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**INFLUENCE OF WATER QUALITY ON CHLORIDE CONTENT
OF FLUE-CURED TOBACCO**

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SUMMARY

Irrigation with river water containing levels of chloride ranging from 13 to 32 p.p.m. during the growing season of tobacco resulted in the production of cured leaf with a chloride content higher than desirable.

High chloride content of flue-cured tobacco adversely affects leaf quality (Garner *et al.* 1930; Attoe 1946; Myhre, Attoe, and Ogden 1956) and its commercial acceptability. Crack and Chippendale (1961) reported the results of investigations on chloride accumulation under furrow irrigation in tobacco-growing soils of the Burdekin Irrigation Area in North Queensland. *Inter alia*, they reported that the build-up in soil chloride and chloride uptake by the crop could be accounted for by the chloride added in the irrigation water, which usually contains 30-40 p.p.m. Cl during the growing season.

This paper reports results obtained from a small observation trial carried out at the Millaroo Research Station, on the Burdekin River, in the 1963-64 tobacco season, in which the effects of irrigation with water from the Burdekin River and with rain-water on the chloride content of cured leaf were compared.

Two 1/165 ac plots (three rows, 22 ft row length) of furrow-irrigated tobacco were grown on an area of Elkin Sandy Loam, on which the previous crops had been beans and maize. The middle row of each plot was harvested for experimental purposes.

Of these two plots, one was irrigated with 40 gal of river water per row at each irrigation; the other received a similar quantity of rain-water per row. This application rate is equivalent to a 1-in. irrigation. This procedure was used for the planting-out irrigation on September 12, 1963, and for the 10 irrigations subsequently applied until the end of December. During this period, 1.52 in. of rainfall was recorded.

Leaf from the plots was harvested and cured normally and samples of the cured leaf taken for chloride determination. The results obtained are presented in Table 1.

TABLE 1
CHLORIDE CONTENT (% Cl) OF OVEN-DRY
LAMINA OF CURED LEAF

Picking Date	River Water	Rain-water
2.xii.63 ..	2.10	0.85
17.xii.63 ..	1.41	0.80
31.xii.63 ..	1.48	0.66
7.i.64 ..	1.32	0.68
16.i.64 ..	1.38	0.89
23.i.64 ..	1.51	1.12

If a chloride content of 1% in the leaf lamina is regarded as marginal for the commercial acceptability of Australian flue-cured tobacco leaf, it is seen from Table 1 that the leaf produced on the river water plot is unacceptable. However, the leaf produced on the rain-water plot, with the exception of the last pick, on this criterion falls within the limit of acceptability.

Samples of river water collected during the period of the trial contained 13 p.p.m. chloride in September at the commencement of the growing season. The highest chloride concentration recorded during this season was 32 p.p.m. in water samples collected in November. These concentrations are somewhat lower than those reported by Crack and Chippendale (1961), who also recorded higher chloride concentrations in cured leaf.

Under the conditions in which tobacco was grown in the Burdekin area, the use of irrigation water of reasonable quality (<30 p.p.m. Cl) resulted in the production of tobacco leaf with higher than desirable chloride content. The figures presented suggest that for the production, under furrow irrigation, of tobacco having a satisfactory chloride content, irrigation water containing very low levels of chloride is required.

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