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Growth Studies with Hemp (*Cannabis sativa* L.)

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Growth studies with hemp (*Cannabis sativa* L).

Abstract

The effect of latitude, sowing date and density on yield, height and growing time were studied by sowing two varieties of hemp for seed at three sites in New Zealand. Predation and poor germination hampered results. Latitude effects on height could not be confirmed but Anka, unlike Finola, suffered a reduction in height with later sowing. Anka was the larger plant with higher seed yield, but the dwarfed Finola gave a higher harvest index. Thus seed yield for later sowing is reduced for cv Anka, unchanged for cv Finola. Plant density data allowed estimated yields at 30, 60 and 90 plants.m⁻² to be determined. At 30 plants.m⁻², seed yield in both varieties was reduced with later sowing, and confirmed Anka with the greater gross yield against Finola having the higher harvest index. At 60 and 90 plt.m⁻², the results confirmed only that Anka is the bigger plant. Earlier sowing than the 1st sowing in our trial (October) could be an advantage. Higher sowing rates than 40-50 plt.m⁻² would be of little advantage for Anka, but rates higher than 90 plt.m⁻² should be explored for Finola. The asymptotic yield maximum for Anka falls dramatically with later sowing, whereas Finola does not. This suggests double cropping might be explored, with an early sowing of Anka followed by Finola. Growing time data indicated the lower latitude site had longer growing times overall. Day length sensitivity (shorter growing time with later sowing) was confirmed for Anka, but Finola was unaffected. This suggests Finola is a day-length neutral plant. Leaf production in both varieties was higher at higher latitudes, and was reduced by later sowing date.

A second experiment examined the nitrogen and phosphorus uptake of a fibre hemp cultivar (EIL1) with respect to three sowing dates and two latitudes. Harvests were taken monthly to establish growth trends. From biomass figures, equations were established for leaf/stem relationships. Uptake values (on a dry matter basis) tended to stabilize as the plant matured at: N(stem) 3.04%, N(leaf) 4.5%, P(stem) 0.26% and P(leaf) 0.45%. High initial concentration of both N and P fell rapidly. For maximum uptake seed should be sown early (October or earlier) and plants grown as long as possible (5 months or more).

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