Table 1. EFFECTS OF GIBBERELLIC ACID ON EXCISED ROOTS OF MINERVA MAPLE AND WINTER MAPLE

Variety	Concentration G.A. (mgm./l.)	Length of root (mm.)	
		Passage 1	Passage 2
Minerva Maple	0	77·6 ± 7·0*	87·5 ± 10·0*
	0·5	71·8 ± 4·0	90·6 ± 7·7
	25·0	89·0 ± 8·7	83·5 ± 9·5
Winter Maple	0	41·9 ± 1·8	15·7 ± 2·1
	0·5	48·8 ± 2·5	25·8 ± 1·1
	25·0	46·7 ± 1·7	14·7 ± 2·1

G.A., Gibberellic acid. * Standard error.

is not a dwarf variety, were grown in an inorganic medium the roots grew much more rapidly than the excised roots in sterile culture. The above results may indicate that one of the factors limiting the growth of the excised roots of Winter Maple is a gibberellic acid-like substance.

The most striking effect of gibberellic acid on the excised roots, however, was on the development of root hairs. In most plants, root hairs are formed much more readily in moist air than in water[3]. In excised pea roots some hairs form on the tissue of the inoculum but the major part of the root is normally hairless. However, in the presence of gibberellic acid root hairs continued to develop in an acropetal manner, the youngest occurring on the tissue which had just completed extension growth. The covering of hairs was considerably denser at 25 mgm./l. than at 0·5 mgm./l. In Minerva the hairs were quite normal in appearance. In Winter Maple the hairs were shorter than in Minerva and at the higher concentration of gibberellic acid they tended to swell at the tip, the region of the hair which is generally believed to exhibit the greatest plasticity[3].

That gibberellic acid stimulates the normal development of hairs on excised roots raises the possibility that substances of this type may participate in the formation of these structures in intact plants.

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Reversal of Genetic Dwarfism in *Tephrosia vogelii* by Gibberellin

IN conjunction with a breeding programme designed to produce plants of *Tephrosia vogelii* Hook f. with a higher rotenone content, multiple crosses were made between two lines of similar morphology, but of separate geographical origin. Nine dwarf plants were obtained as segregants in an F_2 population of 103 individuals. These dwarfs were characterized by greatly reduced internodes, hypocotyls, petioles, and rachises. Leaflets were also much smaller, and leaf colour was a darker green than normal. The number of leaves per plant, the number of leaflets on corresponding leaves, and the size and colour of the cotyledons were unaffected.

The potassium salt of gibberellic acid in an aqueous solution of 100 p.p.m. was applied in the form of a light spray to three of the dwarf plants. Three additional dwarf plants were sprayed with indoleacetic acid at 100 p.p.m., and the remaining three were sprayed with water as a control. The initial applications were made approximately one month after germination, and an additional spraying was given one week later. After responses to gibberellin were noted, two of the plants in this treatment were withheld from further applications, while one plant continued receiving weekly treatments of gibberellin.

Elongation of the petioles, rachises and leaflets was observed one week after the initial application of gibberellin. Leaves and internodes which had elongated prior to treatment were unaffected. Two weeks after the initial treatment with gibberellin, the three plants showed elongated internodes and leaves which were identical in appearance to those of normal seedlings. Normal growth continued in the plant which received additional periodical treatments of gibberellin. In those plants which were withdrawn from the gibberellin treatment after two applications, the dwarf condition reappeared gradually, and one month after the last treatment the plant was indistinguishable from the dwarf controls except for the elongated stem produced during the period of gibberellin treatment. These results indicate that the dwarf segregants of *T. vogelii* are completely dependent on periodic applications of gibberellin for normal growth.

Fig. 1. Seedlings of *Tephrosia vogelii* Hook f. showing a normal F_2 seedling, an untreated dwarf segregant, a dwarf treated with indoleacetic acid, a dwarf treated and then withdrawn from gibberellin, and a dwarf on continued gibberellin treatment

There was no growth response in plants treated with indoleacetic acid when compared to the controls. Fig. 1 shows (from left to right) a normal seedling of *T. vogelii*, an untreated dwarf segregant, a dwarf treated with indoleacetic acid, a dwarf treated with gibberellin for two weeks and then withdrawn, and a dwarf which has continued to receive periodical applications of gibberellin. A similar reversal of genetic dwarfism in other legumes[1] and in maize[2] has been reported.

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