

Lawn Care

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PLANT HORMONES AND VITAMINS

THIS past season has seen alert gardeners throughout the country hopefully trying the various synthetic plant hormones and vitamins. Many of them grasped at the mystic growth promoting materials as a boon to rocking-chair gardening and an end to all plant ills. Some have emerged enthusiastic while others have concluded that they were the victims of wishful thinking.

Hormone History

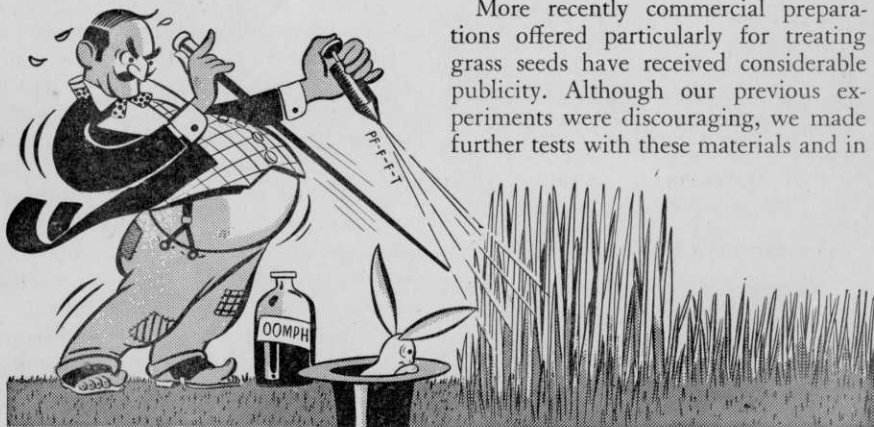
The possibility of producing better lawns through the application of hormone substances aroused our interest in 1935 when Dr. P. W. Zimmerman and Dr. A. E. Hitchcock of Boyce Thompson Institute for Plant Research demonstrated the weird, uncanny effect produced when the stems of growing plants were treated with one of sixteen or more chemicals discovered in the laboratory. By the use of some of these growth substances, called plant "hor-

mones," roots were made to sprout from any place on the stem of the plant.

For this ingenious contribution to science the two men were awarded a substantial cash prize by the American Association for the Advancement of Science, at its annual meeting in 1935.

At that time, many of the news periodicals carried articles inferring that the recent discovery had opened an era of "miracle" growth for plant life. Mindful of the interests of thousands of lawn owners, we began investigating at once the possibility of using plant hormones on grass seed as well as in the planting of Creeping Bent Stolons. At the Boyce Thompson Institute further experiments were conducted. In no cases could encouraging results be reported in speeding up seed germination, increasing root growth of plants from hormone treated seed or hastening development of stolons into turf.

More recently commercial preparations offered particularly for treating grass seeds have received considerable publicity. Although our previous experiments were discouraging, we made further tests with these materials and in



addition searched for controlled, unbiased trials by independent authorities. Many reliable turf experts have tried out the growth substances but we were unable to find one experiment station or similar agency which could substantiate claims for quicker germination and greater root growth.

The following findings are typical:

P. W. Zimmerman of the Boyce Thompson Institute: "My opinion is that it isn't practical at this time to treat seed with growth substances. The cost of the treatment is considerable and the returns are very doubtful."

H. B. Sprague of the New Jersey Experiment Station: "There is little satisfactory evidence regarding the value of treating seeds with hormone preparations to increase rooting."

H. B. Musser of Pennsylvania State College: "I put in a series of tests last year, using the growth substance powder on seeds and stolons. This was in August and I watched the plants carefully all through the fall (1938). The only possible difference there may have been was in the heavy doses. There was some indication of injury."

In October, 1939, Professor Musser reported: "Upon the basis of observational data we have been unable to see any difference in turf growth rates or densities up to the present time."

It is evident that turf authorities have been unable to find that the artificial growth substances helped the grass in any particular way. There were several reports of reduced or delayed germination but such could hardly be held against the material employed since there are many other factors involved.

Fundamentals Govern Germination

Treating the tender tissues of certain plants with growth substances will stimulate root development of cuttings or slips, but there is no scientific evidence to verify a similar claim for

grass seed. There is still no magic way to stimulate seed germination. As always, soil warmth, moisture and light are the main factors modifying germination. Seed quality is another important factor. Some seeds are dead and never will sprout. Scientists have shown that some seeds require an extra time for maturing or ripening or even need to be subjected to cold temperatures for a time to insure maximum germination. There is definitely an optimum period for germination and properly selected seed will produce the best results.

The proper technique in soil preparation determines to a large degree whether or not every viable seed will sprout. A firm seed bed is essential to hold the moisture bearing soil particles in close contact with the seed. The seed must not be planted too deeply or it will be slow in sprouting due to the cooler temperature just beneath the soil surface. Soil warmth is necessary, preferably alternating in degree as, for example, warm days and cool nights.

Plant Vitamins

Besides hormones which influence the growth of various plant parts, there are also plant vitamins. These are micro-foods, playing much the same role in the plant diet as they do in human lives. They are essential in minute quantities to the nutrition of plant as well as animal life.

The origin of all the furor about plant vitamins is found in some California research in hydroponics, the science of soil-less gardening. This experimental practice involves the growing of plants in solutions without soil. The roots of a growing plant serve only as an intake for nutrients and not as physical support of the plant also. The framework of wire, stakes and strings supports the growing plant while its roots drink from the solution below.

In soil-less gardening, the diet of the plant may be carefully controlled by the

composition of the nutrient solution. Growth results were quite astonishing when certain vitamin concentrates were added to the tank of liquid which was substituted for the soil.

Those who heard of the amazing influence of vitamins jumped to the conclusion that similar results would follow application of these vitamins to all growing plants. They overlooked the fact that the experiment had been conducted on an artificial rooting medium such as plain water or sterile sand and not with the average lawn and garden soil found in most parts of the country.

Plants Produce Vitamin B₁

As pointed out in a press release from the Department of Floriculture of Ohio State University, the complex chemical B₁ is manufactured in the leaves of practically all plants. From there it is transported to the roots where further growth continues. As plant residues decompose, they provide a source of B₁. Soils containing enough humus to support lasting turf also contain natural sources of B₁ and no benefits are derived from additional applications.

As in the case of hormone substances, we have been unable to find any unbiased, controlled tests that show beneficial results to turf grasses from applications of Vitamin B₁. Research in recent years has proven grass blades to be exceptionally potent in their content of B₁ and other vitamins, so grass plants evidently find a plentiful supply of raw materials in most soils.

It seems unlikely that turf could make any appreciable use of the almost immeasurably minute quantities of vitamins suggested for treatment, although in the case of ornamental plants some benefit may be derived. The claim is made that vitamin solutions may be helpful in transplanting certain plants but here again actual experimental data seem to be meager.

To refer to the literature again, we quote from a March bulletin of the

Boyce Thompson Institute: "It is concluded that before any general practical use of Vitamin B₁ can be recommended for a soil amendment, more substantial data are needed than have been published to date."

From a July publication of the Ohio Experimental Station: "From many writings, gardeners are led to believe that a miracle substance has been found, one that will put an end to all plant ills. It is apparent from results that much of the publicity that Vitamin B₁ has received is unwarranted. Undoubtedly applications of the vitamin will prove beneficial in some plants subjected to certain specific conditions, but gardeners should not expect spectacular results from its general use."

Many reports of "astonishing success" have apparently come from enthusiastic users who failed to check or control their treatments. Gardening practices, such as extra fertilizing, additional cultivation or watering, may have caused the favorable results reported.

Good Lawns Are Planned

At the present time there is no evidence of a magic formula or miracle substance for producing good turf. First-class lawns are the result of the use of high quality seeds on a well prepared seed bed. In successful lawn maintenance there is no substitute for a good fertilizer. Extra vitamins do not replace the need for a special grass food. In fact, scientists report that vitamins and hormones are ineffective unless the plants on which they are used have been well fertilized. It stands to reason that if the grass is fed properly in the first place it will be able to manufacture the normal requirements of hormones and other growth promoting substances.

Healthy lawns are fed regularly for the purpose of restoring those essential elements exhausted by growth, namely nitrogen, phosphorus, and potash. If applied in a fertilizer of the right com-

bination, these nutrients produce a balanced growth of grass, with sufficient roots to support healthy foliage. The functions of a tiny grass plant are as complicated as those of a large tree. Each one takes up its raw material from the soil and makes use of sunlight and air to convert this into plant tissue. It seems quite unlikely that a synthetic material developed over a brief period of time will revolutionize the slow evolution of plant life.

Late Seeding Chalks Up Another Success

LAST fall, readers of Life magazine got a glimpse of high school football as it is played at Massillon, Ohio. The article included action pictures of the championship football team and the crack 64-piece band.

Back of this well-deserved fame lies an interesting story of the development of Massillon's new athletic plant. The old field, well remembered for the exceptional turf, saw its last game in 1938. Larger quarters were needed and the move was made to a tract of land known as Sippo Park. Here a new field was constructed. It went on duty with the opening of the season last year.

Not content with a football field, however, farsighted school authorities planned a layout more complete than most colleges enjoy. In addition to a football practice field, there were to be a baseball diamond and a band practice field. All these totaled up to about ten acres and the main requisite was good turf. Varied soil conditions and differences in the use of the areas offered us interesting grass growing problems.

One of these problems was the matter of time. Because of the large scale grad-

ing required and the fact that hand labor had to be used, it was impossible to get all ten acres ready for seeding in early fall. It is generally recognized that early fall is the best time of the entire year to construct new lawns, but at Massillon Field only a few incidental areas were completed in time to take advantage of September weather.

On November 6 the band practice field was ready for fertilizing and seeding. Sowing of the baseball field and football practice field was completed just ten days before Christmas.

Naturally there was nervousness and shaking of heads over this unorthodox procedure of putting good seed on frozen ground. Came the winter, the worst in 20 years; then a cold, wet spring. Folks began to lose hope. It just didn't seem that any seed could be vigorous enough to survive.

But it did. When the sun finally began to warm the soil, the seed began to swell. Green sprouts appeared. By early May the entire expanse had a uniform growth of young grass and a brilliant green color. Slowly but surely the turf continued to develop. This fall, these areas go into service.

Dormant seeding is not a new and untried idea. Many similar case histories are on file in our office. The experience of Massillon only adds to the preponderance of evidence, putting the stamp of approval on dormant seeding.

Our own tests, as well as those of several experiment stations, lead to but one conclusion: If at all possible, complete fall seedings in September. But if, as in the case of Massillon, that should be out of the question, then go right ahead with soil preparation and seed as late as necessary.

O. M. SCOTT & SONS CO.



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