

Table 1. Effects of growth regulators, absorbed by the roots, on growth, development and sex expressions in hemp plants

Treatment	Height of plants (cm) ^a			Appearance of flower buds ^b	Percent of plants ^a		
	Male	Female	Intersexes		Male	Female	Intersexes
Control	31 ± 1.7	16 ± 1.2	25 ± 2.1	12	29 ± 1.2	37 ± 2.3	34 ± 1.1
GA ₃	46 ± 2.3	39 ± 1.8	41 ± 1.6	8	84 ± 2.6	7 ± 0.4	9 ± 0.7
BAP	—	7 ± 0.3	8 ± 0.2	12	0	47 ± 1.8	53 ± 3.2
IAA	—	17 ± 1.0	27 ± 1.3	16	0	40 ± 2.0	60 ± 2.8
ABA	27 ± 1.4	15 ± 0.7	22 ± 2.7	12	20 ± 1.3	39 ± 1.4	42 ± 1.8

^a Mean ± standard error^b Days after beginning of hormone treatment**Fig. 2a-c.** Effect of growth regulators, applied through the roots, on sex expression in hemp. **a** Effect of GA₃: left, 6 control plants (3 male, 3 female); right, 5 treated plants (all male). **b** Effect of BAP: 6 treated plants, 3 female ones (left) and 3 intersexes (right). **c** Effect of IAA: 4 treated plants, 2 female ones (left) and 2 intersexes (right)

of hemp plants of this age (2–3 leaf pairs), on subsequent sex expression.

Seeds of hemp, strain US-6, obtained from the Institute of Fiber Crops, Glukhov, USSR, were germinated for 3 d in the dark on filter paper soaked with water, at 25° C. Plantlets selected for roots of equal length were then placed with their roots in 1- or 3-l containers with water for 2 d, and after this for 24 h in solutions of growth regulators. The treatments, with 70 plants each, were: 1) control (water); 2) 25 mg/l gibberellic acid (GA₃); 3) 15 mg/l 6-benzylaminopurine (BAP); 4) 15 mg/l indole-3-acetic acid (IAA); and 5) 10 mg/l abscisic acid (ABA). After treatment, the plants were first placed into 1/10-strength Knop nutrient solution, and after 2 d transferred to half-strength Knop and after another 2 d

to full-strength Knop. The nutrient solution was aerated daily. Before, during and after treatment the plants were kept in the greenhouse, on 8-h short days, until sex expression was clearly apparent. An overall view of the plants near the end of the experiment is shown in Figure 1.

The results are summarized in Table 1. At the concentrations used GA₃ promoted the growth of the shoots while BAP inhibited it; in the other treatments growth did not differ from that of the controls. The leaves of the BAP-treated plants were dark green, those of the GA₃-treated ones yellowish-green. After 15 d of growth, swellings appeared in the roots of