sponding rise in the total phosphate content of this layer. The clay content and base-exchange capacity of the indurated horizon are lower than the horizons above and below it.

The content of organic matter in the freely drained soils decreases gradually down the profile, whereas in the poorly drained soils the *A* horizon tends to be lower than that of the freely drained and decreases sharply below this in the gley horizon. The *p*H of the poorly drained soils is generally somewhat higher than that of the freely drained soils. The silica sesquioxide ratios down the poorly drained profiles fluctuate in an erratic manner and alternate with a periodicity from high to low. It is suggested that it is due to the periodicity in fluctuation of the level of the ground-water of these soils.

The high total phosphate in the *A* horizon of the freely drained soil as compared with the parent material suggests that applied phosphate may be accumulated more readily in the unavailable form in the naturally freely drained soils.

The striking reduction in the amount of the total phosphate and the high, readily soluble phosphate in the *G* horizons of the poorly drained soils is possibly related to the reducing conditions. This points to a loss of phosphate in the ground-water from these soils.

These several trends in the phosphate status of soils of different drainage conditions are being investigated.

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Vernalization of Sugar Beet

In connexion with L. G. G. Warne's experiments on the vernalization of lettuce reported recently[1], we are able to confirm that the vernalization treatment given after radicle emergence had occurred has no effect on the bolting of sugar beets.

Field experiments were carried out last year near Tirlemont (Belgium) with 'Hilleshög' beets. Several sets of seeds were soaked for seventy-two hours, according to E. Larose and R. Vanderwalle[2], by which time germination had begun and radicles emerged here and there. After soaking, seven sets (III to IX) were held at 2–3° C. during periods varying from ten to seventy days. Two control sets (I and II) were not given the low-temperature treatment; (I) seeds were not soaked, (II) seeds were soaked during seventy-two hours. The nine sets were sown in the open on April 16 (six repetitions of two hundred beets for each set).

Compared with the control sets, the thirty to seventy days vernalized seeds emerged from the soil later, and the growth of the seedlings was seriously delayed during the first six weeks; the differences grew less apparent in June, and after the middle of July all the sets were showing the same development. The beets were harvested on October 24. As appears in the accompanying table, practically no bolting occurred, but there were many missing beets among the fifty, sixty and seventy days vernalized sets. Moreover, the low-temperature treatment showed no effect on the yield of the crop.

These observations confirm Dr. Warne's opinion as to the possibility of avoiding the undesirable influence of natural vernalization on sugar beets and other crop plants by the sowing of already germinated seeds. Further experiments would, of course, be necessary to determine, for each plant, the appropriate soaking conditions of the seeds and the timing of the vernalization treatments.

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[1] Warne, L. G. G., *Nature*, **159**, 31 (1947).
[2] Larose, E., and Vanderwalle, R., *Bull. Inst. Agric. et Stat. Rech. Gembloux*, **2**, 163 (1936).

Correlation between Yield of Wheat and Temperature during Ripening of Grain

During the last five years investigations have been undertaken at this Institute for evolving a reliable method for obtaining varieties of wheat best suited to 'dry' as well as irrigated tracts, and also for determining their drought resistance. To achieve this purpose, a large number of exotic and Indian varieties of wheat (260 in all) have been grown on dry and irrigated plots of well-manured land at Delhi, Karnal and Pusa. The Indian varieties used in these experiments were representative of the important wheat-growing tracts of this country with their vegetative period ranging from 90 to 130 days, while the exotic varieties with a range of 90–170 days were representative of the important wheat belts of Canada, the U.S.S.R., Great Britain, Australia and other countries. All these varieties form a part of the large collection of wheat varieties maintained at this Institute.

Growth and harvest data, together with the dates of flowering and ripening of grain, were recorded. As the results appear to have some practical value, a brief preliminary report of the work is given here. It is intended to publish the full details of the work elsewhere. Some of the results are summarized in the accompanying diagram.

	Treatment	% missing beets	Bolters %	Roots		Sugar		Sugar		Leaves	
				Kgm.-ha.	±e	%	±e	Kgm.-ha.	±e	Kgm.-ha.	±e
1	Control	5	0	48,143	457	18·42	0·07	8872	103	38,420	1065
2	Soaked	5·5	0	49,011	488	18·56	0·10	9102	133	42,365	1100
3	Soaked, 10 days vernal.	5	0·08	47,320	493	18·67	0·10	8838	125	40,459	1407
4	,, 20 ,, ,,	4·6	0	48,573	228	18·53	0·06	9002	51	42,562	685
5	,, 30 ,, ,,	5·8	0	48,385	549	18·75	0·06	9072	96	41,887	855
6	,, 40 ,, ,,	5·1	0	48,067	291	18·53	0·06	8908	66	42,421	1217
7	,, 50 ,, ,,	13·7	0	46,218	482	18·47	0·11	8539	113	38,647	1312
8	,, 60 ,, ,,	15·2	0·10	46,195	810	18·37	0·07	8491	165	40,836	1179
9	,, 70 ,, ,,	9·2	0·18	47,893	465	18·55	0·09	8891	112	41,138	713