

Fertilizer Experiments at New Brunswick (N. J.) Summarized

By HOWARD B. SPRAGUE

I NTERPRETATION of fertilizer experiments conducted at any one location must be made in connection with the climatic conditions, the nature of the soil, and the kind of plants used. Fertilizer experiments at New Brunswick have been conducted on a heavy silt loam, medium in fertility, which is well drained but rather difficult to keep in good tilth. Twelve types of fertilization have been applied for two and one-half seasons on Virginia bent, and four types of fertilization have been applied to Metropolitan

bent for two seasons. Several additional treatments have been applied to Virginia bent for the season of 1928 only. Detailed results for these tests are given in tables which follow.

In general, any method of fertilization in which nitrogenous materials were used on Virginia bent reduced the abundance of weeds. Manure has increased the number of weeds considerably, probably because of weed seeds introduced. Ammonium sulfate was effective in making the soil acid; ammo-phos was nearly as effective; sulphur applications were also effective but injured the grass. Manure, alfalfa meal, a complete fertilizer, bone

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meal, and sodium nitrate, all tended to make the soil alkaline, the degree varying with the material. Lime was more effective than any of these in making the soil alkaline. Weeds were no more abundant on the plots made more alkaline than on those made more acid.

White clover was increased by organic fertilizers which contain phosphorous and potash in addition to nitrogen, but liming accompanied by nitrogen fertilizer alone did not increase clover. Annual bluegrass (*Poa annua*) was least troublesome where nitrogen only was added as a fertilizer. The soils made more alkaline by treatment, maintained vigorous turf for a longer period in the fall than those made more acid. Earthworm activities were far greater where organic fertilizers were used than where inorganic fertilizers were applied. Reducing the acidity also seemed beneficial to earthworms.

On Metropolitan bent grass, urea and cottonseed meal permitted more weed growth than sulfate of ammonia. Urea was nearly as effective in making the soil acid as ammonium sulfate but cottonseed meal had no effect whatever. Ammonium sulfate also appeared to be more effective in controlling white clover and annual bluegrass than urea or cottonseed meal. Cottonseed meal greatly increased earthworm activity.

One year's results with castor pomace showed no control of earthworm. Nitrophoska and milorganite did not increase or decrease abundance of clover and annual bluegrass during the first year. Fifteen pounds of lead arsenate per 1000 square feet applied in the top-dressing on Virginia bent (receiving twelve types of fertilization) reduced weeds, clover and annual bluegrass but did not give complete control. Earthworms were completely controlled by the lead arsenate treatment.

Table 1—Summary of Conditions on Virginia Bent Fertilizer Plots, November, 1928, at New Brunswick, N. J. Treatments Continued for 2½ Seasons.

Treatment.	Material applied per 1,000 sq. ft. per year. (Lbs.)	Nitrogen applied per 1,000 sq. ft. per year. (Lbs.)	Total dry weight of weeds per plot. (Gms.)	Acidity of soil. ¹ (Ph.)	White clover. (%)	Poa annua. (%)	Color and vigor on Nov. 10. ²	Earthworm casts Sept. 21, 1928. No. per 12 sq. ft.
None	.....	.....	2.96	6.2	28	33	m. to lt.	39
Sodium nitrate	18.75	2.85	1.54	6.8	11	17	m. to dk.	43
Ammonium sulfate	14.06	2.83	.58	5.4	6	16	m. to lt.	28
Ammo-phos	16.86	2.83	.83	5.7	8	20	light	26
Complete fertilizer (5-10-5)	70.24	2.83	.78	6.4	3	32	dk. to m.	47
Alfalfa meal	115.70	2.83	1.64	6.5	10	25	m. to dk.	91
Barnyard manure	688.70	.....	3.74	6.3	16	32	medium	34
Bone meal	117.08	2.83	1.07	6.6	10	37	dk. to m.	64
Light sulfur	6.89	.....	.....	.....	.....	.....	.....	.....
Ammonium nitrate	8.77	2.83	1.36	5.3	10	20	medium	28
Heavy sulfur	13.77	.....	.....	.....	.....	.....	.....	.....
Ammonium nitrate	8.77	2.83	.43	5.2	7	6	medium	18
Light hydr. lime	68.87	.....	.....	.....	.....	.....	.....	.....
Ammonium nitrate	8.77	2.83	1.61	8.0	4	12	dark	43
Heavy hydr. lime	137.74	.....	.....	.....	.....	.....	.....	.....
Ammonium nitrate	8.77	2.83	.64	8.1	3	18	dark	34

¹pH. is a means of expressing soil acidity. 7.0 is the figure for the neutral condition. Figures lower than 7.0 indicate acidity, the lower the figure the greater the acidity. Figures above 7.0 indicate alkalinity, the higher the figure the greater the alkalinity.

²"Dark" means rich green color—vigor good. "Light" means brownish or grayish green color—vigor poor. "Medium" indicates an intermediate condition.

Table 2—Summary of Conditions on Metropolitan Bent Fertilizer Plots, November, 1928, at New Brunswick, N. J. Treatments Continued for 2½ Seasons.

Treatment.	Material applied per 1,000 sq. ft. per year. (Lbs.)	Nitrogen applied per 1,000 sq. ft. per year. (Lbs.)	Total dry weight of weeds per plot. (Gms.)	Acidity of soil. ¹ (Ph.)	White clover. (%)	Poa annua. (%)	Color and vigor on Nov. 10. ²	Earthworm casts Sept. 21, 1928. No. per 12 sq. ft.
None	.....	.....	.41	6.2	15	13	light	33
Ammonium sulfate	14.06	2.83	.06	5.8	2	6	m. to d.	36
Urea	6.32	2.83	.29	5.9	6	18	medium	32
Cottonseed meal	44.46	2.83	.23	6.2	7	9	dark	81

¹pH. is a means of expressing soil acidity. 7.0 is the figure for the neutral condition. Figures lower than 7.0 indicate acidity, the lower the figure the greater the acidity. Figures above 7.0 indicate alkalinity, the higher the figure the greater the alkalinity.

²"Dark" means rich green color—vigor good. "Light" means brownish or grayish green color—vigor poor. "Medium" indicates an intermediate condition.

Table 4—Average Effect of Lead Arsenate on 12 Different Fertilizer Treatments, November, 1928, at New Brunswick, N. J.

	No lead arsenate.	Lead arsenate applied, 15 lbs. per 1,000 sq. ft. during the season of 1928.
Weeds per plot.....	3.51 grams	1.46 grams
White clover.....	6.6 per cent	5.4 per cent
Poa annua.....	18.4 per cent	12.6 per cent
Color and vigor.....	medium	Medium
Earthworm casts per 12 sq. ft.....	41	1

Table 3—Comparison of Miscellaneous Fertilizers on Virginia Bent, November, 1928, at New Brunswick, N. J. Treatment for One Season Only.

Treatment.	Nitrogen applied per 1,000 sq. ft. per season. (Lbs.)	White clover. (%)	Poa annua. (%)	Color and vigor.	Earthworm casts, Sept. 21, 1928. No. per 12 sq. ft.
None.....		10	10	light	50
Ammonium sulfate.....	1.41	10	15	medium	32
Ammonium sulfate.....	2.83	3	10	medium	16
Ammonium sulfate.....	4.24	2	12	dark	15
None.....		13	8	light	20
Nitrophoska.....	2.83	10	13	med. to dk.	8
None.....		15	3	light	41
Castor pomace.....	2.83	2	10	medium	46
None.....		10	2	light	37
Milorganite.....	2.83	15	5	medium	25

Club Billing Methods and Policies Are Presented

Carl Truax leads off with conclusion of his article started in May GOLFDOM and Walter Adams puts up his idea

EXPERIENCE and experiment indicate clearly that best collection results are obtained by mailing on the last day of the month or the first day following. Most postoffices are congested for several days after the first as every line of business is sending out statements. To get prompt delivery by carrier it is necessary to avoid the congestion by mailing ahead of it. At many postoffices this congestion is really serious. Inquiry at your postoffice will determine this situation for any manager. (In this connection we might add that your mailings should always be faced, cornered, sorted by postoffices, labelled and tied. It will pay to inquire about this. Some offices ask this—others do not care.)

Bills deposited in the postoffice not later than 5 p. m. of the first (it will be well to ascertain your postoffice's tying time) should reach the members ahead of most of their monthly bills and statements. Managers who have never mailed this early will be surprised at the result if such early mailing is followed up consistently.

Most by-laws provide for posting in 30 days after the bills are mailed. If bills are mailed the first, the manager has the collection situation well in hand as he is in position to post on the 1st. of the following month and the members realize that they cannot wait over and pay last month's club bill out of the following month's income. The late bill is a clear invitation to the members to hold the club bill over for payment out of cash receipts around the first of the following month.

Beware a change during the season! Any manager who has been mailing his members' bills late in the month—with collections dragging into the following month—and who wishes to advance his mailing date will do well to wait for the closed season when only dues are being billed—before this change is made—or else advance the date one or two days per month until the desired date has been attained. An abrupt change would have the effect of doubling up on the chronic laggards who will in such case complain loudly.