

# Pesticide Residues in 1972 Cigars

by

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Pending legislation by a number of governments concerning objectionable pesticide residues on tobacco and tobacco products has led to steps that would minimize these residues. Guthrie (1972) has summarized these legislative restrictions and discussed actions that must be taken for U. S. tobacco and tobacco products to comply with these proposed restrictions.

A number of surveys for pesticide residues on tobacco and tobacco products have been undertaken (Domanski et al. 1973, Domanski and Sheets 1973, Lawson et al. 1964, Sheets and Jackson 1970). These surveys on commercial products have dealt predominantly with residues on cigarettes and have provided only cursory information on the nature of the pesticide residues on other tobacco products. The purpose of this study is to report pesticide residues on U. S. cigars.

Lawson et al. (1964) reported that 3 brands of cigars purchased in 1962 averaged 44 ppm TDE+DDT and concluded that high residues on cigars were probably due to the high residues on the wrapper leaf. This high pesticide level on wrapper tobaccos is due to the need for a leaf nearly free from insect damage, as even one or two small holes may render the leaf unsuitable for cigar wrapper use. In order to attain this degree of protection, as many as 15 insecticide applications are applied during the growing season. Tappan et al. (1967) reported the residue levels on cured and fermented cigar wrapper tobacco which had been field-treated with DDT, endosulfan, and parathion at various rates and intervals prior to harvest. They concluded that if effective insect control was to be maintained, relatively high residues of these pesticides were inevitable.

In this study, six brands of cigars were analyzed; four of which were chosen because they normally use Florida cigar-wrapper tobaccos. These brands were not analyzed in 1969 or 1971 (Domanski et al. 1973, Sheets and Jackson 1970).

## Experimental

In April 1972, six different brands of cigars were purchased in Lexington, Kentucky; Portland, Oregon; Raleigh, North Carolina; Washington, D. C.; and Tallahassee, Florida. Each

sample consisted of five cigars of each brand from each location. Brands 1, 2, 3, and 4 were chosen because normal use of Florida wrapper tobacco is high. The individual samples of each brand were composited. The cigars were macerated in a Wiley Mill and the composited samples mixed thoroughly before subsampling for analysis. All samples were analyzed for DDT, TDE, endrin, toxaphene, and endosulfan by electron-capture gas chromatography (Domanski *et al.* 1972) and for parathion and paraoxon by flame-photometric gas chromatography (Siluttamabucha 1972). Residue values were corrected to 13% moisture content of the product.

TABLE 1  
Pesticide Residues in 1972 Cigars

Brand	TDE+DDT <sup>a</sup> (ppm)	Total endosulfan <sup>b</sup> (ppm)	Endrin (ppm)	Paraoxon (ppm)	Parathion (ppm)	Toxaphene (ppm)
1	16.43	0.64	0.08	<0.08	0.10	<0.5
2	19.51	0.26	<0.05	<0.08	0.03	<0.5
3	10.51	0.63	0.05	<0.08	0.06	3.42
4	23.39	0.36	0.08	<0.08	0.04	2.01
5	10.51	0.49	0.10	<0.08	0.03	<0.5
6	10.99	<0.20	<0.05	<0.08	<0.03	<0.5
Avg	15.22	0.41	0.06	<0.08	0.05	0.92

<sup>a</sup>Total TDE = p,p'-TDE + o,p-TDE + p,p'-TDEE.

Total DDT = p,p'-DDT + o,p-DDT + p,p'-DDE.

<sup>b</sup>Total endosulfan = endosulfan I + endosulfan II + endosulfan sulfate.

## Results and Discussion

The results of these analyses are given in Table 1. In contrast to other tobacco products (Domanski *et al.* 1973, Lawson *et al.* 1964, Sheets and Jackson 1970), the TDE+DDT residues in cigars were composed mainly of DDT. The TDE levels ranged from 1.9 to 6.6 ppm, while DDT levels ranged from 7.9 to 17.6 ppm. The six brands of cigars show little difference in residue levels of DDT, TDE, endrin, and endosulfan from cigar samples in 1969 (Sheets and Jackson 1970) and 1971 (Domanski *et al.* 1973). Although parathion was detected in all brands, the highest residue was only 0.1 ppm. Paraoxon could not be detected in any sample.

Toxaphene, which has not been reported in cigars previously, was found at relatively high levels in brands 3 and 4, but brands 1 and 2, which are also normally manufactured from Florida cigar wrappers, contained no detectable toxaphene residue. This may reflect the selective buying patterns of the different manufacturers. The presence of toxaphene is particularly disturbing since it is not registered for use on tobacco and its use has been discouraged for many years. In general, all brands contained residues of one or more insecticides over the proposed tolerances (Guthrie 1972).

## Acknowledgment

The authors wish to express their appreciation to Patricia L. Haire for her technical assistance.

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