

# GIBBERELLINS

## Stimulators Can Speed Growth, But Root Development May Lag Behind

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The new plant growth promoting substances, gibberellins, are considered by many authorities to be the most important discovery in horticultural research since the advent of 2,4-D. Gibberellins are extracted from a fungus and manufactured in the same way as the antibiotics used in modern medicine.

The primary effect of treating plants with gibberellins (gibberellic acid is one of about six gibberellin-like materials) is that of stem cell elongation. These materials stimulate growth when applied at concentrations of 10 to several hundred parts per million without causing any deleterious effects to the plants. This is in contrast to other synthetic growth regulators such as 2,4-D which can only be used in a narrow range of concentration.

### Variety of Effects

In addition to stem elongation, treatment of plants with gibberellins has been reported to induce earlier flowering in annual plants, break dormancy where this is caused by cold weather, and hasten germination of many types of seed.

In experiments at the University of Arizona a number of bedding plants were treated with sprays of gibberellic acid to learn if the material would cause earlier flowering. Sprays of 100 and 200 parts per million of gibberellic acid, applied three times at weekly intervals, had only a slight effect on elongating the stems of stocks and snapdragons and did not cause earlier flowering.

On the other hand, in the case of petunia, calendula and pansy, three sprays of gibberellic acid caused the treated plants to flower from 10 days to two weeks earlier than untreated control plants. This particular effect on petunia is illustrated in the photograph, where treated plants are in full flower and have

**OUR COVER PICTURE** shows dwarf beans, comparing those where seed was soaked 24 hours in gibberellic acid with the slower growth of those soaked 24 hours in water.

**CITRUS SEEDLINGS**, at left, sprayed with gibberellic acid shot upward rapidly, but their root growth was much poorer than that in seedlings, shown at right, not given gibberellic treatment.

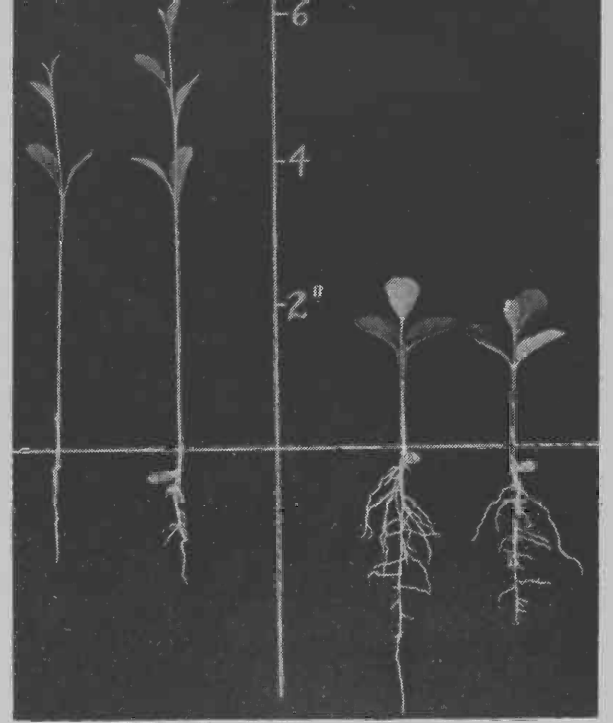
slightly elongated stems compared with the shorter untreated plants which were not yet flowering.

### Seeds Germinate Quicker

Another effect of gibberellic acid which is being investigated is that of accelerating seed germination. Seeds of dwarf beans soaked for 24 hours in a solution of gibberellic acid germinated from four days to a week earlier than seed which was soaked only in water. Our cover picture shows how seedlings from seed treated with gibberellic acid are four to five times taller than those which are just emerging from untreated seed.

In addition to some of these interesting and perhaps beneficial effects of gibberellic acid, we have been watching for effects which might not be so advantageous. In some of the bedding plants it was noted that plants sprayed with gibberellic acid had a lighter green foliage than the untreated plants.

**BELOW**, Petunia plants not treated and sprayed with gibberellic acid.



### Root Growth Deficient

In many instances increased growth above ground resulting from treatment with gibberellic acid has been at the expense of developing a normal or adequate root system. This is illustrated in the photograph of citrus seedlings, two of which were sprayed with gibberellic acid. The above ground portion of treated plants is several times taller than the untreated plants, but the root systems on treated plants are much smaller than those of the untreated plants.

Currently we are experimenting to learn the effects of gibberellic acid on deciduous fruit trees, on cantaloup and on grape vines. Some of our preliminary experiments and reports from other localities indicate the possibility of using gibberellic acid to break the dormancy of deciduous fruit trees which have not received a sufficient amount of winter chilling.

