INFLUENCE OF VARIETY, FERTILIZERS AND DATE OF HARVEST ON QUALITY OF POTATOES MANUFACTURED INTO CHIPS

by

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PROGRESS REPORT NO. 5

ON

STORAGE AND CHIPPING PHASES

by

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PROGRESS REPORT HATCH 122 POTATO PROCESSING PHASES

Variety - Cobbler[1]

A - Harvest Schedule for 1960 was Harvest I, July 8; Harvest II, July 22; Harvest III, August 2; Harvest IV, August 16; Harvest V, September 1; and Harvest VI, September 15, Harvest Schedule for 1961 was: I-July 24, II-August 8, III Aug. 21, IV-Sept 5, & V-Sept 18.

B - Storage Treatments -

Check - Fry directly after digging

Lot 1 - (70-1) Hold two weeks after digging and fry

Lot 2 - (70-2) Hold two weeks after digging, store @ 45° for 4 months, then move to 55° and hold two weeks. Move to 70°F and fry @ 1, 10 and 20 day intervals.

Lot 3 - (70-3) Hold two weeks after digging, move to 55° and hold for 3 months then move to 70°F and fry @ 1, 10 and 20 days.

Lot 4 - (55-1) Within one week after digging store @ 55° for 2 months, then remove to 70°F and fry @ 1, 10 and 20 day intervals.

Lot 5 - (55-2) Within one week after digging store @ 55° for 3 months, then remove to 70°F and fry @ 1, 10 and 20 day intervals.

Lot 6 - (55-3) Within one week after digging store @ 55° for 4 months, then remove to 70°F and fry @ 1, 10 and 20 day intervals.

Lot 7 - (45-1) Within one week after digging store @ 45° for 4 months, then remove to 70°F. and fry @ 1, 10 and 20 day intervals.

Lot 8 - (45-2) Within one week after digging store @ 45° for 4 months, then remove to 55°F and hold 2 weeks and remove to 70° and fry @ 1, 10 and 20 day intervals.

Lot 9 - (45-3) Within one week after digging store @ 45° for 4 months, then remove to 55° and hold 4 weeks and remove to 70°F and fry @ 1, 10 and 20 day intervals.

C - Chipping Methods -

1. Weigh out 2 lb. sample.
2. Peel in abrasive peeler for 30 seconds with water running during peeling operation.
3. Weigh peeled sample and calculate peel loss.
4. Slice in Littrell slicer (approximately 18 slices per inch).
5. Remove slices from water, drain for 1 minute and count number of slices per 1 lb.
6. Place slices on fryer belt and fry slices in peanut oil (feed end 360°F and discharge end 350°F).
7. Determine weight of fried sample and calculate % yield.
8. Place sample in bag, code, seal and store for analysis.

D - Quality Evaluation and Analysis -

1. Specific gravity - Use NPCI hydrometer method and record to nearest thousand (See Table I).
2. Count - Determine number of tubers per 8 lb. of potatoes by actual count - Use specific gravity sample.
3. Dark Chips - Subjectively evaluate all slices for dark chips or chips with dark rings, bruises, dark stem ends, Hollow Heart, etc. Count number of total slices and those dark and determine % dark chips. Use MacBeth Executive Light for uniform lighting.
4. Color of slices - Coughlin Scale - match chips to Coughlin color chart. Use MacBeth Executive Light and white tray. Score on scale 1 tc 10 (1 equals white and 10 very dark, 7 or less is acceptable).
5. Color of ground chips - Grind chips in Waring Blender
   a. Agtron - Standardize Agtron to 30 (gray disc) and read color of ground chips on Agtron scale. See Chart I for relationship of Agtron to Coughlin.
   b. Hunter - Standardize Hunter (L-73.4, a-1.0, b-31.7) and read color of ground chips on Hunter L, a and b dials.
6. Reducing Sugar - Determine reducing sugar using Peacock and Bruinstetter method.

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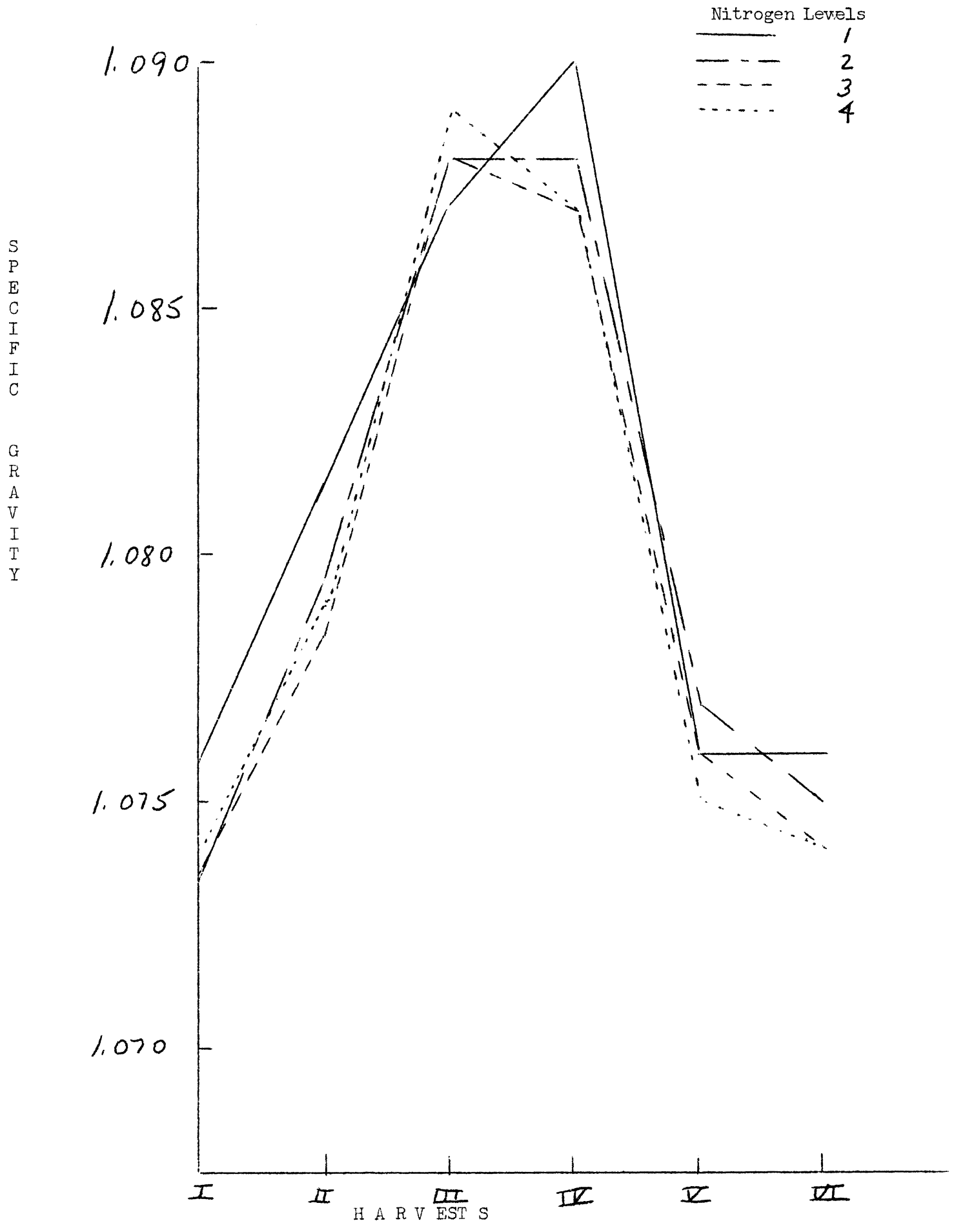
CHART II RELATIONSHIP OF SPECIFIC GRAVITY TO HARVEST DATES AND NITROGEN LELVELS.



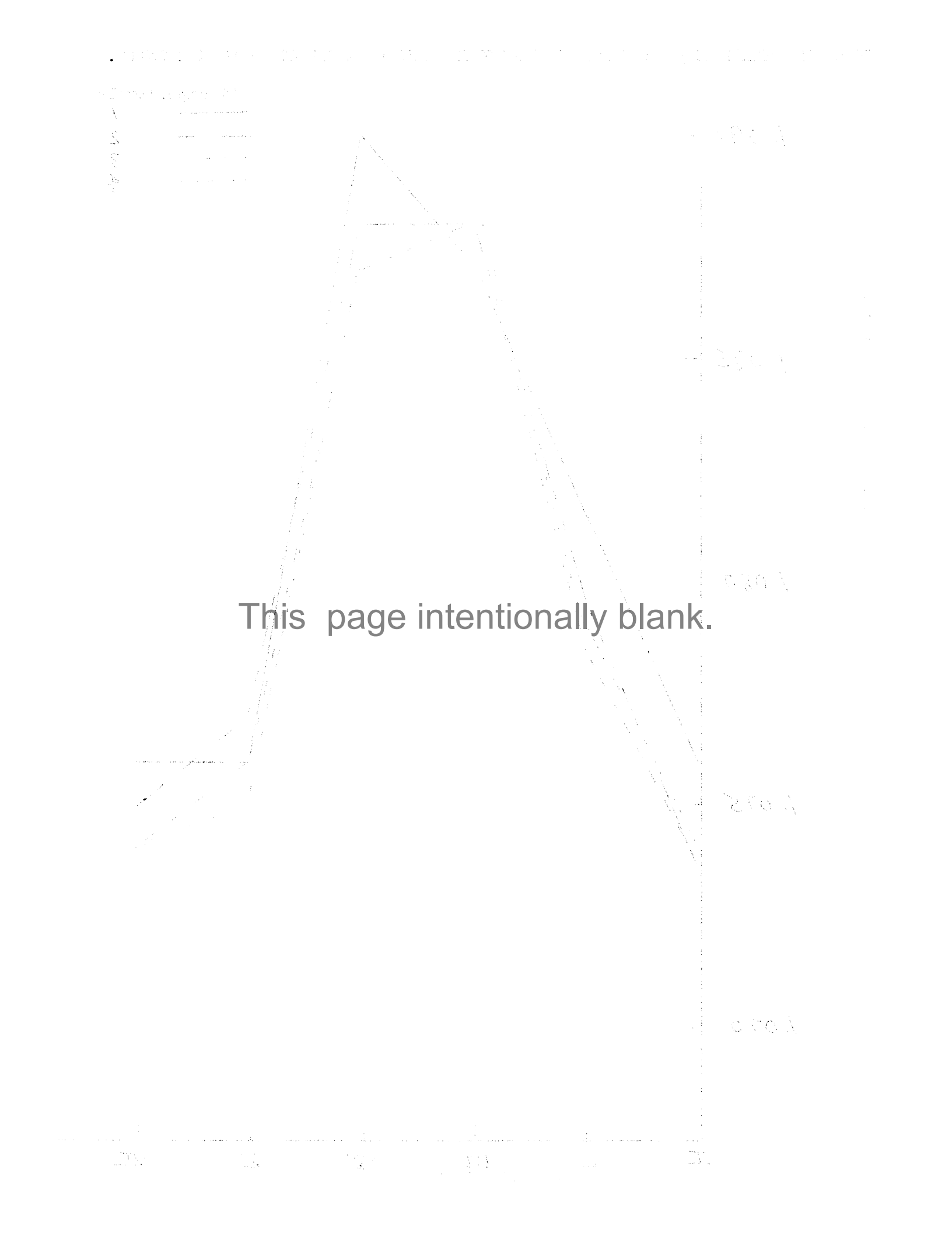

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CHART IIA RELATIONSHIP OF SPECIFIC GRAVITY TO HARVEST DATES AND NITROGEN LEVEL
Cobbler Variety-1961

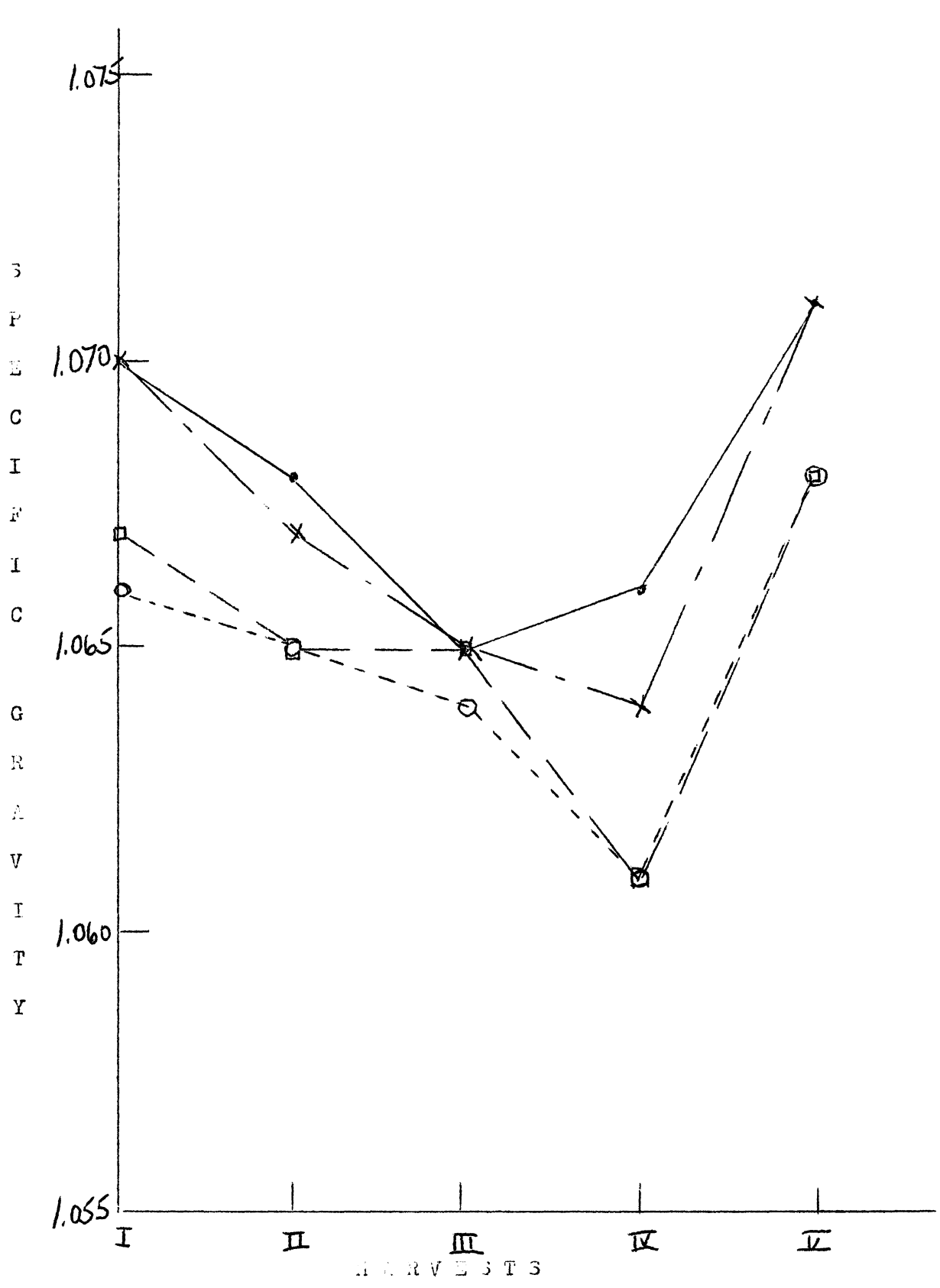

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CHART IIB RELATIONSHIP OF SPECIFIC GRAVITY TO HARVEST DATES AND NITROGEN LEVELES
Kennebec Variety - 1961

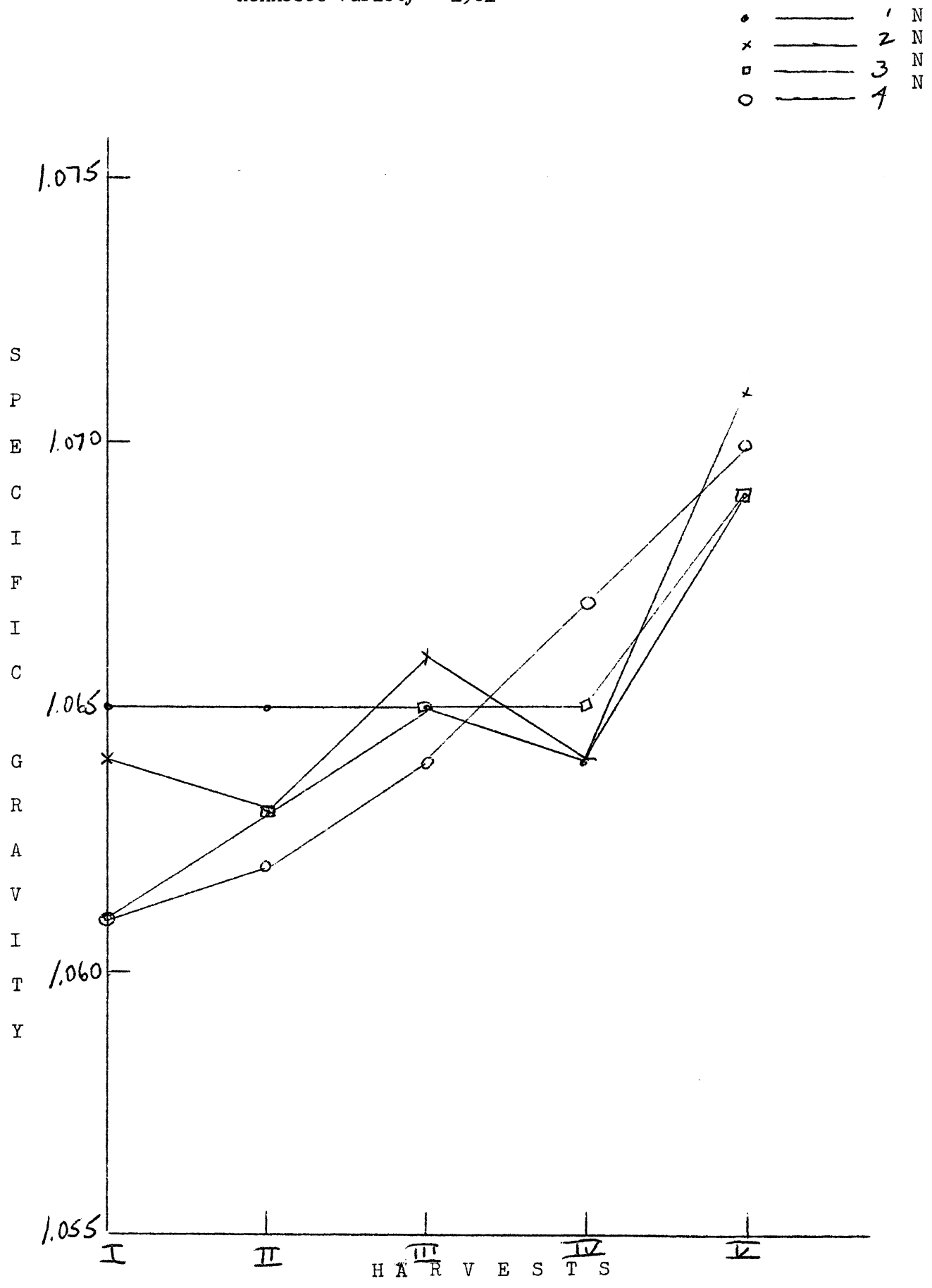

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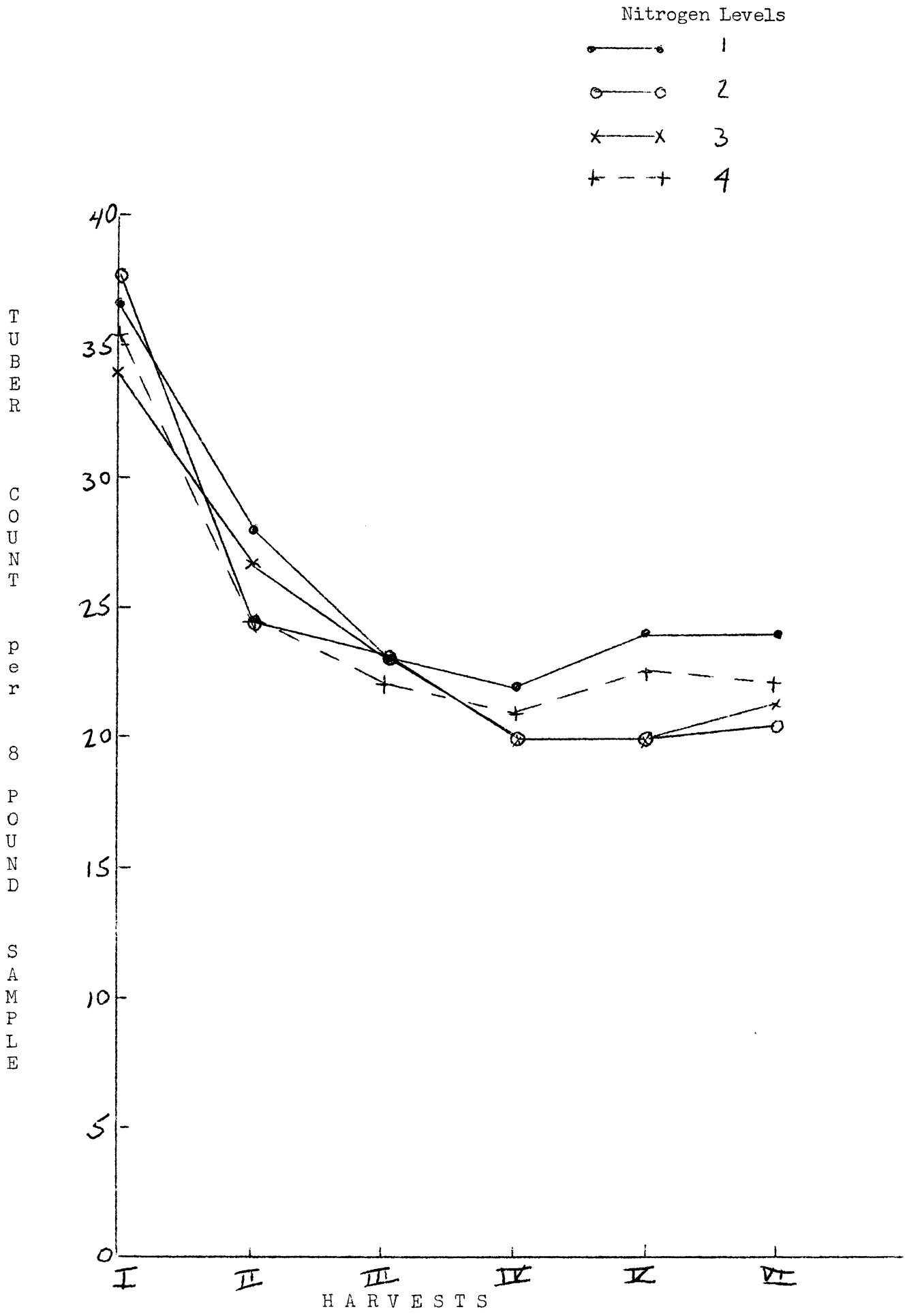
CHART III RELATIONSHIP OF TUBER COUNT PER 8 POUND SAMPLE TO HARVEST DATES AND NITROGEN LEVELS.



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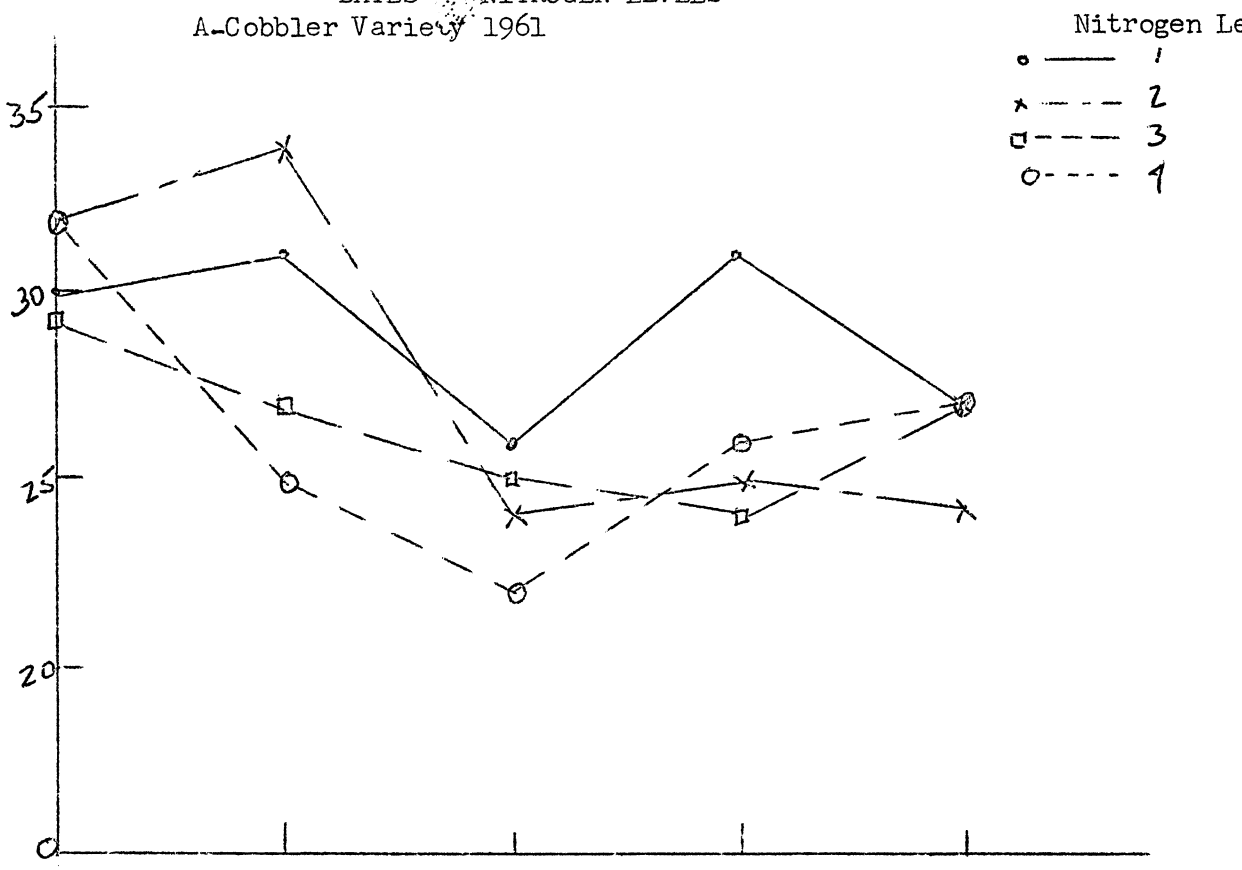
CHARTS III A AND B. RELATIONSHIP OF TUBER COUNT PER 8 POUND SAMPLE TO HARVEST DATES & NITROGEN LEVELS

A-Cobbler Variety 1961



B-KENNEBEC VARIETY 1961

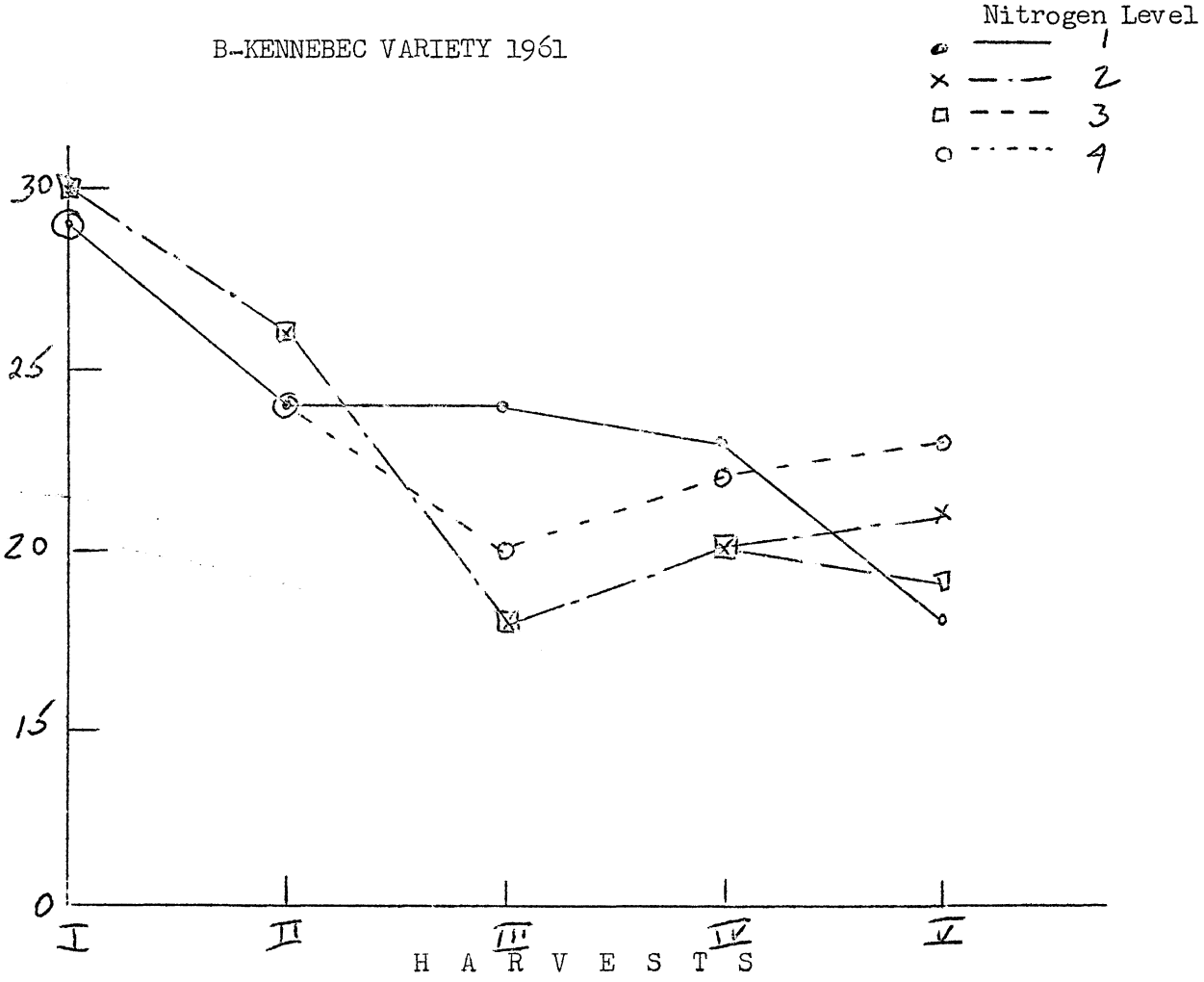


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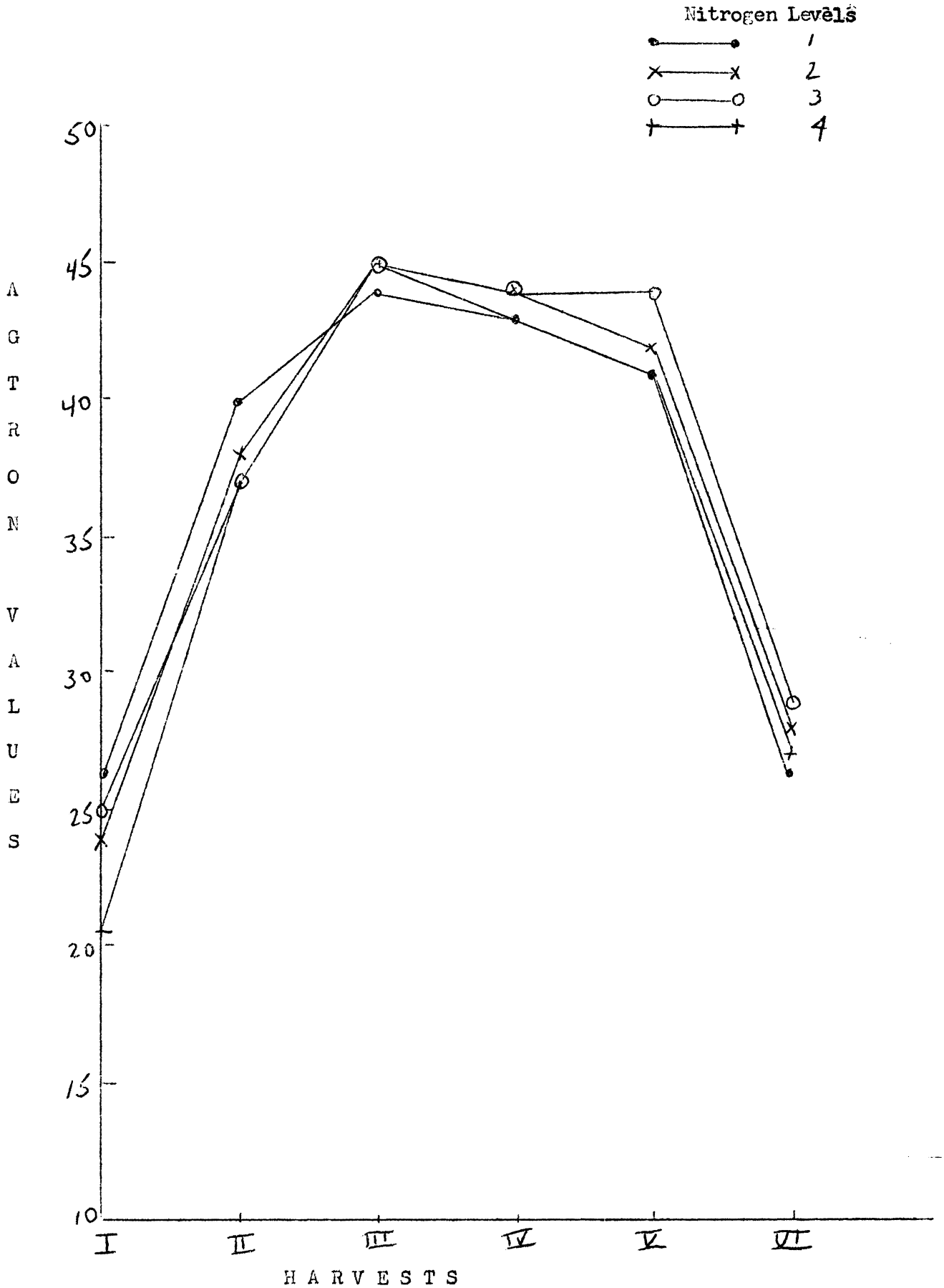
CHART IV RELATIONSHIP OF AGTRON COLOR TO HARVEST DATES AND NITROGEN LEVELS.



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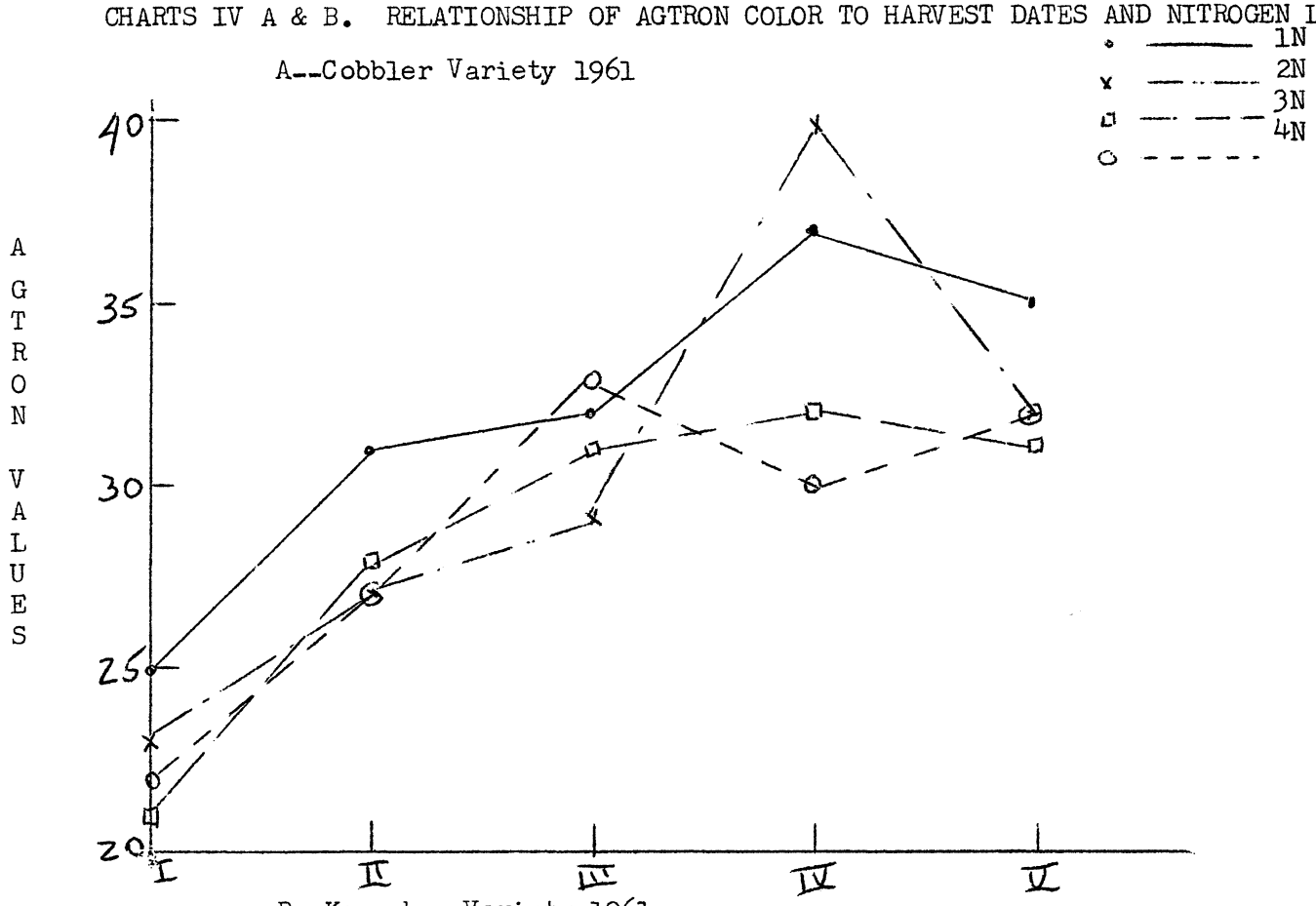
CHARTS IV A & B. RELATIONSHIP OF AGTRON COLOR TO HARVEST DATES AND NITROGEN LEVEL

A--Cobbler Variety 1961



B--Kennebec Variety 1961

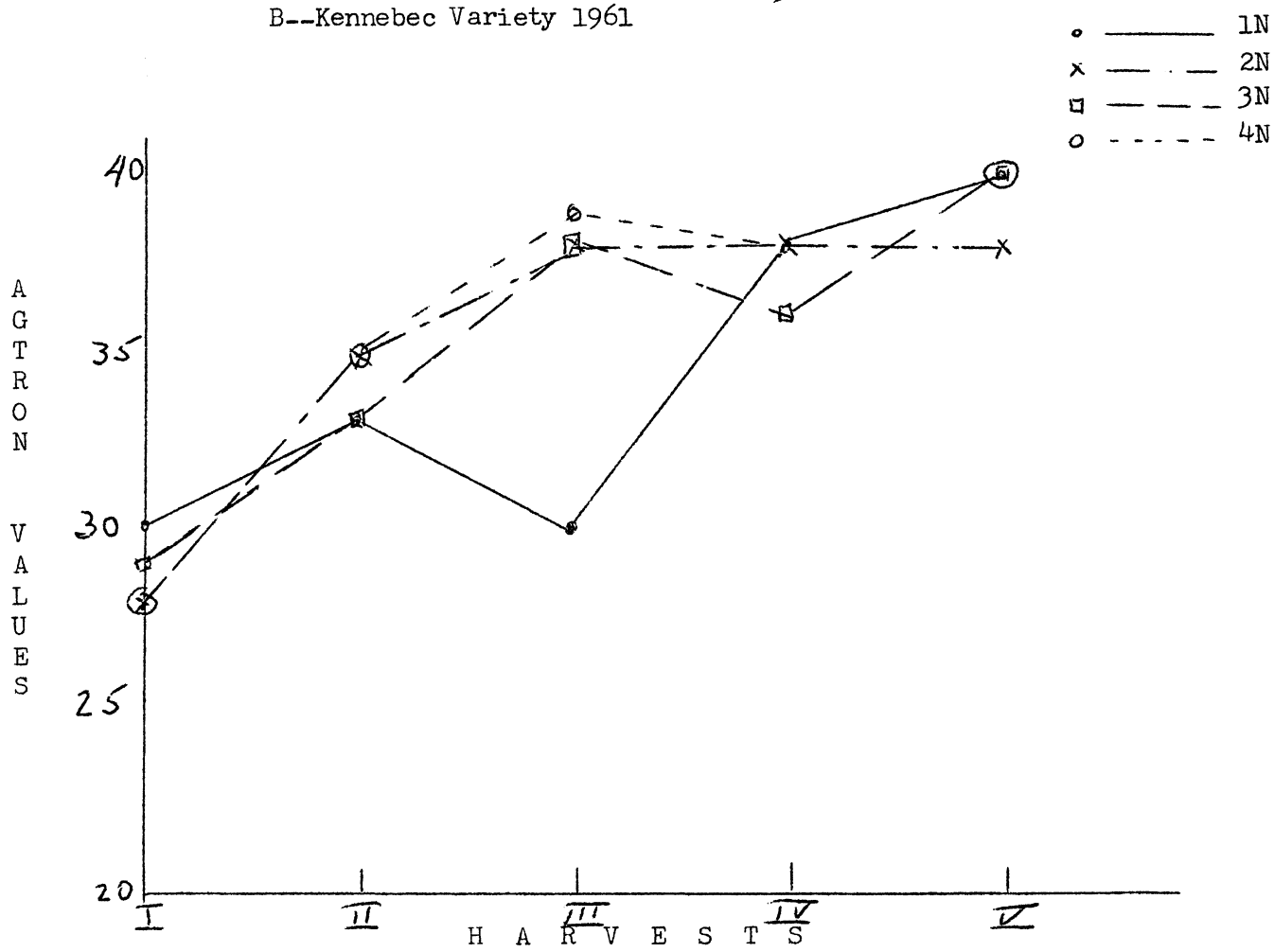


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TABLE I - Relationship of Agtron Color Scores to Harvests (I, II, III, LV, V, and VI) and Frying Days (1, 10, and 20) Following Storage by Nitrogen Levels and Storage Lots.

		HARVESTS																	
		I			II			III			IV			V			VI		
LOTS	N	1	10	20	1	10	20	1	10	20	1	10	20	1	10	20	1	10	20
Lot 1 (70-1)	1	27	25	22	37	38	40	41	41	38	42	42	37	41	40	37	25	28	30
	2	25	22	25	37	36	35	43	40	40	45	44	39	42	39	34	26	28	31
	3	28	22	21	37	29	28	41	41	39	44	46	40	44	41	33	29	29	29
	4	21	19	22	37	31	32	44	40	41	43	43	40	41	38	37	24	27	30
	$\bar{X}$	24	22	23	37	33	34	42	41	40	43	44	39	42	39	35	26	28	30
Lot 3 (70-3)	1	19	20	21	32	33	34	27	35	36	25	34	30	29	30	31	23	25	23
	2	19	21	20	28	27	30	24	32	34	30	33	33	29	27	32	20	22	24
	3	14	19	19	25	24	27	22	32	32	26	30	32	25	27	30	23	22	22
	4	15	17	17	23	25	23	22	31	34	25	30	29	25	26	30	19	22	21
	$\bar{X}$	17	19	19	27	27	29	24	32	34	27	32	31	27	28	31	22	23	23
Lot 4 (55-1)	1	17	17	17	22	23	29	25	27	29	28	28	26	23	26	26	20	21	31
	2	18	18	19	23	22	23	23	26	33	27	23	27	23	23	28	21	26	32
	3	14	14	14	18	18	22	20	28	30	27	26	26	22	26	24	17	23	31
	4	13	12	14	18	18	21	19	27	27	23	22	26	23	23	24	17	24	29
	$\bar{X}$	15	15	16	20	20	24	21	27	30	26	24	26	23	25	25	18	23	30
Lot 5 (55-2)	1	15	18	17	24	26	27	25	31	34	19	29	33	26	27	31	23	24	27
	2	15	15	15	23	26	26	26	30	32	25	35	36	23	24	29	21	24	28
	3	13	13	14	17	21	21	20	27	28	26	29	32	24	26	29	22	24	28
	4	13	13	11	16	17	19	16	21	27	19	28	28	17	24	24	18	25	25
	$\bar{X}$	14	15	14	20	22	23	22	27	30	23	30	32	22	25	28	21	24	27
Lot 6 (55-3)	1	16		20	25	28	28	28	29	34	29	34	30	23	27	29	25	18	19
	2	16		23	23	27	28	27	29	29	27	32	30	25	29	26	21	21	20
	3	13		17	17	25	25	24	25	31	27	31	29	20	26	27	23	19	21
	4	15		16	16	23	21	20	21	22	22	26	27	21	26	27	20	14	18
	$\bar{X}$	15		19	21	26	25	25	26	29	26	31	29	22	27	27	22	18	19

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TABLE I - continued.

		HARVESTS															
		I			II			III			LV			V			VI		
LOTS	N	1	10	20	1	10	20	1	10	20	1	10	20	1	10	20	1	10	20
Lot 2 (70-2)	1	10	14	23	10	13	17	14	13	26	16	15	17	16	21	23	12	-	-
	2	10	14	19	9	14	17	14	14	17	15	17	22	17	24	22	11	-	-
	3	9	14	20	10	13	15	13	13	24	16	16	19	21	24	24	11	-	-
	4	9	12	23	9	12	14	13	13	22	18	17	19	17	24	21	10	-	-
	$\bar{X}$	10	14	21	10	13	16	14	13	22	16	16	19	18	23	23	11	-	-
Lot 7 (45-1)	1	6	-	17	10	15	21	12	11	18	13	16	19	9	15	18	7	11	14
	2	6	-	16	8	16	20	11	12	17	13	15	20	8	15	19	7	10	14
	3	6	-	13	7	14	16	11	11	20	12	16	22	8	16	20	8	11	13
	4	6	-	14	8	12	17	10	10	18	12	14	20	7	13	15	8	10	15
	$\bar{X}$	6	-	15	8	14	19	11	11	18	12	15	20	8	15	18	8	11	14
Lot 8 (45-2)	1	8	12	15	10	10	23	13	14	-	9	15	18	9	14	19	12	16	19
	2	7	12	17	9	9	19	12	15	-	9	15	19	8	11	15	12	14	18
	3	7	11	14	9	8	19	11	13	-	9	20	15	9	12	15	12	14	16
	4	7	13	15	8	9	18	10	13	-	8	17	18	9	11	14	13	14	17
	$\bar{X}$	7	12	15	9	9	20	11	14	-	9	17	18	9	12	16	12	14	17
Lot 9 (45-3)	1	11	12	14	11	12	19	18	16	17	-	17	20	15	14	24	16	22	27
	2	12	12	21	9	14	16	16	17	22	-	18	20	16	16	22	14	23	24
	3	10	10	17	7	10	13	17	19	18	-	15	19	15	12	22	15	21	20
	4	8	10	16	8	10	16	15	17	17	-	14	20	15	13	22	13	18	22
	$\bar{X}$	10	11	17	9	11	16	16	17	18	-	16	20	15	14	23	14	21	23

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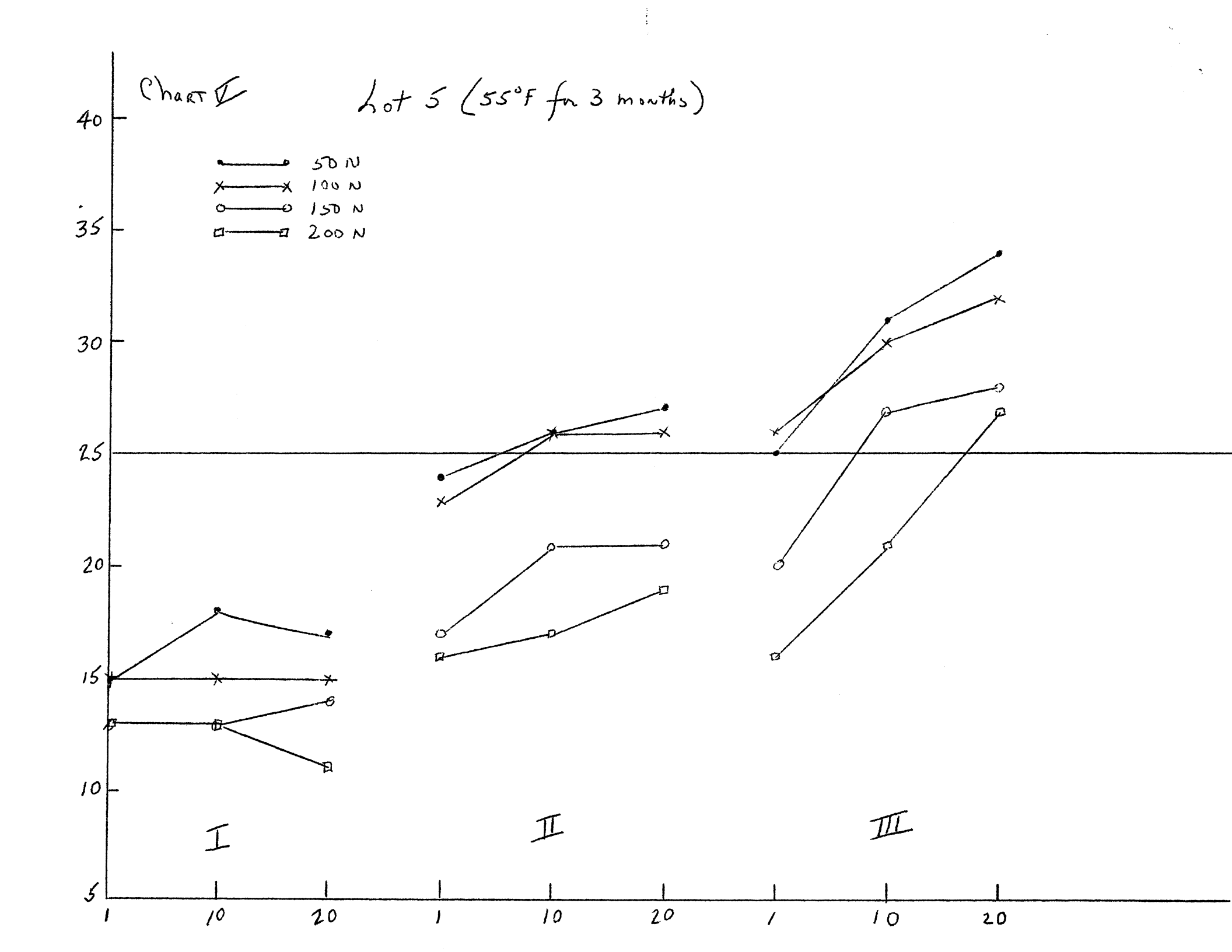
Chart V
Lot 5 (55°F for 3 months)
50 N
100 N
150 N
200 N
40
35
30
25
20
15
10
5
I
II
III
1
10
20
1
10
20
1
10
20

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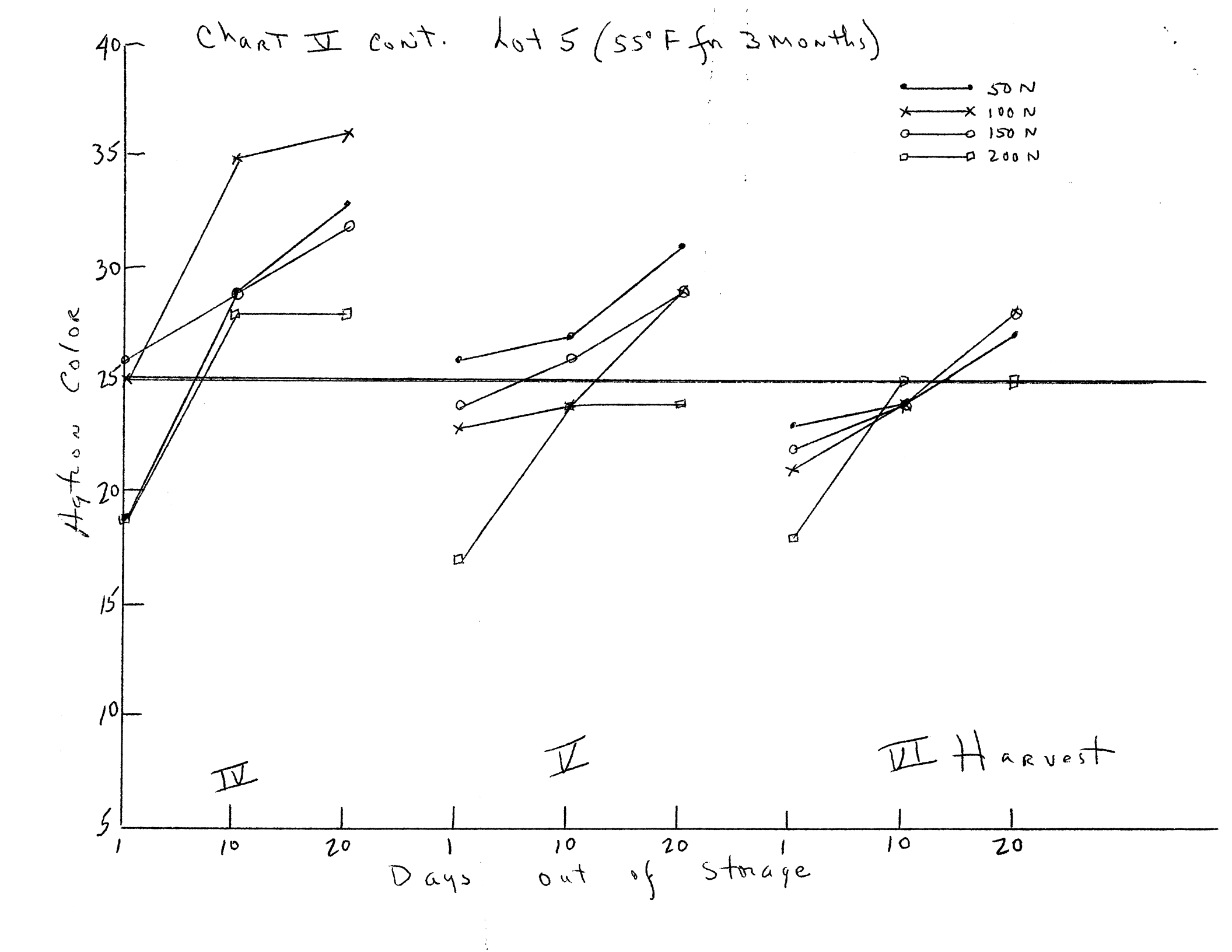
Chart II cont. Lot 5 (55° F for 3 months)
50 N
100 N
150 N
200 N
40
35
30
25
20
15
10
5
Hydrox Color
IV
V
VI Harvest
1
10
20
1
10
20
1
10
20
Days out of Storage

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