

REMOVAL OF LEAD ARSENATE FROM GREEN TOBACCO LEAF

About 1950 the area of irrigated tobacco crops was expanded in Queensland, and consequently field planting in spring, rather than as previously after early summer rains, became general practice. As a result the pest status of the tobacco looper (*Plusia argentifera* Gn.) was increased considerably. This insect when in large numbers was not controlled satisfactorily by the insecticides used for other pests at that time, and lead arsenate, which had been used for many years for controlling leaf pests of tobacco, was applied intensively during the later stages of crop growth. During the 1951-52 season quantities of Queensland leaf were condemned because of excessive arsenic residues: the official tolerance is 1 grain As_2O_3 per lb. of moisture-free cured leaf.

The sound approach to the solving of residue problems is prevention, i.e. replacing the offending insecticide. This was done quickly and the use of arsenic is no longer necessary for controlling pests in Queensland tobacco fields (see Smith 1955). At the same time, however, some attention was given to the removal of lead arsenate from green leaf.

A dipping trial was carried out at Ayr during 1953. Following preliminary laboratory investigations the dip used contained 0.25 per cent. w/w HCl ($5\frac{1}{2}$ pt. commercial concentrate in 100 gal. water) and 0.25 per cent. detergent (22 per cent. secondary alkyl sulphate).

Leaf with arsenic residue was obtained from a crop planted on Sept. 12 and sprayed five times with lead arsenate (3 lb./50 gal.) and DDT (0.1 per cent.). The total spray used was at the rate of 426 gal. per acre, and the final application was made six days before harvesting on Jan. 7. During the growing period 4.6 in. of rain fell on seven wet days.

Twenty of the 24 sticks of leaf were successively dipped and agitated for 30 sec. in 60 gal. of the acid-detergent dip, drained for 30 sec., rinsed twice in 60 gal. of water, drained and then cured.

Analyses of cured leaf (approx. $1\frac{1}{2}$ lb. per stick) are given in order of dipping in Table 1: sticks Nos. 21-24 comprised the control.

These analytical results indicate that arsenic residue can be removed from green leaf by dipping, but other factors would limit the commercial use of this method. For convenience, residues in Table 1 have been grouped, and the increase in average suggests that to keep residues below tolerance level either fairly frequent renewal of dipping fluids or topping up would be required.

Furthermore, although the quality of both treated and control leaf was variable and mostly poor, that of the former was distinctly papery.

Table 1.
RESULTS OF 1952-53 TRIAL.

| Stick No. | As ₂ O ₃ residue (grains/lb.). |
|-----------|--|
| 1 .. | 1.12 |
| 2 .. | 1.12 |
| 3 .. | 0.70 |
| 4 .. | 0.42 |
| 5 .. | 0.42 |
| 6 .. | 0.84 |
| 7 .. | 0.56 |
| 8 .. | 0.28 |
| 9 .. | 0.56 |
| 10 .. | 1.12 |
| 11 .. | 0.42 |
| 12 .. | 1.40 |
| 13 .. | 0.98 |
| 14 .. | 1.96 |
| 15 .. | 1.54 |
| 16 .. | 1.40 |
| 17 .. | 1.40 |
| 18 .. | 0.98 |
| 19 .. | 2.66 |
| 20 .. | 1.54 |
| 21 .. | 18.48 |
| 22 .. | 22.40 |
| 23 .. | 9.24 |
| 24 .. | 13.30 |

This trial was repeated at Inglewood during March 1955: the results were similar.

REFERENCE.

SMITH, W. A. 1953. Control of tobacco pests. Qd Agric. J. 81: 87-90.

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