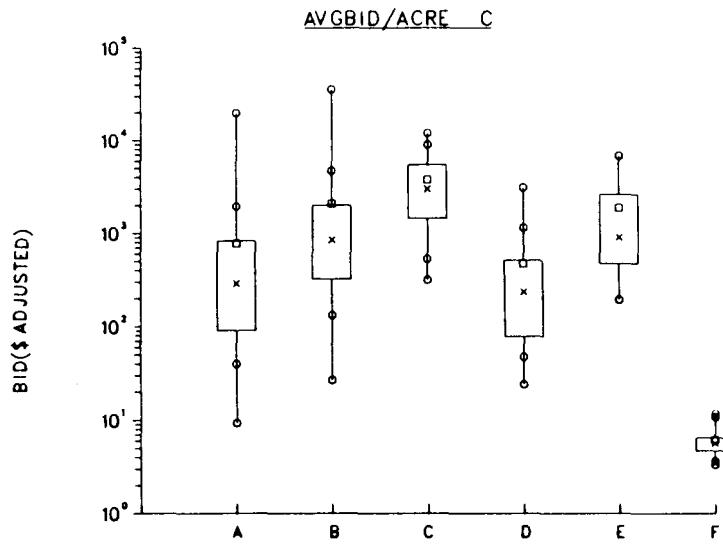


Fig. 16. Distribution of average bid/acre by leasing method. (Constant Dollars)

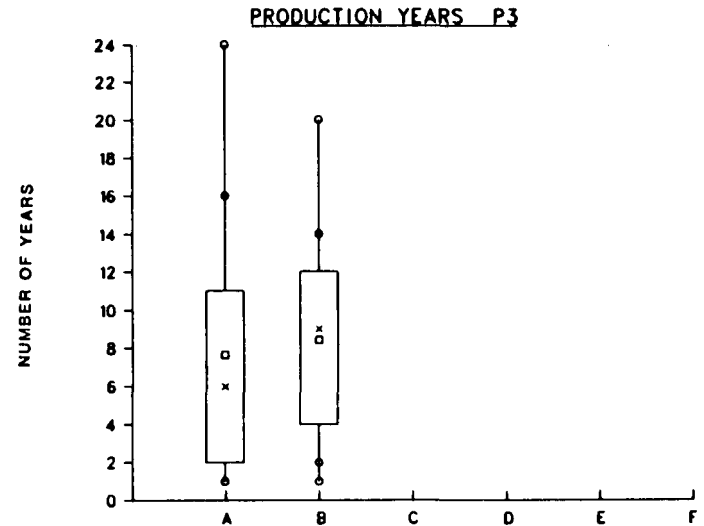
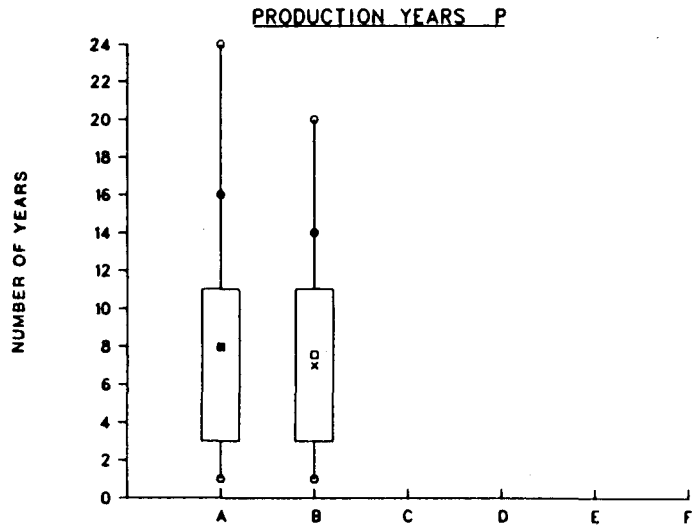
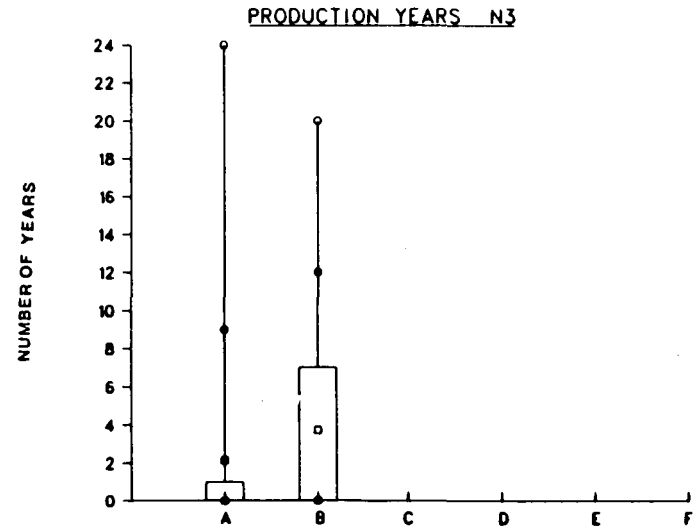
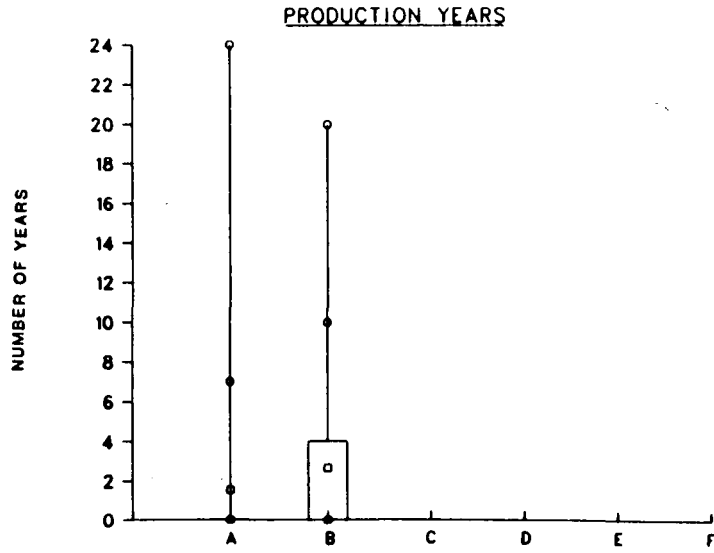


Fig. 17. Distribution of the number of production years by leasing method.

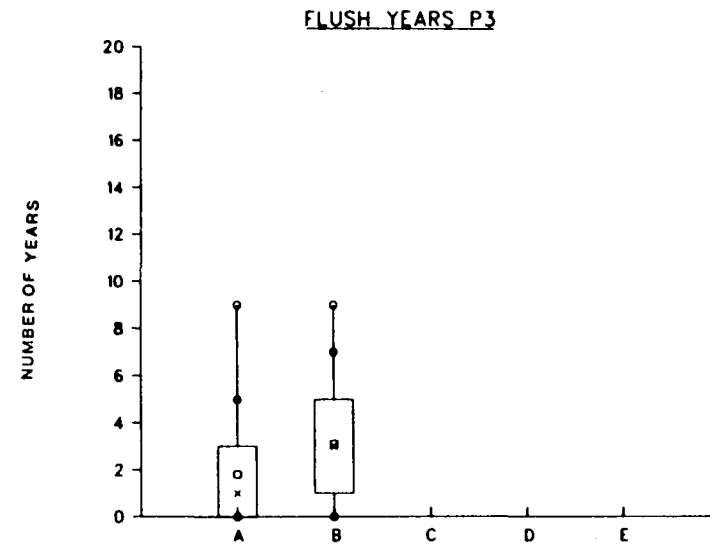
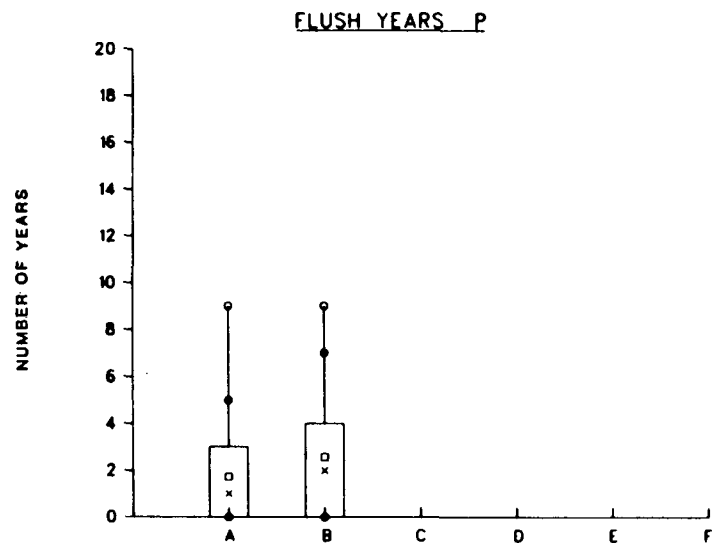
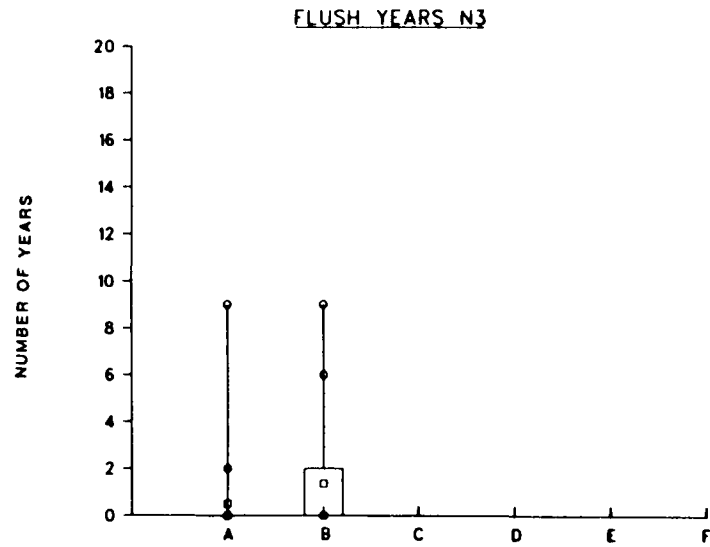
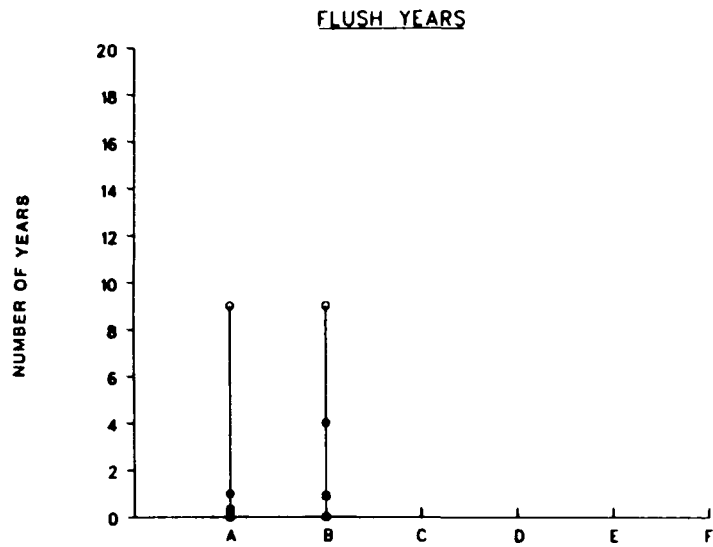


Fig. 18. Distribution of the number of years of flush production by leasing method.

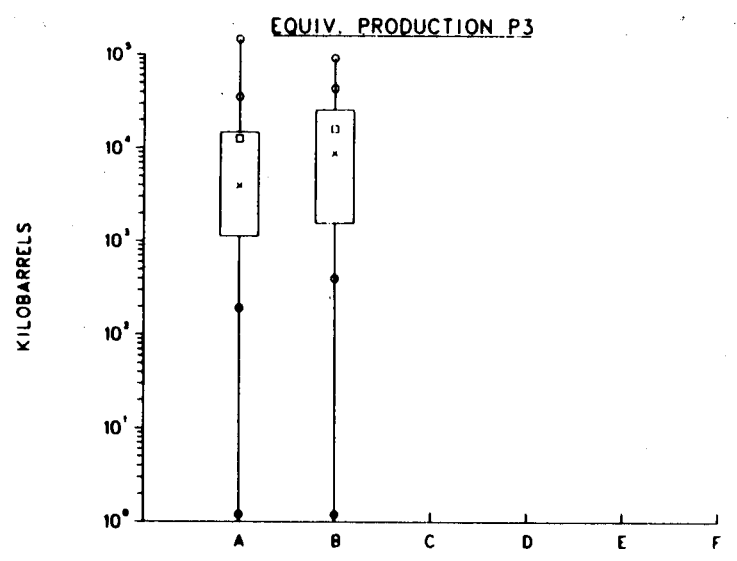
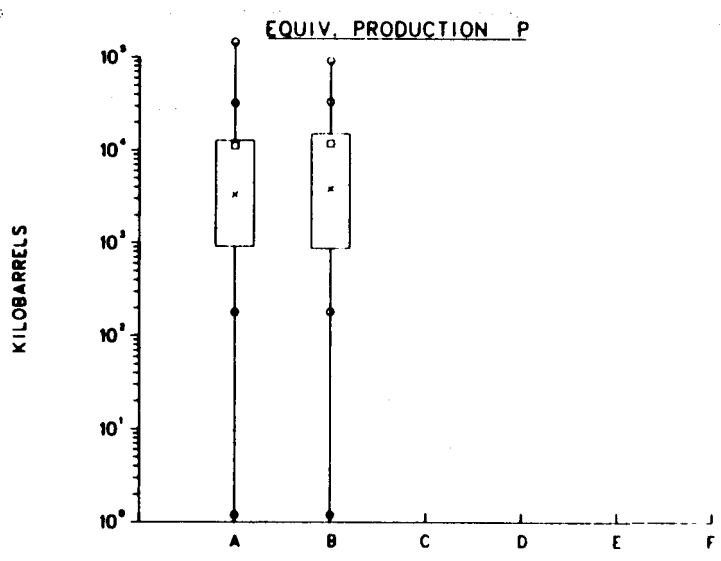
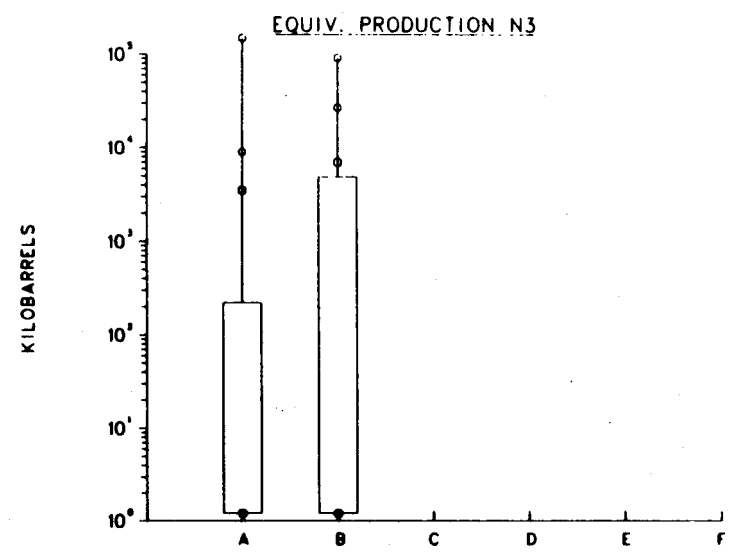
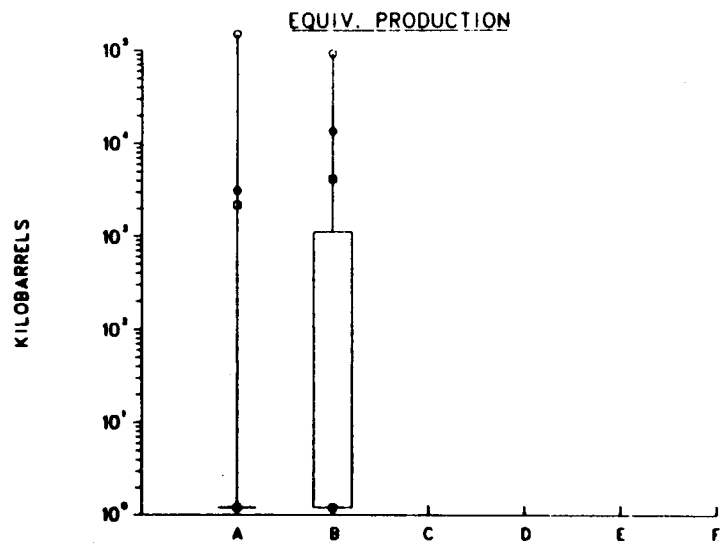


Fig. 19. Distribution of equivalent production by leasing method.

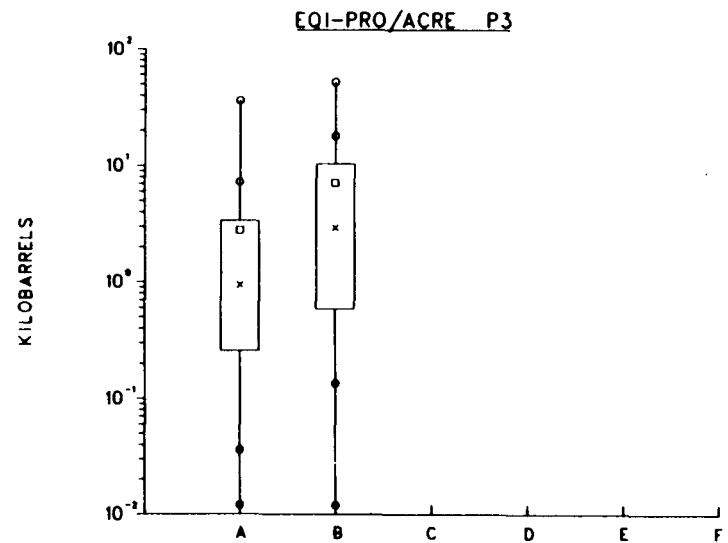
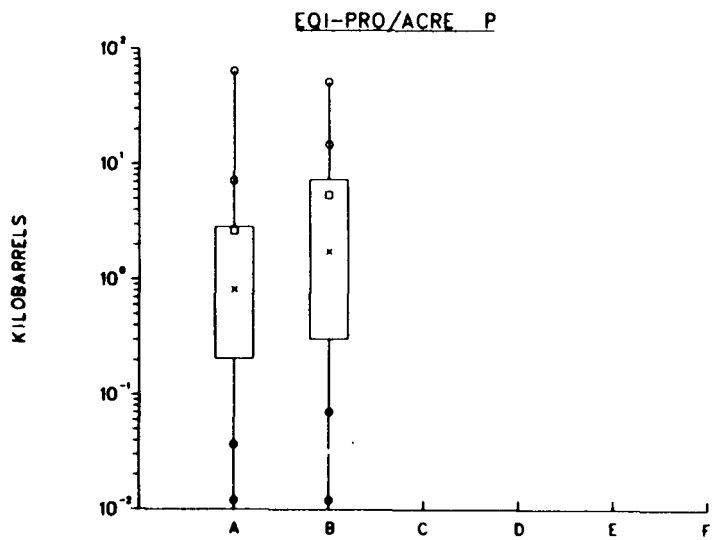
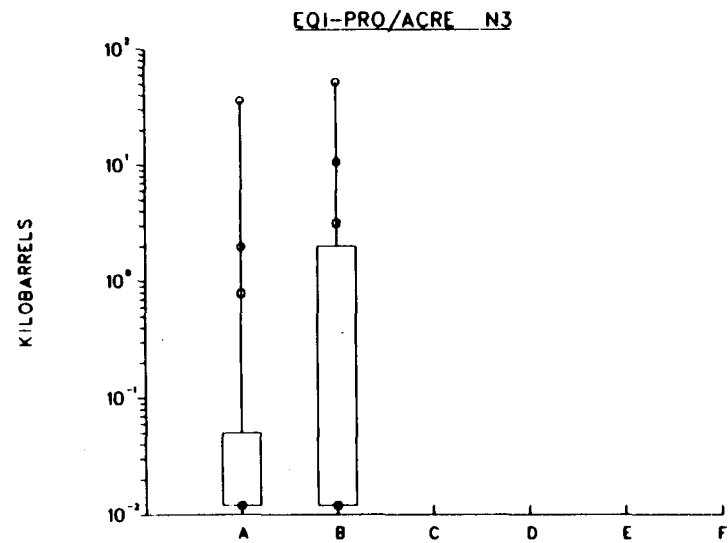
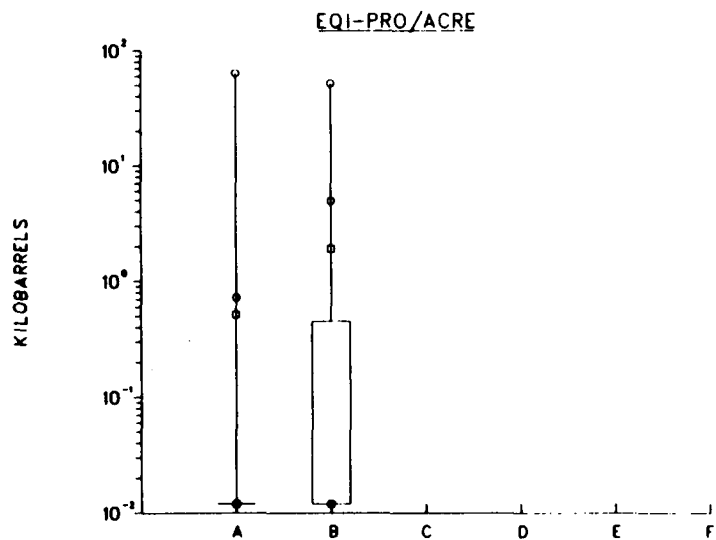


Fig. 20. Distribution of equivalent production/acre by leasing method.

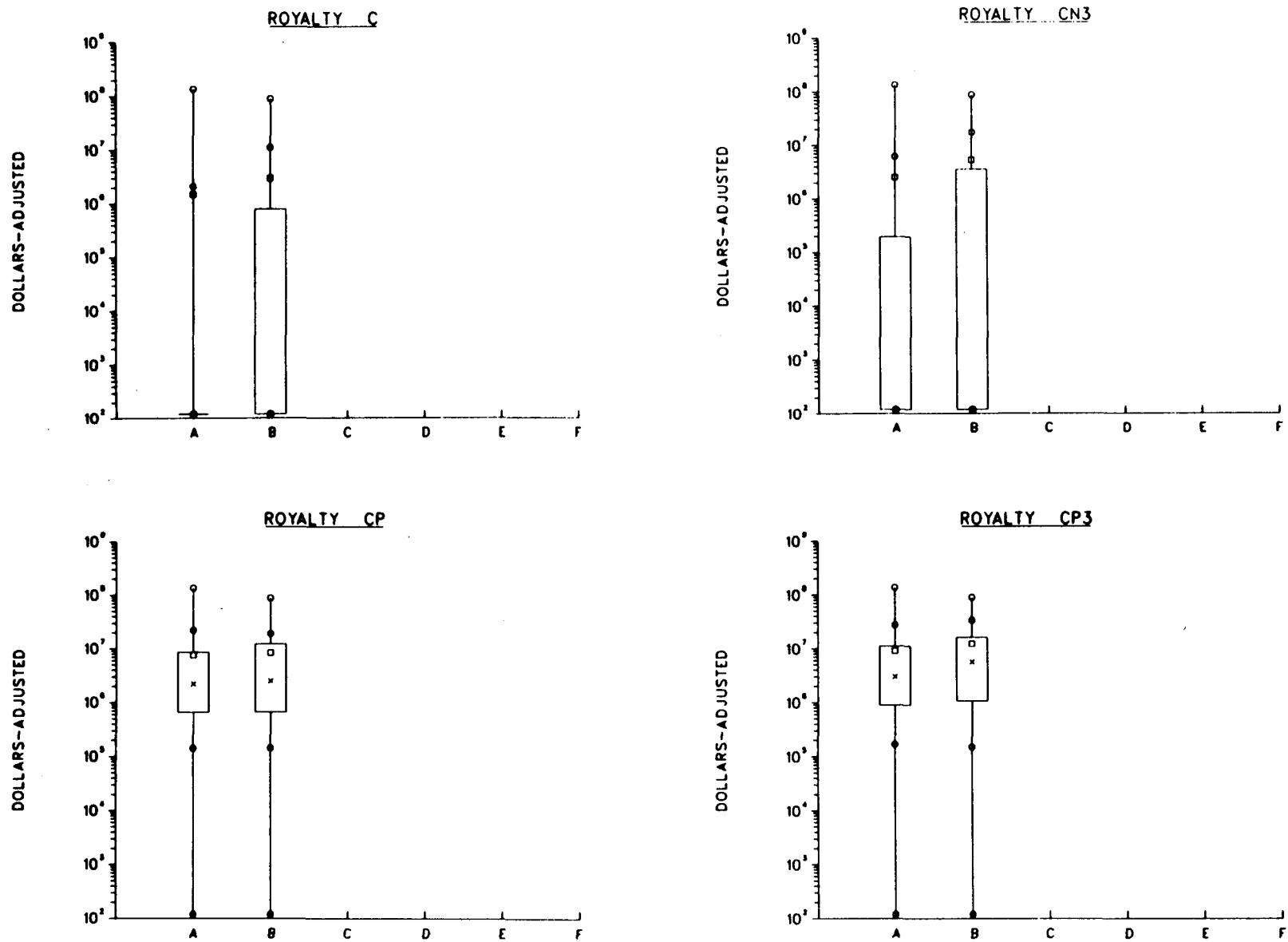


Fig. 21. Distribution of royalty by leasing method. (Constant Dollars)

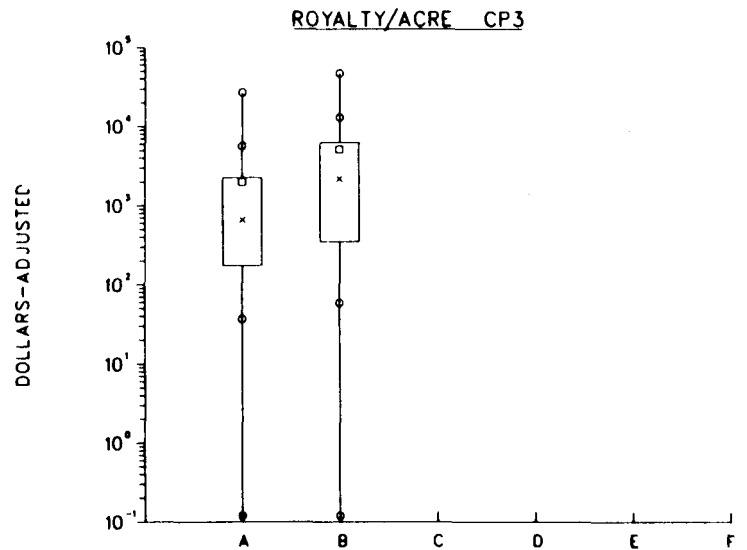
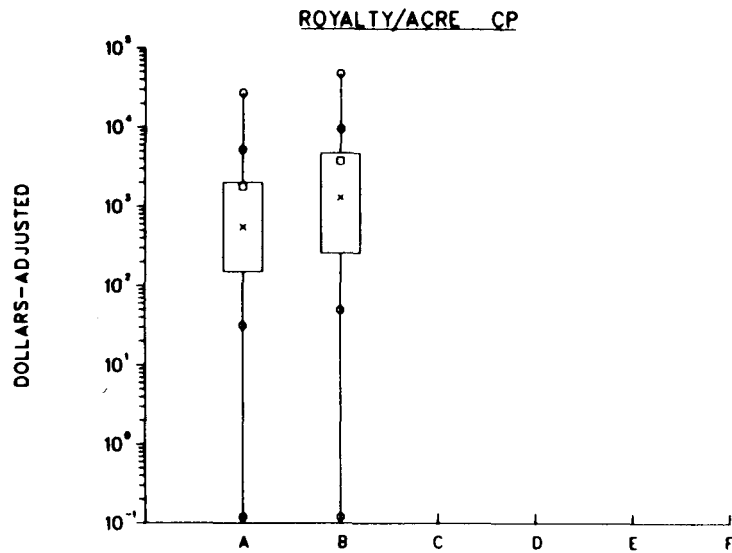
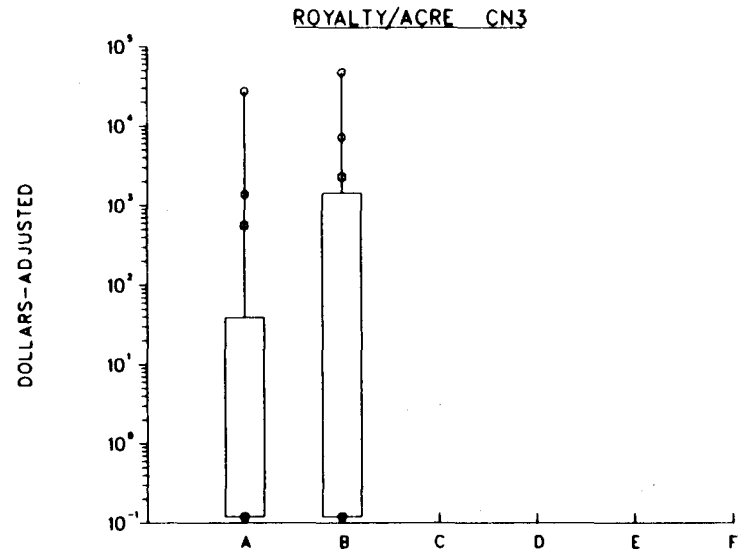
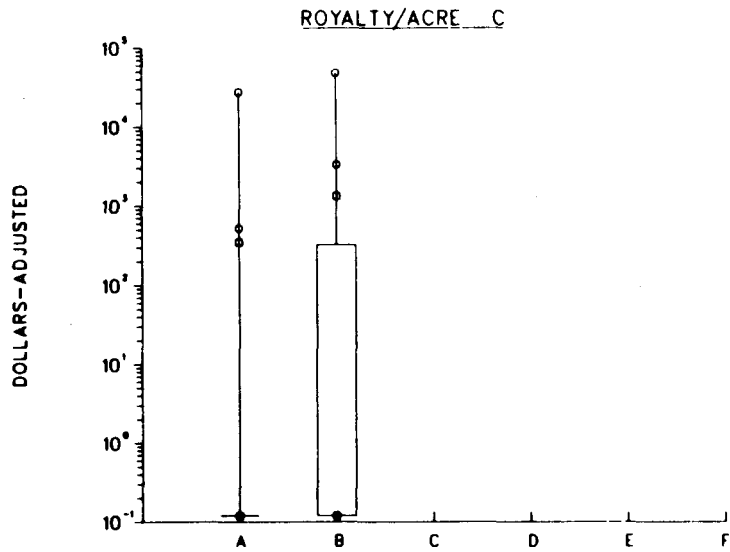


Fig. 22. Distribution of royalty/acre by leasing method. (Constant Dollars)

APPENDIX A

This appendix contains detailed tables on the numbers of leases bid on and issued for the various lease categories by state and sale date. For all tables, tracts on which the bids were rejected are indicated by an asterisk in the REJ column. A blank indicates that the corresponding number of leases were issued. Thus, in Table A-1 in the December 20, 1973 sale, 13 tracts off Alabama were issued while one additional tract was bid on but not leased.

TABLE A-1

THE DISTRIBUTION OF BW6 LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ	FREQUENCY	STATE	SALE DATE	REJ
13	AL	12/20/1973		119	LA	12/15/1970	
1	AL	12/20/1973	*	8	LA	12/15/1970	*
7	AL	03/28/1974		62	LA	09/12/1972	
2	AL	03/28/1974	*	12	LA	09/12/1972	*
2	AL	07/30/1974	*	116	LA	12/19/1972	
15	AL	10/16/1974		3	LA	12/19/1972	*
5	AL	05/28/1975		70	LA	03/28/1974	
57	CA	05/14/1963		15	LA	03/28/1974	*
1	CA	05/14/1963	*	1	LA	05/29/1974	
71	CA	02/06/1968		9	LA	07/30/1974	
4	CA	02/06/1968	*	6	LA	07/30/1974	*
53	CA	12/11/1975		112	LA	10/16/1974	
14	CA	12/11/1975	*	11	LA	10/16/1974	*
20	DE	08/17/1976		58	LA	05/28/1975	
2	DE	08/17/1976	*	9	LA	05/28/1975	*
23	FA	05/26/1959		34	LA	07/29/1975	
62	FA	12/20/1973		7	LA	07/29/1975	*
1	FA	12/20/1973	*	8	LA	02/18/1976	
4	FA	02/18/1976		1	LA	02/18/1976	*
6	FA	03/28/1978		58	LA	06/23/1977	
25	FA	10/31/1978		13	LA	06/23/1977	*
6	GA	03/28/1978		16	LA	04/25/1978	
5	GA	03/28/1978	*	2	LA	04/25/1978	*
90	LA	10/13/1954		22	LA	12/19/1978	
94	LA	07/12/1955		1	LA	12/19/1978	*
99	LA	02/24/1960		60	NJ	08/17/1976	
26	LA	02/24/1960	*	4	NJ	08/17/1976	*
206	LA	03/13/1962		74	OR	10/01/1964	
5	LA	03/13/1962	*	19	TX	11/09/1954	
195	LA	03/16/1962		27	TX	07/12/1955	
5	LA	03/16/1962	*	48	TX	02/24/1960	
158	LA	06/13/1967		10	TX	03/16/1962	
14	LA	06/13/1967	*	110	TX	05/21/1968	

TABLE A-1 (Cont)

THE DISTRIBUTION OF BW6 LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ
31	TX	05/21/1968	*
96	TX	06/19/1973	
3	TX	06/19/1973	*
101	TX	05/29/1974	
20	TX	05/29/1974	*
10	TX	07/30/1974	
17	TX	07/30/1974	*
110	TX	02/04/1975	
28	TX	02/04/1975	*
9	TX	05/28/1975	
3	TX	05/28/1975	*
20	TX	07/29/1975	
3	TX	07/29/1975	*
7	TX	02/18/1976	
22	TX	06/23/1977	
1	TX	06/23/1977	*
19	TX	04/25/1978	
1	TX	04/25/1978	*
11	TX	12/19/1978	
1	TX	12/19/1978	*
27	WA	10/01/1964	
76	AK	04/13/1976	
5	AK	04/13/1976	*
57	AK	10/27/1977	
4	AK	10/27/1977	*

 91 UNIQUE VALUE TRIPLES

3098 OCCURRENCES

TABLE A-2

THE DISTRIBUTION OF BD6 LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ	FREQUENCY	STATE	SALE DATE	REJ
9	AL	12/20/1973		2	TX	02/04/1975	*
1	AL	10/16/1974		3	TX	07/29/1975	
1	AL	11/16/1976	*	3	TX	07/29/1975	*
1	CA	12/15/1966		5	TX	02/18/1976	
3	FA	12/20/1973		1	TX	02/18/1976	*
19	LA	08/11/1959		4	TX	11/16/1976	
9	LA	10/09/1962		2	TX	11/16/1976	*
5	LA	10/09/1962	*	5	TX	06/23/1977	
23	LA	04/28/1964		2	TX	06/23/1977	*
17	LA	03/29/1966		9	TX	04/25/1978	
1	LA	03/29/1966	*	4	TX	04/25/1978	*
24	LA	10/18/1966		1	TX	12/19/1978	
8	LA	10/18/1966	*	1	TX	12/19/1978	*
16	LA	11/19/1968					
5	LA	11/19/1968	*	-----			
20	LA	01/14/1969		59 UNIQUE VALUE TRIPLES			
6	LA	01/14/1969	*	-----			
16	LA	12/16/1969		492 OCCURRENCES			
19	LA	07/21/1970					
2	LA	07/21/1970	*				
11	LA	11/04/1971					
2	LA	11/04/1971	*				
4	LA	06/19/1973					
1	LA	06/19/1973	*				
14	LA	03/28/1974					
6	LA	03/28/1974	*				
4	LA	07/30/1974	*				
8	LA	10/16/1974					
2	LA	10/16/1974	*				
14	LA	05/28/1975					
4	LA	05/28/1975	*				
9	LA	07/29/1975					
1	LA	07/29/1975	*				
10	LA	02/18/1976					
5	LA	02/18/1976	*				
39	LA	11/16/1976					
2	LA	11/16/1976	*				
39	LA	06/23/1977					
12	LA	06/23/1977	*				
36	LA	04/25/1978					
4	LA	04/25/1978	*				
11	LA	12/19/1978					
2	LA	12/19/1978	*				
1	TX	05/29/1974	*				
1	TX	07/30/1974	*				
3	TX	02/04/1975					

TABLE A-3

THE DISTRIBUTION OF BW3 LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ
3	CA	12/11/1975	
5	DE	08/17/1976	
1	DE	08/17/1976	*
8	NJ	08/17/1976	
1	NJ	08/17/1976	*

5 UNIQUE VALUE TRIPLES			

18 OCCURRENCES			

TABLE A-4

THE DISTRIBUTION OF BWS LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ
31	FA	03/28/1978	
5	FA	03/28/1978	*
10	FA	10/31/1978	
4	GA	03/28/1978	*
4	LA	04/25/1978	
16	LA	12/19/1978	
3	TX	04/25/1978	
15	TX	12/19/1978	

8 UNIQUE VALUE TRIPLES			

88 OCCURRENCES			

TABLE A-5

THE DISTRIBUTION OF BDS LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ
1	LA	04/25/1978	
3	LA	12/19/1978	
1	LA	12/19/1978	*
2	TX	04/25/1978	
2	TX	12/19/1978	
1	TX	12/19/1978	*

6 UNIQUE VALUE TRIPLES			

10 OCCURRENCES			

TABLE A-6

THE DISTRIBUTION OF ROY LEASES BY STATE AND SALE DATE

FREQUENCY	STATE	SALE DATE	REJ
1	AL	10/16/1974	
7	LA	10/16/1974	
30	AK	10/27/1977	

3 UNIQUE VALUE TRIPLES			

38 OCCURRENCES			

APPENDIX B

TABLE B-1

THE 1979 OCS SALES
(The number of offered, bid-on, and issued leases by Sale Date and State)

Sale Date	State(s)	Royalty					
		Fixed			Sliding Scale		
		Offered	Bid-On	Issued	Offered	Bid-On	Issued
2/28/79	DE,NJ,MD	58	20	16	51	24	23
6/29/79	CA	74 ^a	26	26	74 ^a	29	28
7/31/79	LA,TX	70 ^a	53	49	53 ^a	35	32
11/27/79	LA,TX	73	61	57	51	35	33
12/11/79	AK	--	--	--	46	25	0 ^b
12/18/79	MA, NY	61	33	28	55	40	35

^aApproximate values

^bNone of these leases have been issued because of court decisions on environmental and other issues. According to the Oil and Gas Journal 24 leases should be issued soon. (July 21, 1980, p. 29).

APPENDIX C

TABLE C-1

IMPLICIT PRICE DEFLATORS BY YEAR

<u>Year</u>	<u>Implicit Price Deflators</u>
1954	0.446
1955	0.455
1956	0.470
1957	0.486
1958	0.493
1959	0.504
1960	0.513
1961	0.517
1962	0.527
1963	0.535
1964	0.543
1965	0.555
1966	0.573
1967	0.590
1968	0.617
1969	0.648
1970	0.682
1971	0.717
1972	0.747
1973	0.790
1974	0.866
1975	0.950
1976	1.000
1977	1.059
1978	1.137

SOURCE: Historical Review of Domestic Oil and Gas Exploratory Activity, Energy Information Administration, US Department of Energy, DOE/EIA-0196, Oct. 1979.