

## PHOSPHORUS RATE AND FREQUENCY TRIAL

Yuba Co. - Robert Brumbaugh Ranch  
Charles B. Wilson, Farm Advisor  
Roland D. Meyer, Soils Specialist

Objective: To define forage yield and quality response to different phosphorus rate and frequency regimes for the purpose of making economic decisions regarding fertilizer application.

Experimental Design:

Randomized complete block with three replications. Individual plot size = 10' x 15'. The following clover seed mixture was seeded at 25 lbs seed/A utilizing the PELINOC inoculation system with the PELGEL sticker.

<u>Clover</u>	<u>Percent by Weight</u>
Wooenellup-sub	20
Geraldton-sub	20
Dinninup-sub	15
Daliak-sub	10
Howard-sub	10
Hykon-rose	15
Kondinin-rose	10

Evaluations: Forage

- 1) Dry matter yields - 4-one ft sq quadrats.
- 2) Total N, Total P, Total S on above samples.

Soils

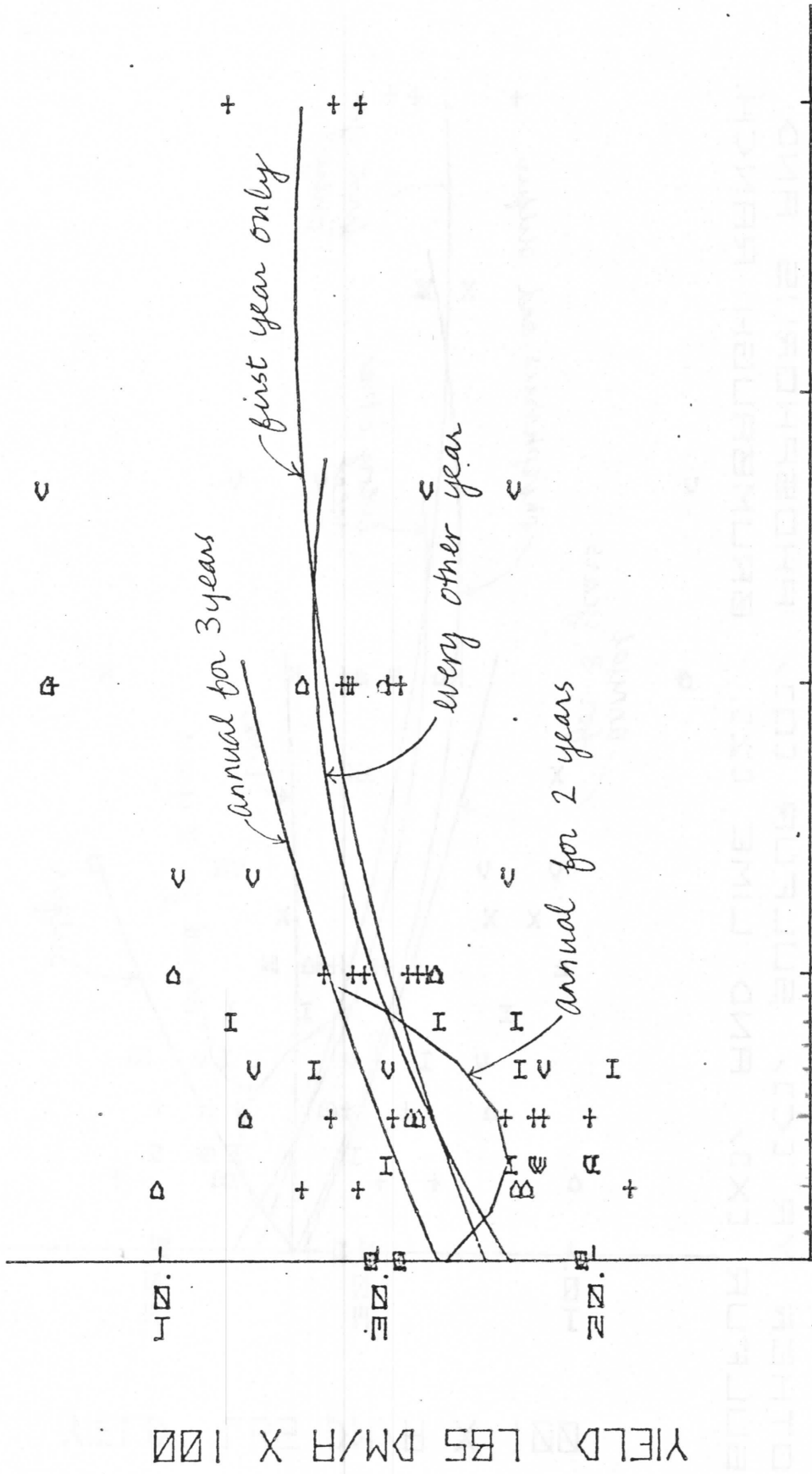
- 1) Initial samples from control plots. 2" increments to 6" depth: SP, pHs, ECe, Ca + Mg,  $\text{HCO}_3\text{-P}$ , Bray #1-P, K,  $\text{SO}_4\text{-S}$ .
- 2) All plots in spring of 1979, 1981 and 1983:  $\text{HCO}_3\text{-P}$ , Bray #1-P and  $\text{SO}_4\text{-S}$ .

Treatments: Application rates indicated are  
lbs. P<sub>2</sub>O<sub>5</sub>/A as treble superphosphate (0-45-0)

Treat- ment #	Fall 1977	Fall 1978	Fall 1979	Fall 1980	Fall 1981	Fall 1982	Total
1.	0						0
2.	30						30
3.	60						60
4.	120						120
5.	240						240
6.	5	5	5	5	5	5	30
7.	10	10	10	10	10	10	60
8.	20	20	20	20	20	20	120
9.	40	40	40	40	40	40	240
10.	10		10		10		30
11.	20		20		20		60
12.	40		40		40		120
13.	80		80		80		240
14.	15			15			30
15.	30			30			60
16.	60			60			120
17.	120			120			240
18.	15	5		5		5	30
19.	30	10		10		10	60
20.	45	5		5		5	60
21.	0+40*						0+40*
22.	0+80*						0+80*
23.	30+40*						30+40*
24.	60+40*						60+40*
25.	120+80*						120+80*
26.	1 ton lime						
27.	2 tons lime						

\* lbs S/A as gypsum

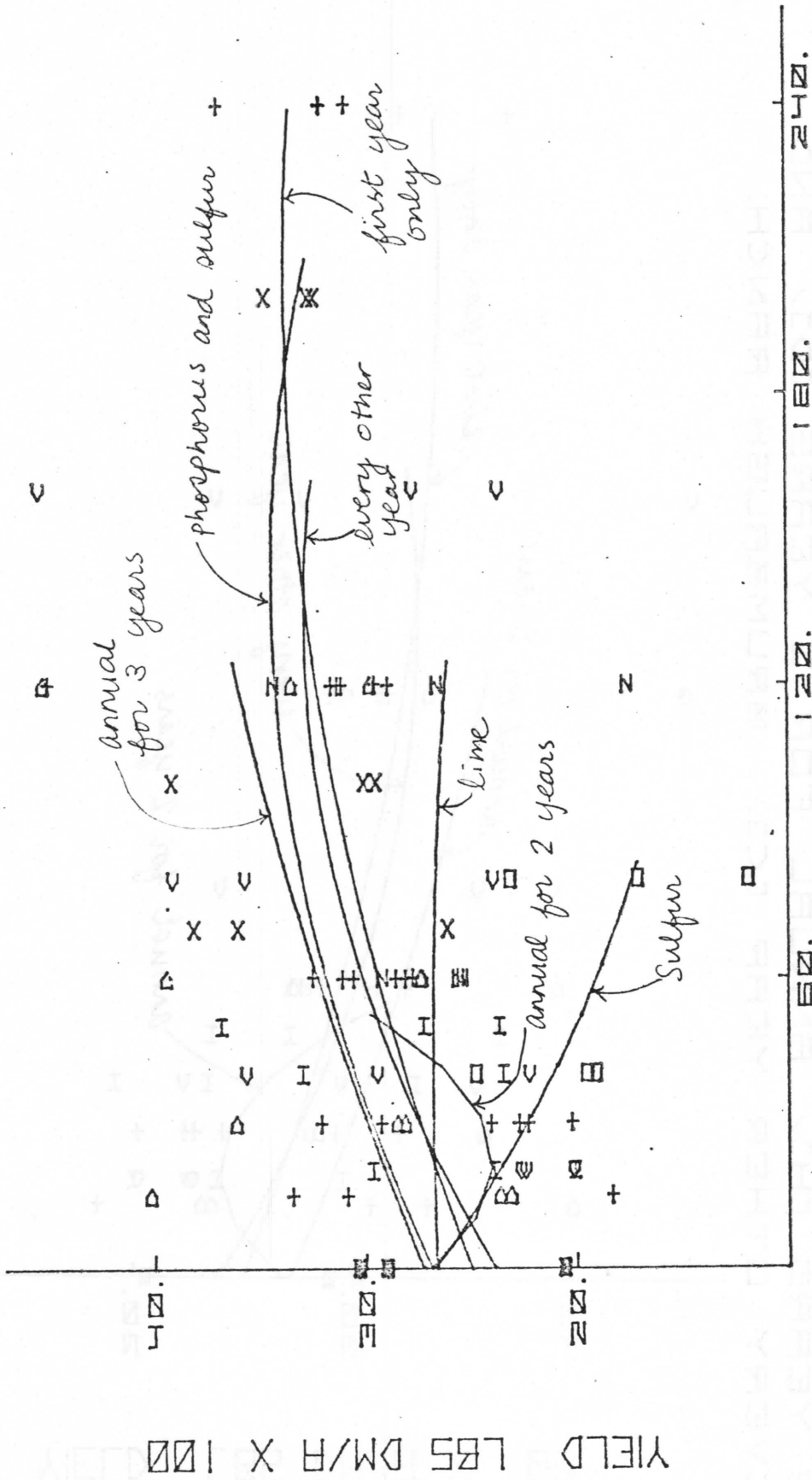
FORAGE YIELD RESPONSE IN 1980 TO APPLIED PHOSPHORUS, FIRST YEAR ONLY [+], ANNUAL FOR 2 YEARS [H], ANNUAL FOR 3 YEARS [O], AND EVERY OTHER YEAR [C]. BRUMBALGH RANCH.



100. 120. 140. 160. 180. 200. 220. 240.

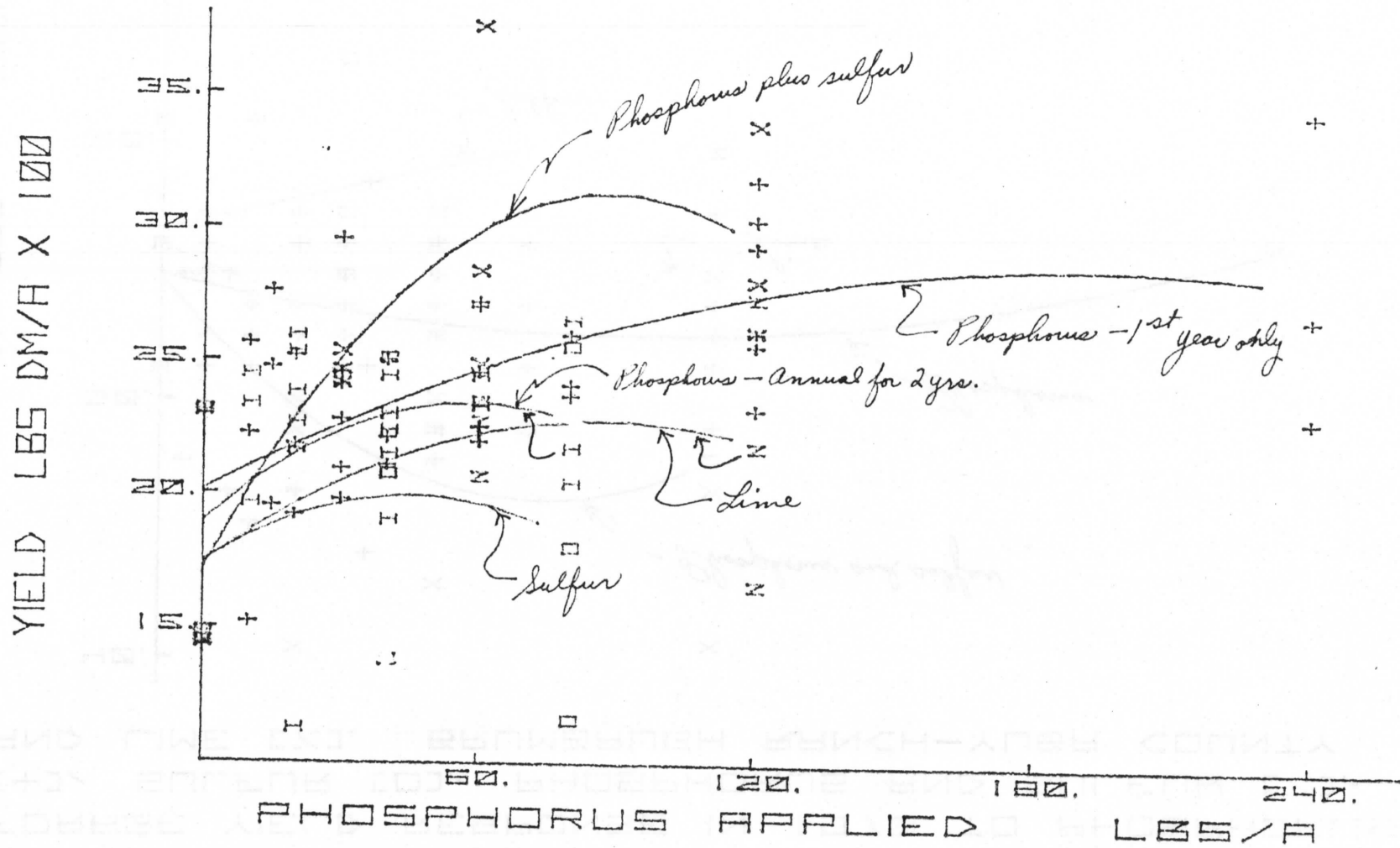
P APPLIED LESS P2O5/A

FORAGE YIELD RESPONSE IN 1980 TO APPLIED PHOSPHORUS, FIRST YEAR ONLY [+], ANNUAL FOR 2 YRS [CH], ANNUAL FOR 3 YRS [CD], EVERY OTHER YEAR [C], SULFUR [O], PHOSPHORUS AND SULFUR [CX], AND LIME [Z]. BRUMBROUGH RANCH.

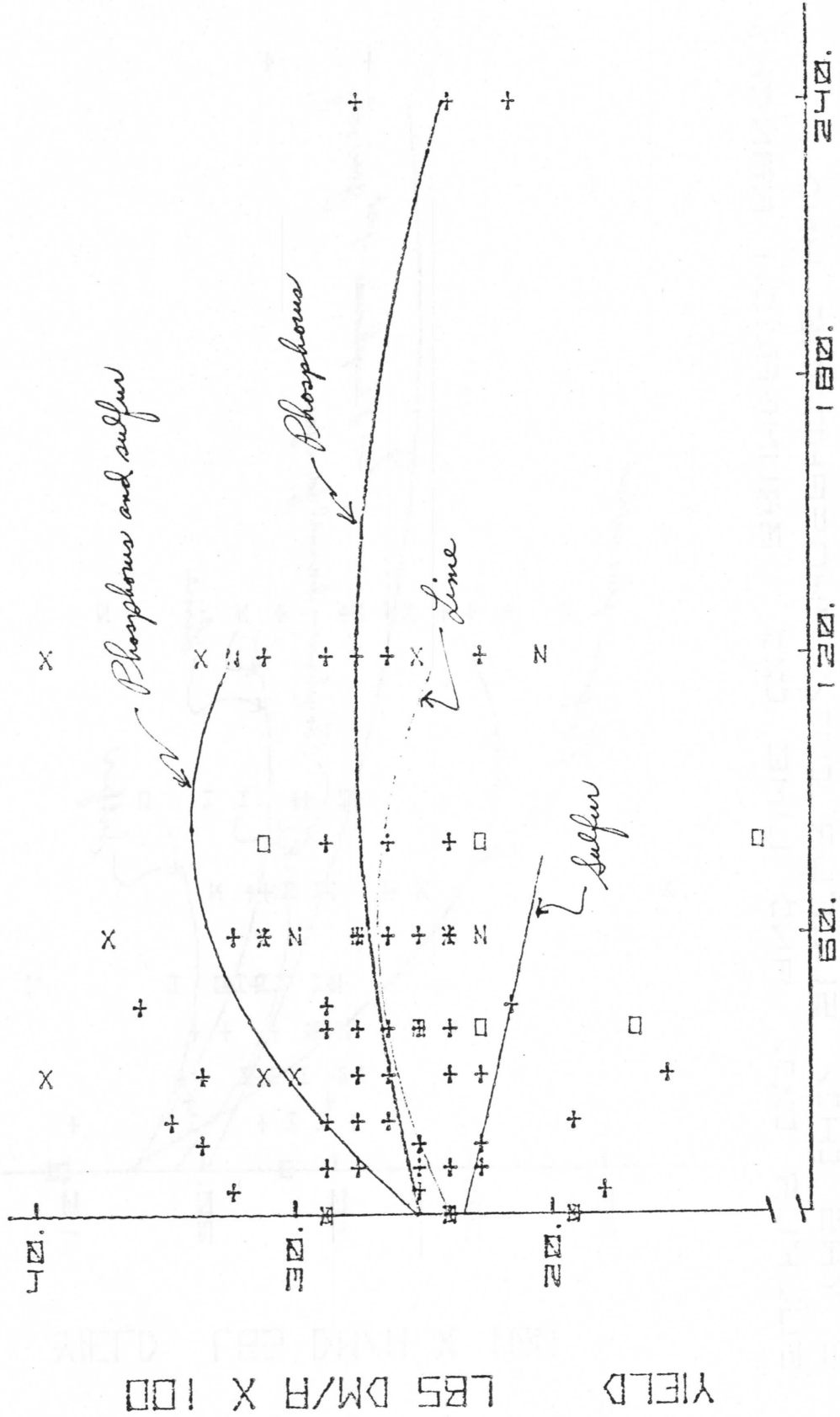


APPLIED P (LBS P<sub>2</sub>O<sub>5</sub>/A)

FORAGE YIELD RESPONSE IN 1979 TO APPLIED  
 PHOSPHORUS, FIRST YR ONLY (+), ANNUAL FOR  
 2 YRS (H), SULFUR (O), PHOSPHORUS AND  
 SULFUR (X), AND LIME (Z). BRUMBAUGH RANCH

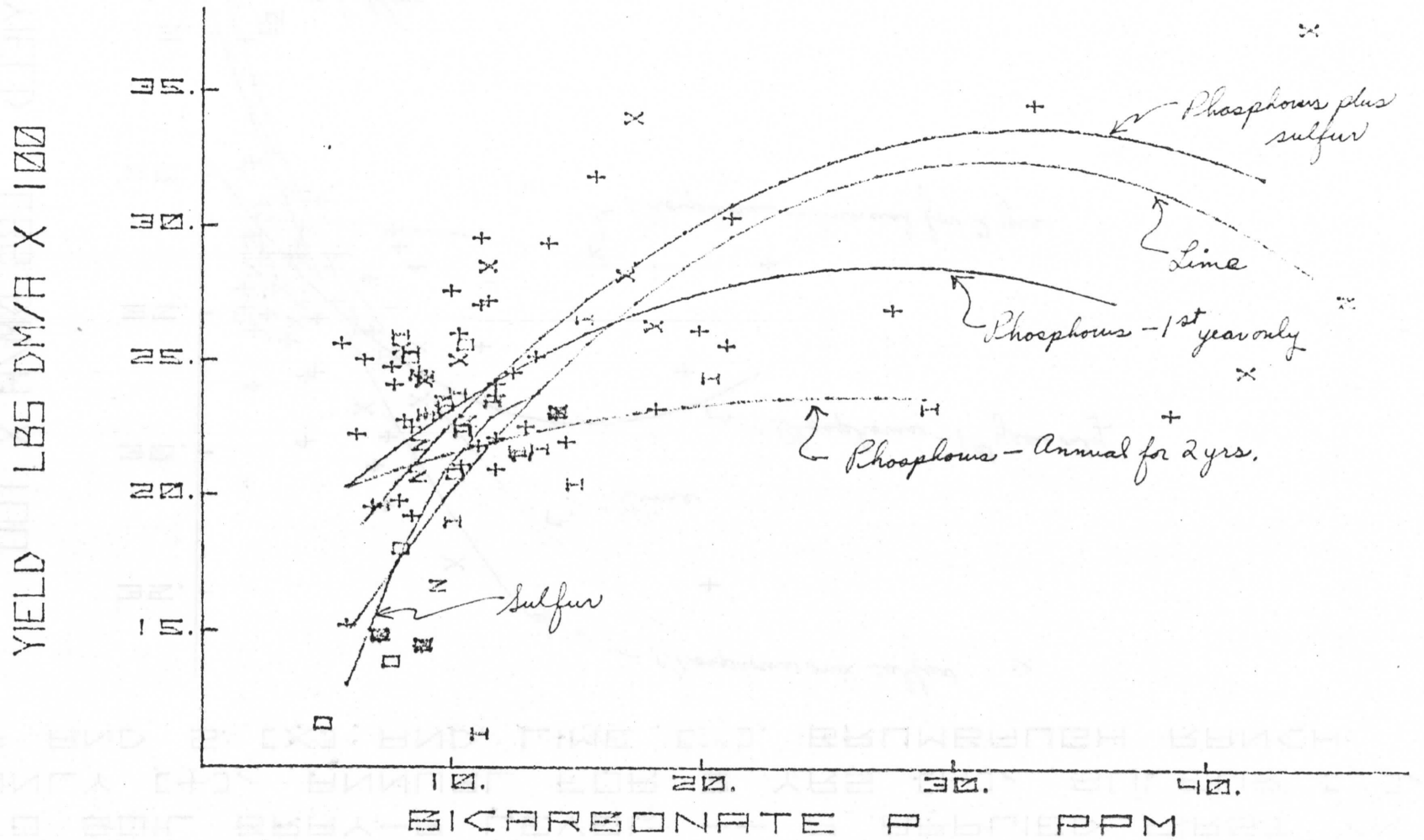


FORAGE YIELD RESPONSE IN 1976 TO PHOSPHORUS  
 AND SULFUR CO., PHOSPHORUS AND SULFUR CO.,  
 AND LIME CO. BRUMBAUGH RANCH - YUBA COUNTY

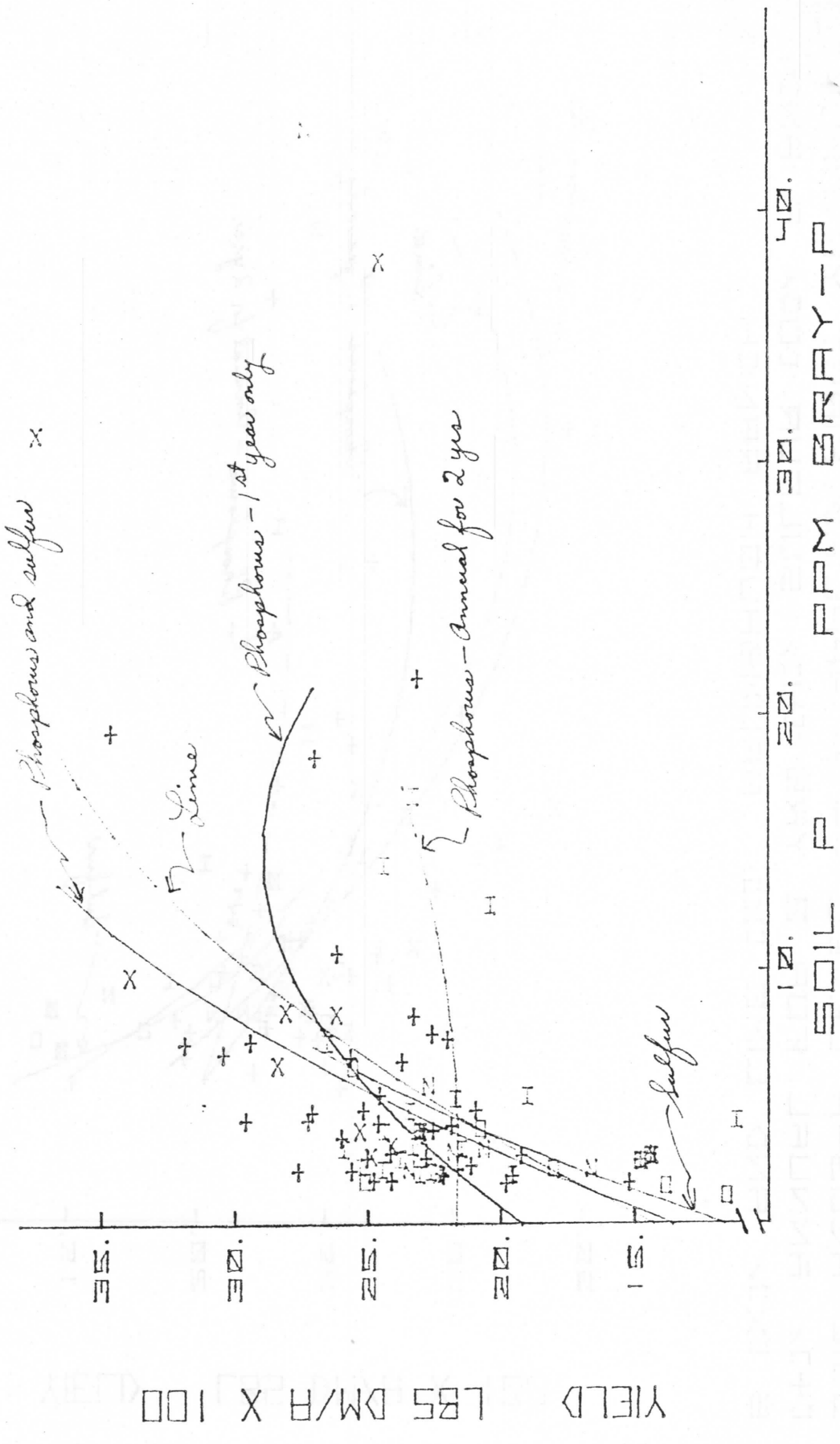


PHOSPHORUS APPLIED LBS/A

FORAGE YIELD RESPONSE IN 1979 AS RELATED TO  
 SOIL HCO<sub>3</sub>-P LEVEL -- P APPLIED FIRST YR ONLY  
 [+], ANNUAL FOR 2 YRS [H], SULFUR [O], P AND  
 S [X], AND LIME [Z]. BRUMBAUGH RANCH



FOR THE YIELD RESPONSE IN 1979 AS RELATED TO SOIL BRAY-P LEVEL -- P APPLIED FIRST YEAR ONLY CH3, ANNUAL FOR 2 YRS CH3, SULFUR CH3, AND S AND LIME CH3. BRUMBROUGH BRANCH.



YIELD LBS DM/A X 100

SOIL P PPM BRAY-P



*Jim Clawson*

PHOSPHORUS RATE AND FREQUENCY TRIAL

Yuba Co. - Robert Brumbaugh Ranch  
Charles B. Wilson, Farm Advisor  
Roland D. Meyer, Soils Specialist

Objective: To define forage yield and quality response to different phosphorus rate and frequency regimes for the purpose of making economic decisions regarding fertilizer application.

Experimental

Design:

Randomized complete block with three replications. Individual plot size = 10' x 15'. The following clover seed mixture was seeded at 25 lbs seed/A utilizing the PELINOC inoculation system with the PELGEL sticker.

<u>Clover</u>	<u>Percent by Weight</u>
Wooenellup-sub	20
Geraldton-sub	20
Diminup-sub	15
Daliak-sub	10
Howard-sub	10
Hykon-rose	15
Kondinin-rose	10

Evaluations: Forage

- 1) Dry matter yields - 4-one ft sq quadrats.
- 2) Total N, Total P, Total S on above samples.

Soils

- 1) Initial samples from control plots. 2" increments to 6" depth: SP, pHs, ECe, Ca + Mg, HCO<sub>3</sub>-P, Bray #1-P, K, SO<sub>4</sub>-S.
- 2) All plots in spring of 1979, 1981 and 1983: HCO<sub>3</sub>-P, Bray #1-P and SO<sub>4</sub>-S.



Treatments: Application rates indicated are  
 lbs.  $P_2O_5/A$  as treble superphosphate (0-45-0)

5                      10                      15

Treat- ment #	Fall 1977	Fall 1978	Fall 1979	Fall 1980	Fall 1981	Fall 1982	Total
1.	0						0
2.	30						30
3.	60						60
4.	120						120
5.	240						240
6.	5 (11 lbs/A)	5	5	5	5	5	30
7.	10	10	10	10	10	10	60
8.	20	20	20	20	20	20	120
9.	40	40	40	40	40	40	240
10.	10		10		10		30
11.	20		20		20		60
12.	40		40		40		120
13.	80		80		80		240
14.	15			15			30
15.	30			30			60
16.	60			60			120
17.	120			120			240
18.	15	5		5		5	30
19.	30	10		10		10	60
20.	45	5		5		5	60
21.	0+40*						0+40*
22.	0+80*						0+80*
23.	30+40*						30+40*
24.	60+40*						60+40*
25.	120+80*						120+80*
26.	1 ton lime						
27.	2 tons lime						

Cont  
 period  
 10-12  
 lbs/A

100 SSP/gm

200

\* lbs S/A as gypsum



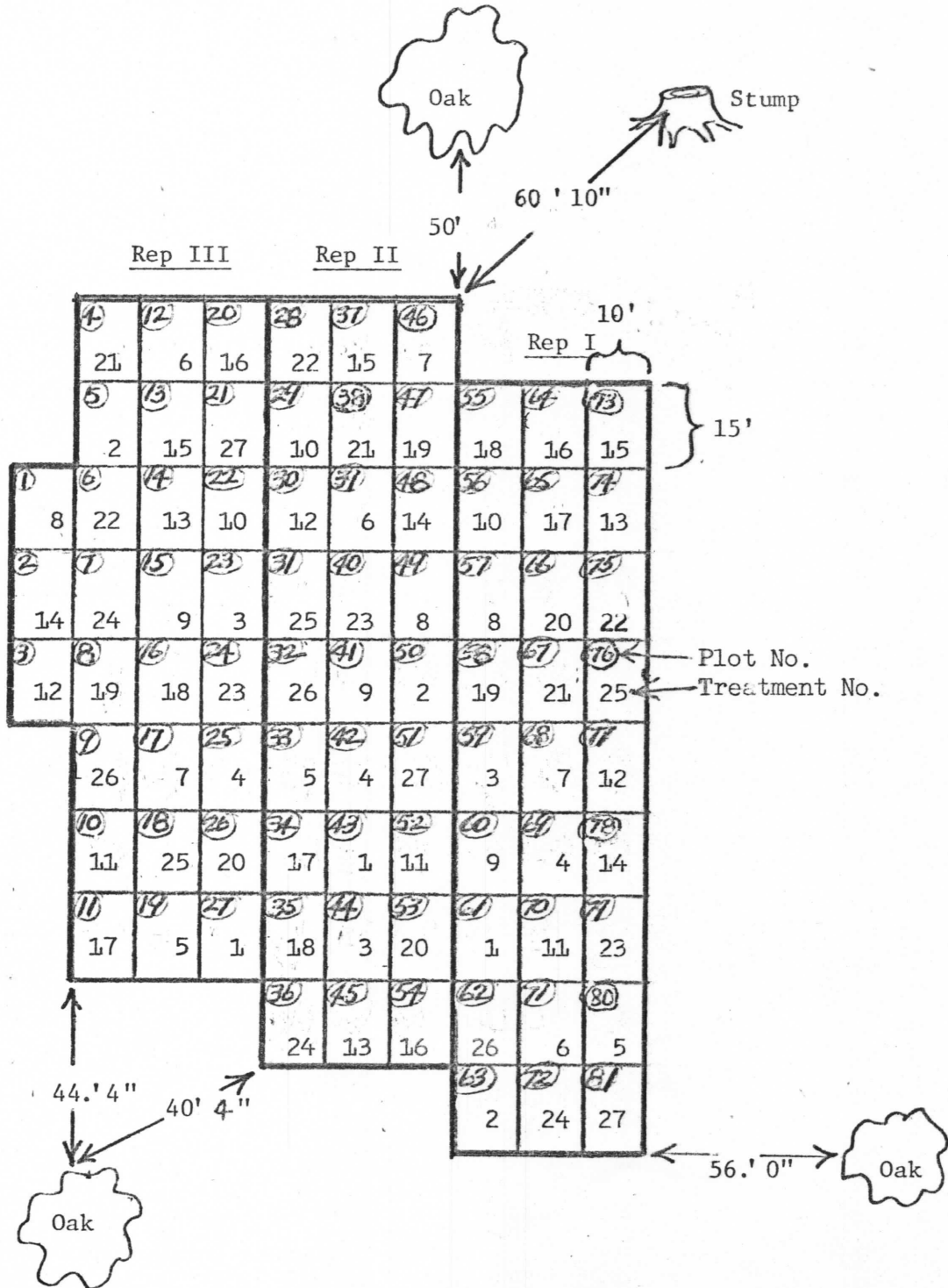
ROBERT BRUMBAUGH RANCH - Yuba County

Roland D. Meyer & Charles B. Wilson

Clover Seeded - 10-31-77

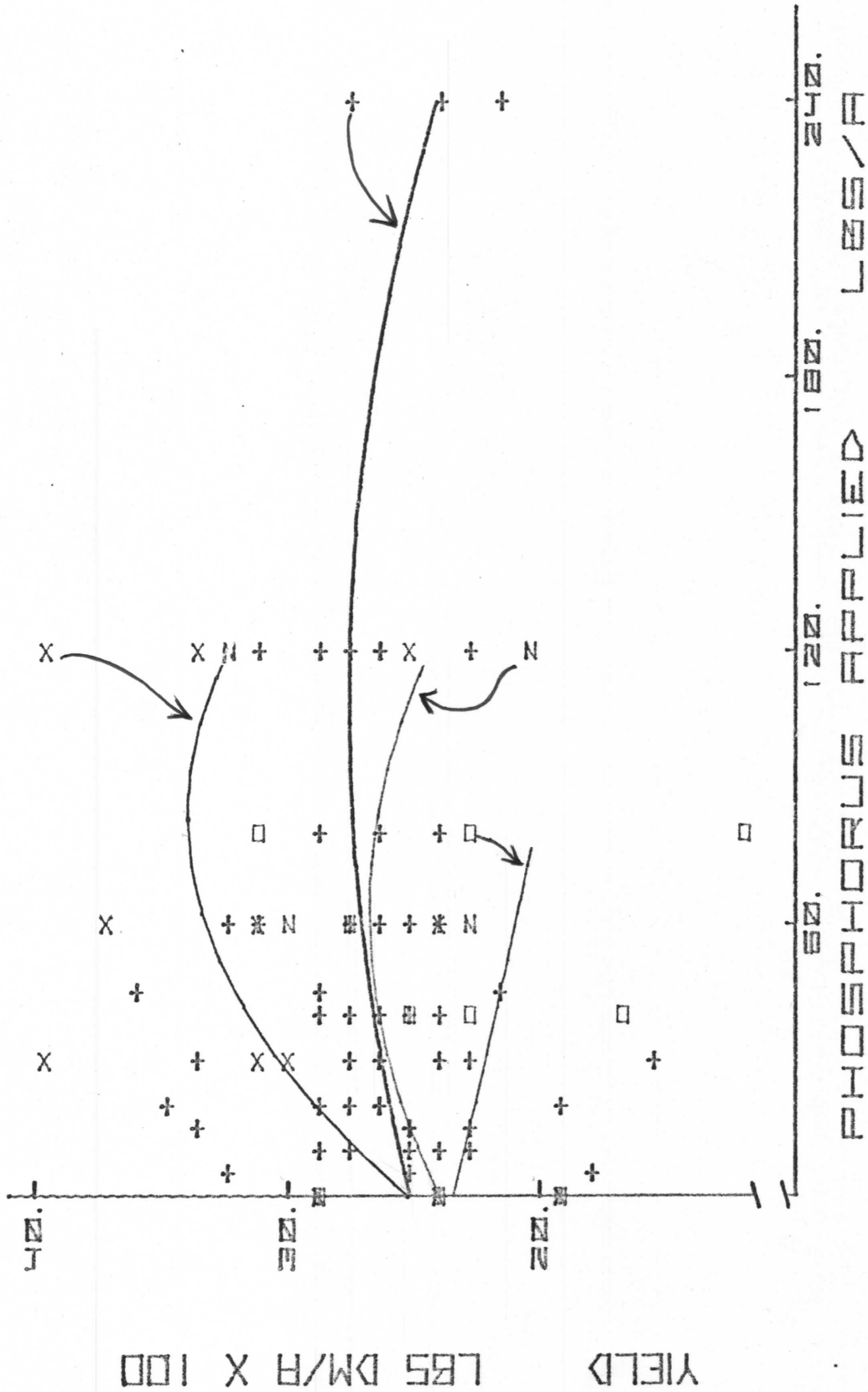
Initial Fertilization 1-25-78

Dirt Road





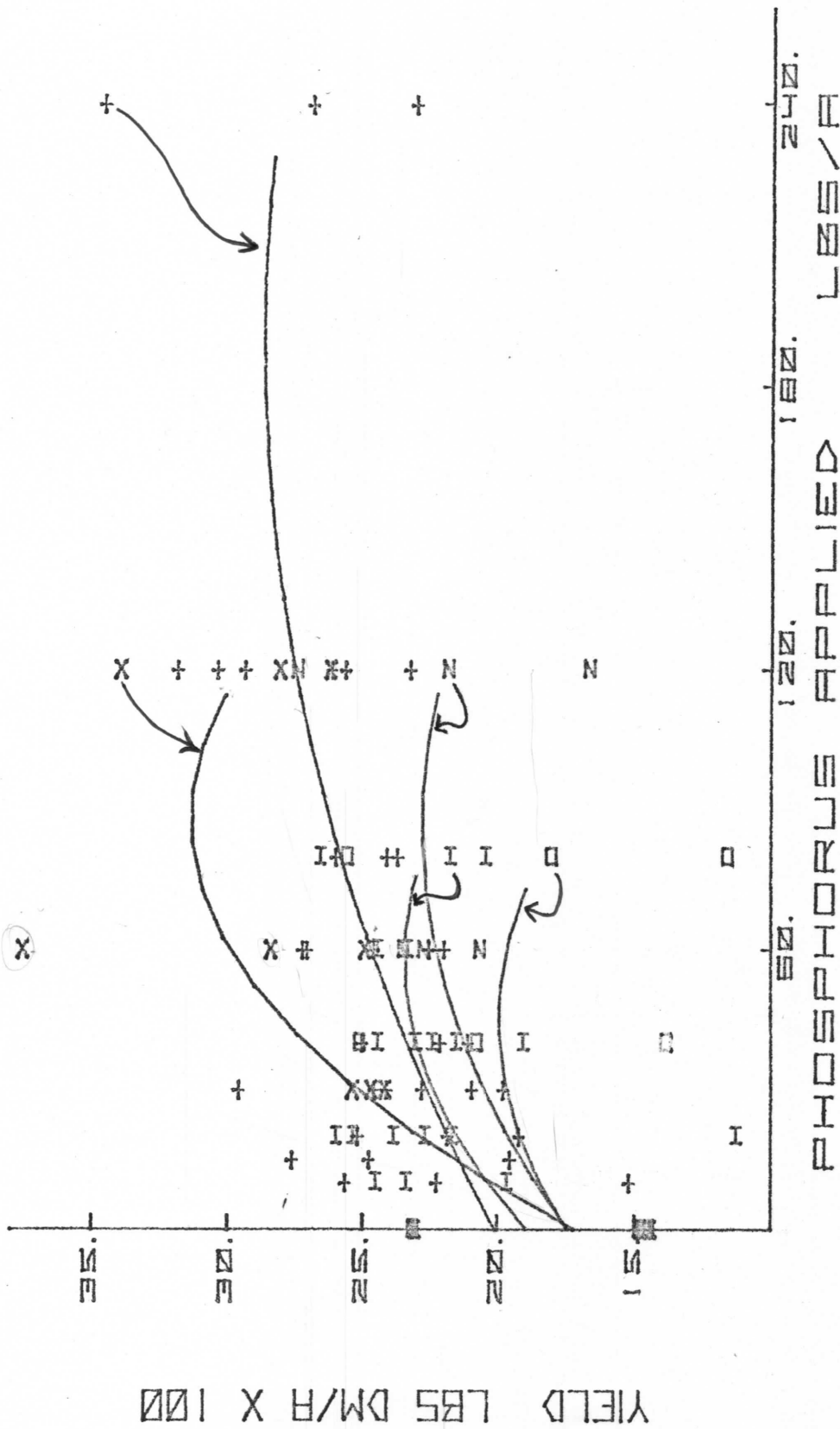
FORAGE YIELD RESPONSE IN 1978 TO PHOSPHORUS  
 AND SULFUR CO., PHOSPHORUS AND SULFUR CO.,  
 AND LIME CO., BRUMBAUGH RANCH-YUBA COUNTY







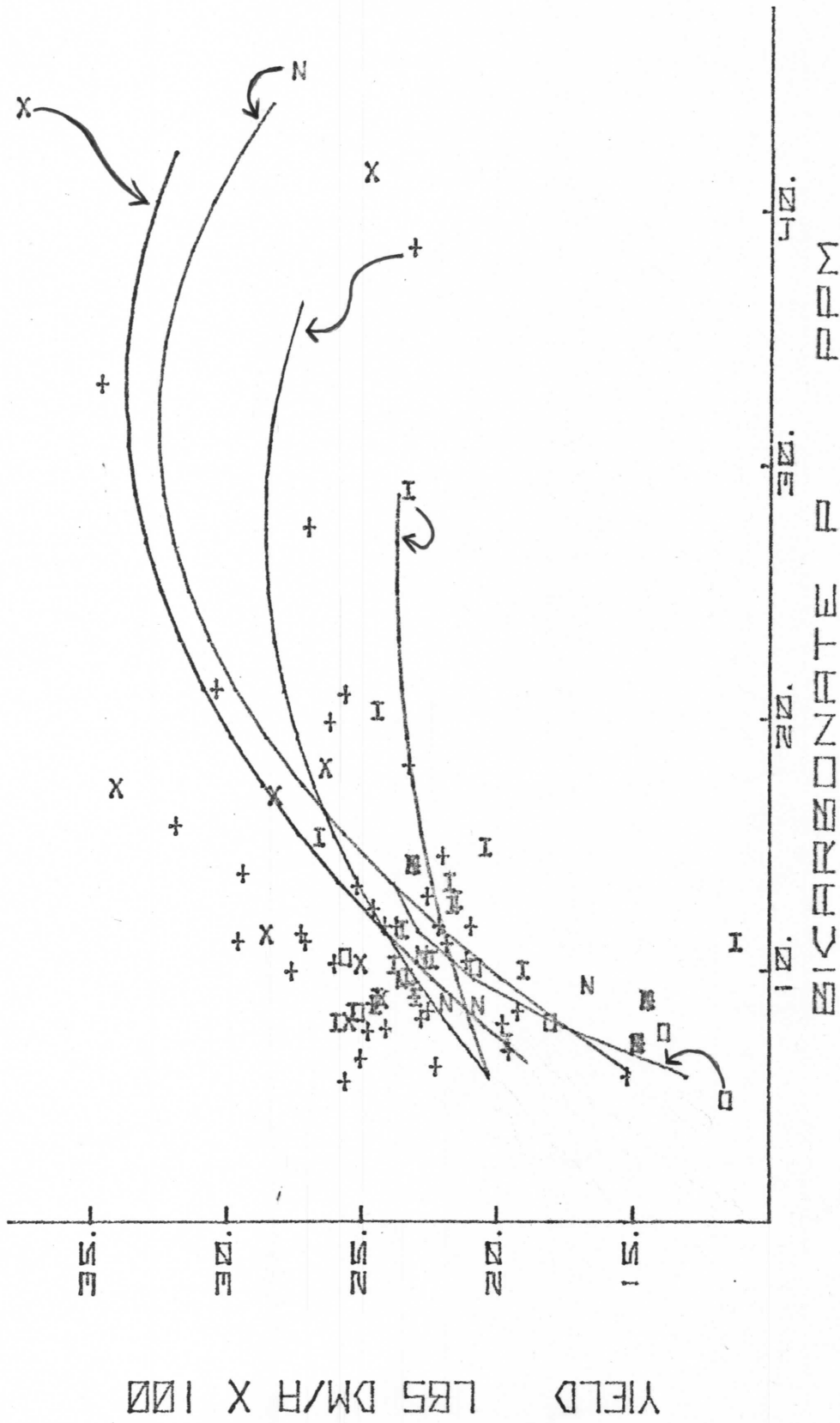
FORAGE YIELD RESPONSE IN 1978 TO APPLIED  
 PHOSPHORUS, FIRST YR ONLY (4), ANNUAL FOR  
 2 YRS (3), SULFUR (0), PHOSPHORUS AND  
 SULFUR (X), AND LIME (Z). BRUMBROUGH RANCH



0 20 40 60 80

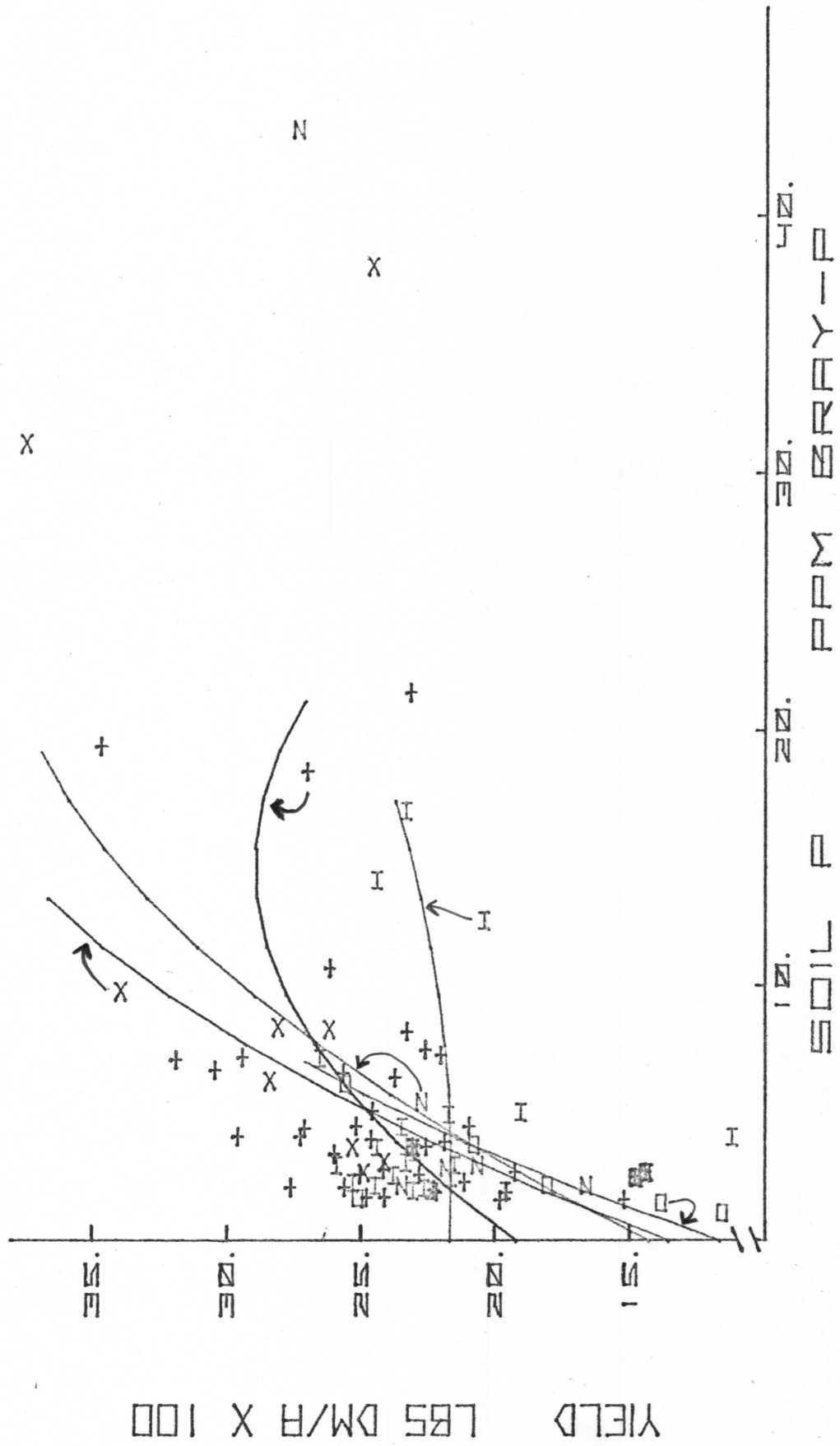


FORAGE YIELD RESPONSE IN 1979 AS RELATED TO SOIL MOISTURE LEVEL - P APPLIED FIRST YR ONLY  
 CHJ, ANNUAL FOR 2 YRS CHJ, SULFUR COJ, P AND S EXJ, AND LIME CJJ. BRUMBROUGH RANCH



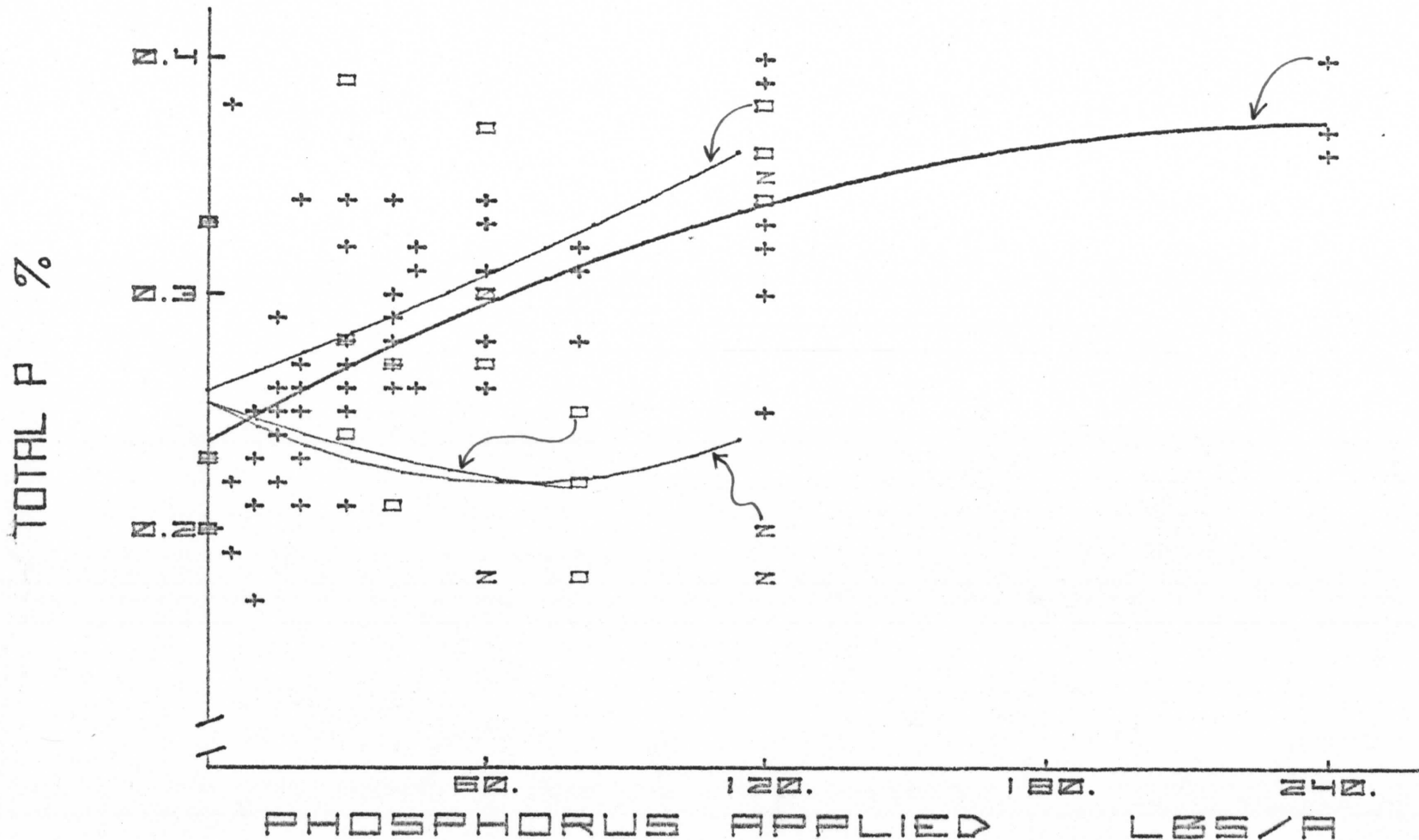


FORAGE YIELD RESPONSE IN 1979 AS RELATED TO SOIL BRAY-1-P LEVEL -- P APPLIED FIRST YR AND 2 YRS CH3, Sulfur Co., AND S EXCESS AND LIME CO2, BRUMBAUGH RANCH.





FORAGE TOTAL P IN 1978 AS INFLUENCED BY PHOSPHORUS [ + ], SULFUR [ O ], PHOSPHORUS AND SULFUR [ X ], AND LIME [ Z ]. BRUMBAUGH RANCH - YUBA COUNTY.







## PHOSPHORUS RATE AND FREQUENCY TRIAL

Tehama Co. - Larry Alvares Ranch  
Ronald S. Knight, Farm Advisor  
Roland D. Meyer, Soils Specialist

Objective: To define forage yield and quality response to different phosphorus rate and frequency regimes for the purpose of making economic decisions regarding fertilizer application.

### Experimental Design:

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- 2) All plots in spring of 1979, 1981 and 1983:  $\text{HCO}_3\text{-P}$ , Bray #1-P and  $\text{SO}_4\text{-S}$ .



Treatments: Application rates indicated are  
lbs. P<sub>2</sub>O<sub>5</sub>/A as treble superphosphate (0-45-0)

Treat- ment #	Fall 1977	Fall 1978	Fall 1979	Fall 1980	Fall 1981	Fall 1982	Total
1.	0						0
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3.	60						60
4.	120						120
5.	240						240
6.	5	5	5	5	5	5	30
7.	10	10	10	10	10	10	60
8.	20	20	20	20	20	20	120
9.	40	40	40	40	40	40	240
10.	10		10		10		30
11.	20		20		20		60
12.	40		40		40		120
13.	80		80		80		240
14.	15			15			30
15.	30			30			60
16.	60			60			120
17.	120			120			240
18.	15	5		5		5	30
19.	30	10		10		10	60
20.	45	5		5		5	60
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22.	0+80*						0+80*
23.	30+40*						30+40*
24.	60+40*						60+40*
25.	120+80*						120+80*
26.	1 ton lime						
27.	2 tons lime						
* lbs S/A as gypsum							



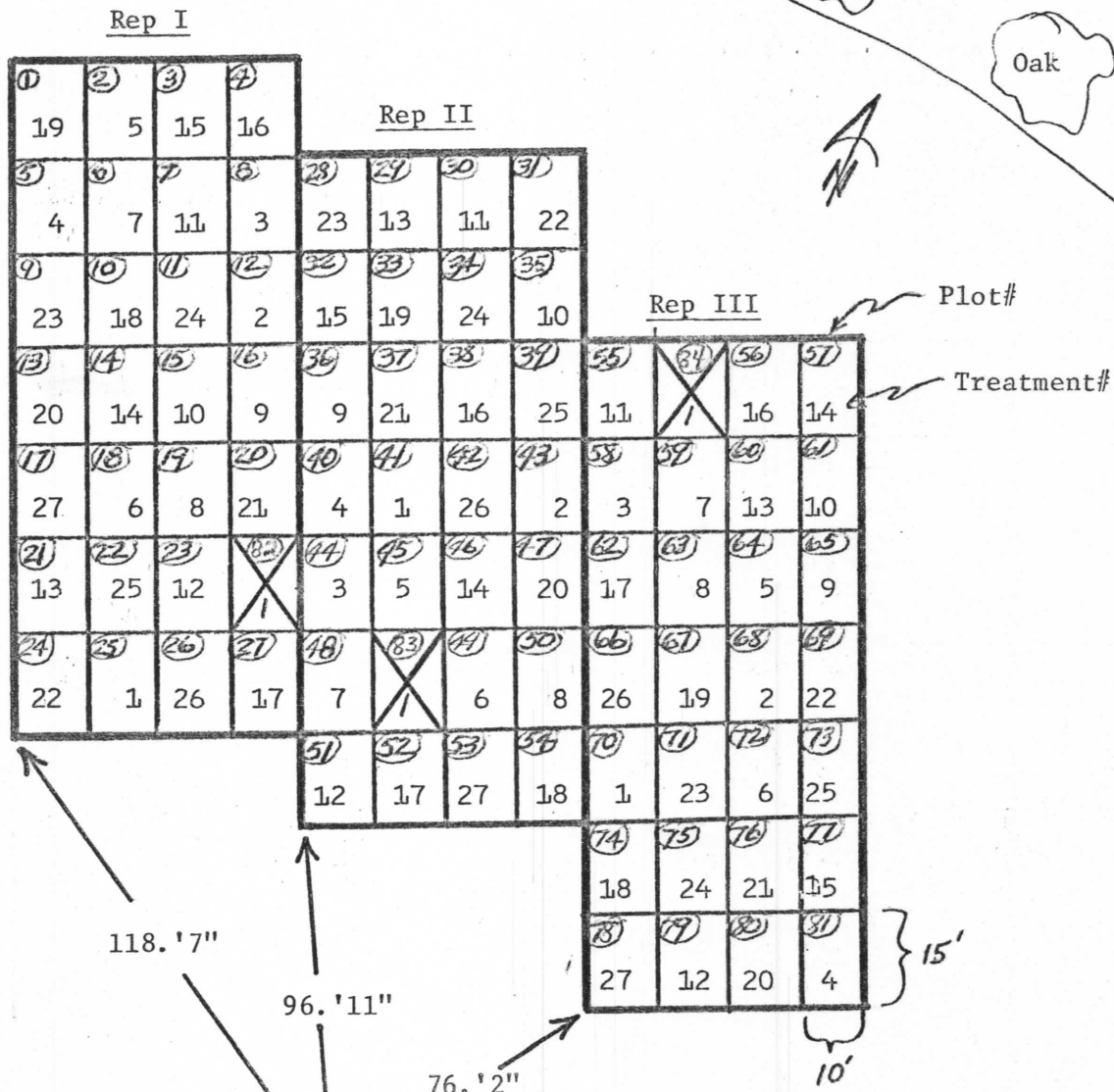
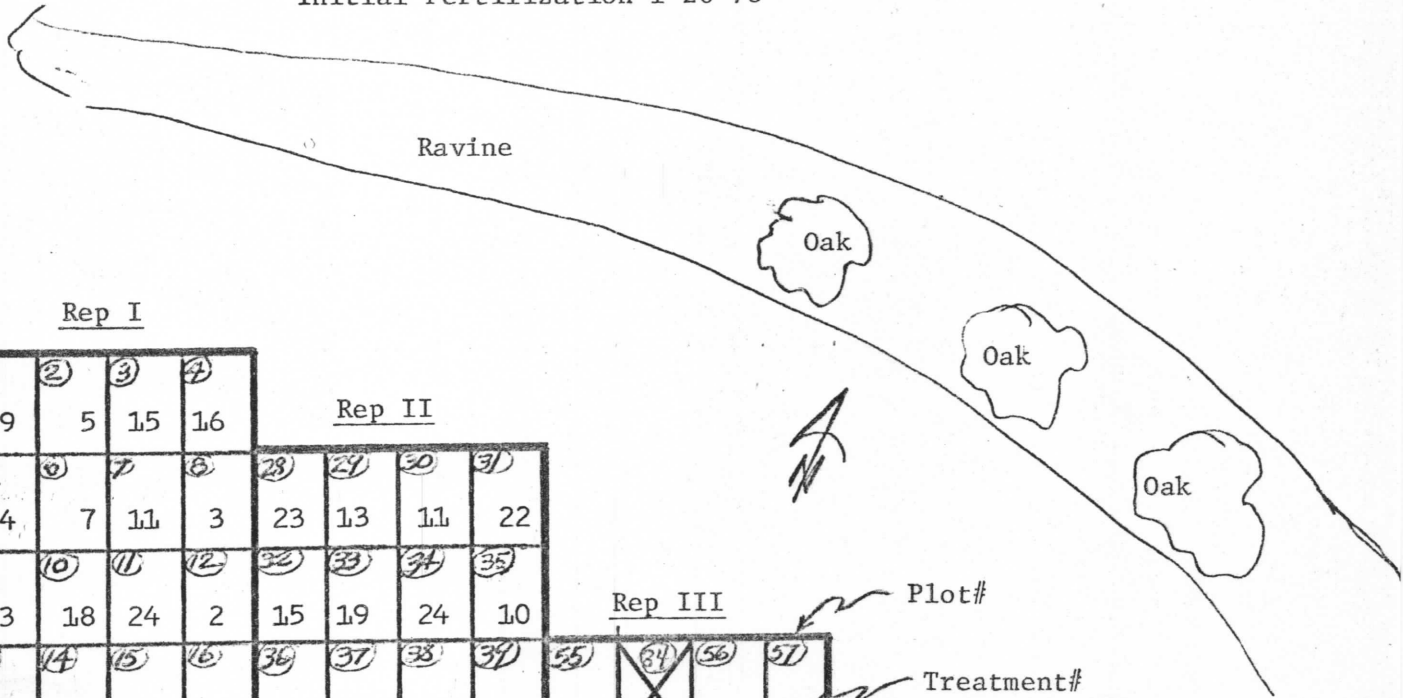
LARRY ALVARES RANCH - Tehama County

Roland D. Meyer & Ronald S. Knight

Clover Seeded - 10-28--7

Initial Fertilization 1-26-78

*totally new*



Measurement on oak approximately 2' up from ground level.

1. Initial seedling count on 1-25-50  
 2. Flower counts - 10-25-51  
 3. Harvest on 10-25-51  
 4. Final seedling count on 1-25-52



Plot  
 Treatment

Plot 112

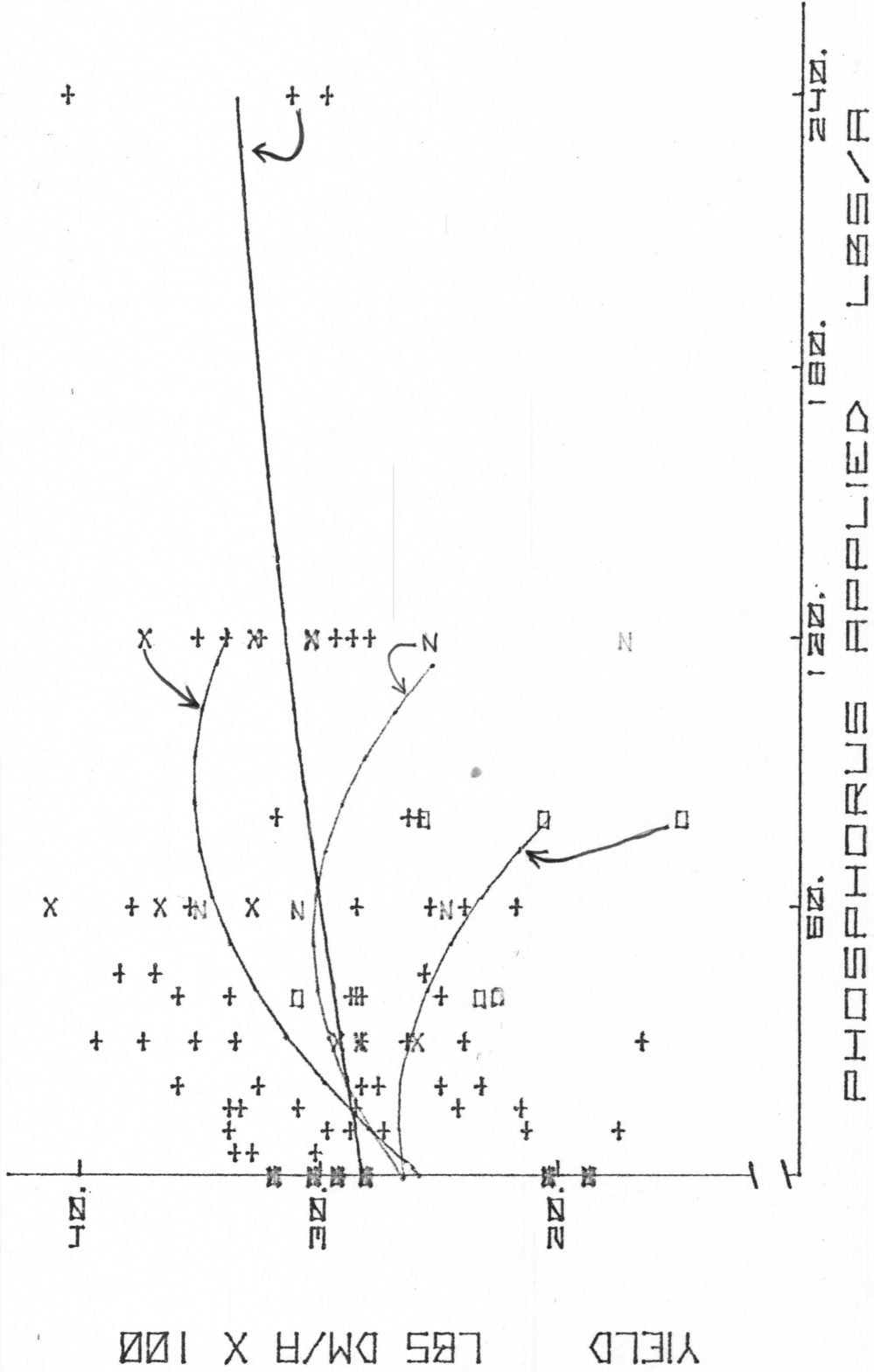
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Plot 113

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Harvested on 10-25-51  
 (see first level)

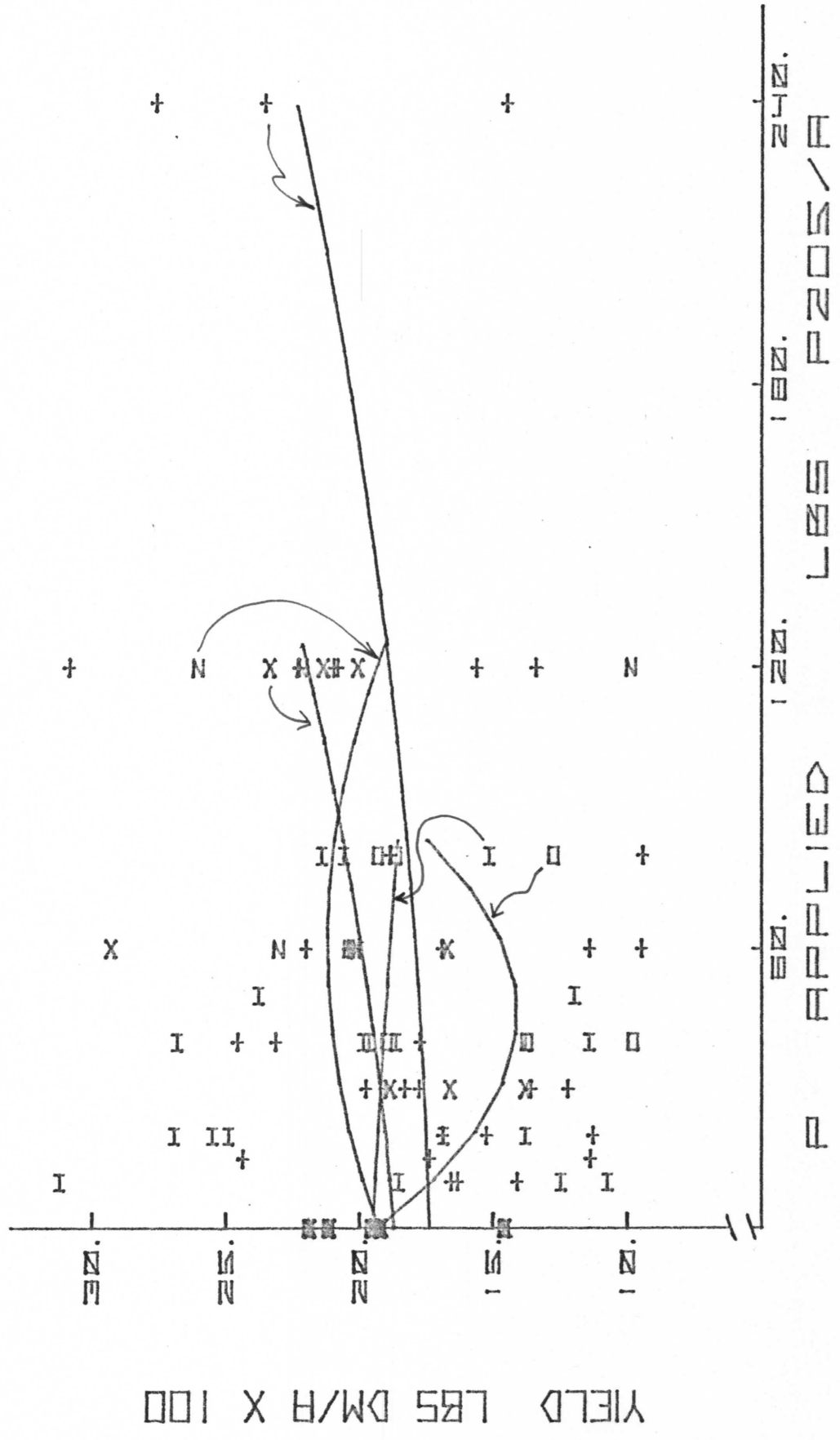
FORAGE YIELD RESPONSE IN 1978 TO PHOSPHORUS  
 (+) SULFUR (+), PHOSPHORUS AND SULFUR (+) AND  
 AND LIME (+). ALVARES RANCH-TEHAMA COUNTY.







FORGIVE YIELD RESPONSE IN 1978 TO APPLIED PHOSPHORUS, FIRST YR ONLY (+), ANNUAL FOR 2 YRS (X), SULFUR CO<sub>2</sub>, PHOSPHORUS AND SULFUR EX<sub>2</sub> AND LIME (Z). ALVARRES RANCH.



YIELD LBS DM/A X 100

LBS P<sub>2</sub>O<sub>5</sub>/A



## PHOSPHORUS RATE AND FREQUENCY BY LIME TRIAL

Shasta Co., Glenn Hawes Ranch  
Walter H. Johnson, Farm Advisor  
Roland D. Meyer, Extension Soils Specialist

Objective: To define forage yield and quality response to different phosphorus rate and frequency regimes as effected by lime for the purpose of making economic decisions regarding fertilizer and lime application.

### Experimental Design and Application

of Treatments: Randomized complete block with three replications. Individual plot size = 10' x 15'. Lime was broadcast and incorporated with Kubota tractor and 4 foot wide rototiller to depth of 2-3". Surface broadcast lime, phosphorus, gypsum and seed were applied prior to rolling so as to provide a firm seedbed. The following clover seed mixture was seeded at 25 lbs seed/A utilizing the PELINOC inoculation system with the PELGEL sticker.

<u>Clover</u>	<u>Percent by Weight</u>
Woogenellup-sub	20
Geraldton-sub	20
Dinninup-sub	15
Daliak-sub	10
Howard-sub	10
Hykon-rose	15
Kondinin-rose	10

### Evaluations: Forage

- 1) Dry matter yields - cut with lawn mower (19 to 20" wide by ~ 13.5' by 1 1/2" high).
- 2) Total N, Total P, Total S on above samples.

### Soils

- 1) Initial samples from control plots. 2" increments to 6" depth: SP, pHs, ECe, Ca + Mg, HCO<sub>3</sub>-P, Bray #1-P, K, SO<sub>4</sub>-S.
- 2) All plots in spring of 1980, 1982 and 1984: HCO<sub>3</sub>-P, Bray #1-P and SO<sub>4</sub>-S.



Treatments: Application rates indicated are  
 lbs.  $P_2O_5/A$  as treble superphosphate (0-45-0)

Treatment #	Fall 1978		Fall 1979	Fall 1980	Fall 1981	Fall 1982	Fall 1983	Total
	lbs. $P_2O_5/A$	Lime Trt.						
1.	0	1						0
2.	30	2						30
3.	60	2						60
4.	120	2						120
5.	240	2						240
6.	5	2	5	5	5	5	5	30
7.	10	2	10	10	10	10	10	60
8.	20	2	20	20	20	20	20	120
9.	40	2	40	40	40	40	40	240
10.	10	2		10		10		30
11.	20	2		20		20		60
12.	40	2		40		40		120
13.	80	2		80		80		240
14.	15	2			15			30
15.	30	2			30			60
16.	60	2			60			120
17.	120	2			120			240
18.	20	2	0	5	0	5	0	30
19.	40	2	0	10	0	10	0	60
20.	80	2	0	20	0	20	0	120
21.	160	2	0	40	0	40	0	240
22.	30	2	6	6	6	6	6	60
23.	60	2	6	6	6	6	6	90
24.	60	2	12	12	12	12	12	120
25.	60	2	24	24	24	24	24	180
26.	120	2	24	24	24	24	24	240
27.	60	2	0	15	0	15	0	90
28.	60	2	0	30	0	30	0	120
29.	60	2	0	60	0	60	0	180
30.	0	2						0
31.	10+10*	2	10+10	10+10	10+10	10+10	10+10	60+60
32.	20+20*	2	20+20	20+20	20+20	20+20	20+20	120+120
33.	40+40*	2	40+40	40+40	40+40	40+40	40+40	240+240
34.	5	1	5	5	5	5	5	30
35.	10	1	10	10	10	10	10	60
36.	20	1	20	20	20	20	20	120
37.	40	1	40	40	40	40	40	240
38.	20+20*	1	20+20	20+20	20+20	20+20	20+20	120+120
39.	40+40*	1	40+40	40+40	40+40	40+40	40+40	240+240
40.	0	3						0
41.	5	3	5	5	5	5	5	30
42.	10	3	10	10	10	10	10	60
43.	20	3	20	20	20	20	20	120
44.	40	3	40	40	40	40	40	240
45.	20+20*	3	20+20	20+20	20+20	20+20	20+20	120+120
46.	40+40*	3	40+40	40+40	40+40	40+40	40+40	240+240
47.	0	1						0
48.	0	1						0

\* lbs S/A as gypsum

1/ Lime Treatments: 1= none  
 2= 2 tons/A incorporated 2" deep  
 3= 2 tons/A broadcast on soil surface



PHOSPHORUS RATE AND FREQUENCY BY LIME TRIAL

Shasta Co.-Glenn Hawes Ranch  
 Walter Johnson, Farm Advisor  
 Roland D. Meyer, Soils Specialist

①	②	③	④	⑤	⑥	⑦	⑧	④⑨	⑤⑩	⑤⑪	⑤⑫	⑤⑬	⑤⑭	⑤⑮	⑤⑯	⑦⑰	⑦⑱	⑦⑲	⑩⑳	⑩㉑	⑩㉒	⑩㉓	⑩㉔
43	48	16	33	37	29	6	27	30	38	48	19	26	33	34	40	15	5	41	28	17	40	34	6
⑬⑱	⑬⑲	⑬㉑	⑬㉒	⑬㉓	⑬㉔	⑬㉕	⑬㉖	⑬㉗	⑬㉘	⑬㉙	⑬㉚	⑬㉛	⑬㉜	⑬㉝	⑬㉞	⑬㉟	⑬㊱	⑬㊲	⑬㊳	⑬㊴	⑬㊵	⑬㊶	⑬㊷
23	46	36	8	25	35	10	31	12	16	31	25	10	20	44	22	45	8	20	42	46	16	24	47
⑬㊸	⑬㊹	⑬㊺	⑬㊻	⑬㊼	⑬㊽	⑬㊾	⑬㊿	⑬㏀	⑬㏁	⑬㏂	⑬㏃	⑬㏄	⑬㏅	⑬㏆	⑬㏇	⑬㏈	⑬㏉	⑬㏊	⑬㏋	⑬㏌	⑬㏍	⑬㏎	⑬㏏
32	38	42	24	4	13	45	47	27	6	15	9	3	17	2	47	31	44	7	22	37	9	3	12
⑬㏐	⑬㏑	⑬㏒	⑬㏓	⑬㏔	⑬㏕	⑬㏖	⑬㏗	⑬㏘	⑬㏙	⑬㏚	⑬㏛	⑬㏜	⑬㏝	⑬㏞	⑬㏟	⑬㏠	⑬㏡	⑬㏢	⑬㏣	⑬㏤	⑬㏥	⑬㏦	⑬㏧
28	39	21	5	40	15	20	3	46	14	21	11	28	7	24	23	30	19	32	23	48	26	14	25
⑬㏨	⑬㏩	⑬㏪	⑬㏫	⑬㏬	⑬㏭	⑬㏮	⑬㏯	⑬㏰	⑬㏱	⑬㏲	⑬㏳	⑬㏴	⑬㏵	⑬㏶	⑬㏷	⑬㏸	⑬㏹	⑬㏺	⑬㏻	⑬㏼	⑬㏽	⑬㏾	⑬㏿
9	44	26	22	12	7	2	30	13	45	1	8	32	18	39	35	18	11	10	29	39	2	35	36
⑬㏿	⑬㐀	⑬㐁	⑬㐂	⑬㐃	⑬㐄	⑬㐅	⑬㐆	⑬㐇	⑬㐈	⑬㐉	⑬㐊	⑬㐋	⑬㐌	⑬㐍	⑬㐎	⑬㐏	⑬㐐	⑬㐑	⑬㐒	⑬㐓	⑬㐔	⑬㐕	⑬㐖
41	19	11	18	17	34	14	1	43	42	41	37	36	4	29	5	38	4	27	33	13	1	43	21

REP I

REP II

REP III

10'

15'

Old Phosphorus and Sulfur  
 Rate and Frequency Trial  
 (Sugar beet residue lime and 0-20-0)

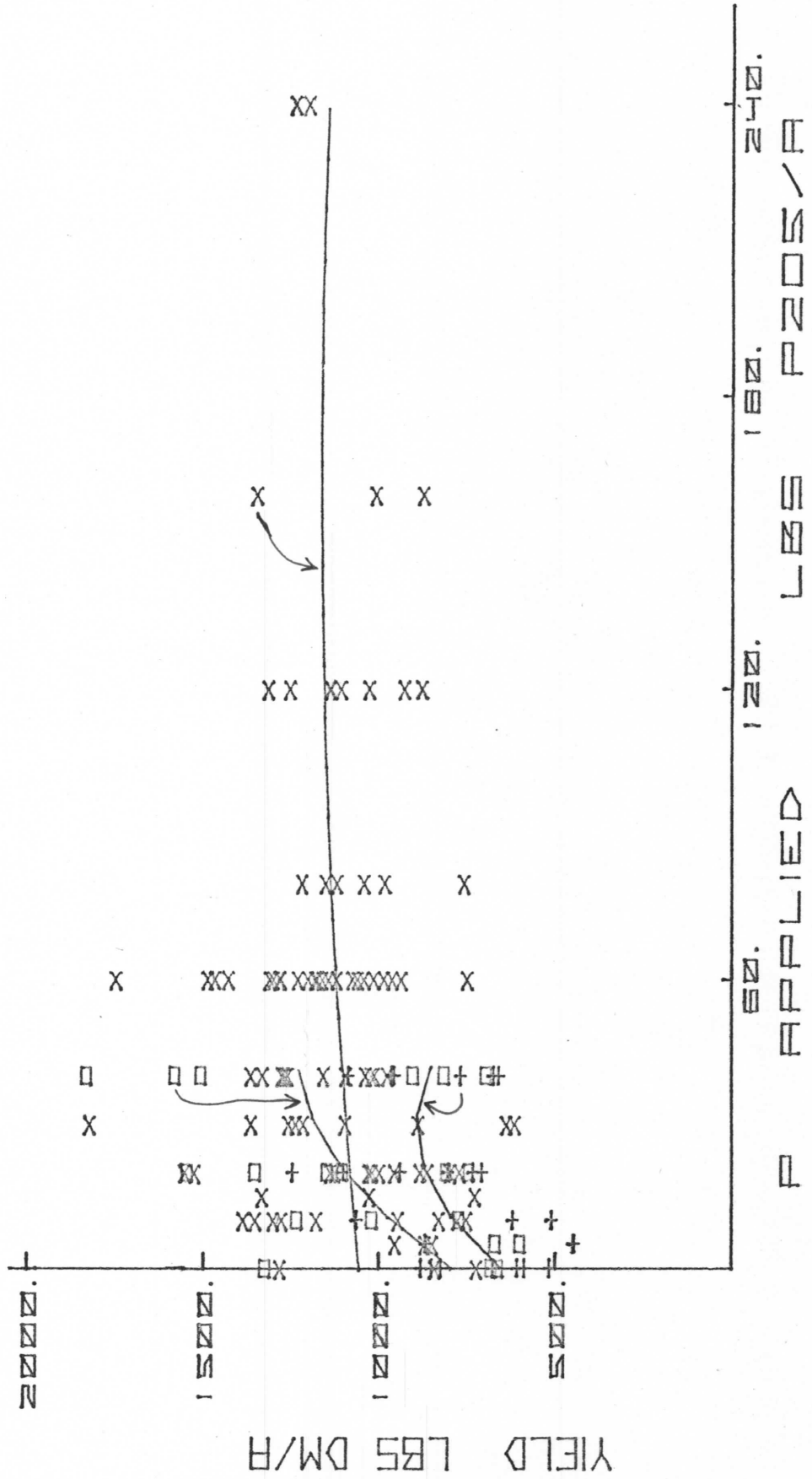
Fence along south boundary  
 of Sec 25, T31N, R4W

Field Road





FORAGE YIELD RESPONSE IN 1978 TO APPLIED  
 PHOSPHORUS AS INFLUENCED BY NO LIME C+3,  
 LIME ON SOIL SURFACE C03 OR LIME INCORPORATED  
 TWO INCHES DEEP CXS. HAWES RANCH.





FORBREW YIELD RESPONSE IN 1978 TO APPLIED  
 PHOSPHORUS AS INFLUENCED BY NO LIME C+J,  
 LIME ON SOIL SURFACE COJ OR LIME INCORPORATED  
 TWO INCHES DEEP CXJ. HAWES RANCH.

