

values are still high enough to be of concern. This reduction in pesticide content is the most abrupt and of the greatest magnitude that has occurred since the survey program was begun.

It is not possible to give the exact reasons for the improved milk situation. At this time it will suffice to say that the total effort in Arizona is beginning to reduce the pesticide content and it is hoped this effort will result in a continued decline during the months ahead.

Pesticide Drift Studies

(P. D. Gerhardt and J. M. Witt)

Downwind drift tests comparing sprays and dusts have consistently shown dusts to drift farther than sprays at about a 4 to 1 ratio.

Graph #3 shows an example of a drift curve from a typical experiment. The 0.5 parts per million level is pointed out because this for a time was considered to be the maximum level in the feed of dairy cows which would not result in a pesticide content in milk fat in excess of an "analytical zero" level of 2.5 parts per million. This "analytical zero" has now been reduced to 1.25 parts per million. It is therefore necessary to reduce the acceptable ("safe") pesticide residue level in feed (including alfalfa hay) from 0.5 to 0.25 parts per million in order to meet these new federal requirements.

Downwind drift limits for pesticide sprays and dusts

Table #1 gives a summary of data from several experiments using different insecticides. The drift limits shown are the approximate distances downwind from the treated, or "target" crop beyond which deposits of drifted pesticides on alfalfa (later cut, baled, and fed to dairy cows,) are considered unlikely under the conditions assumed below to produce pesticide residues in milk in excess of specified "analytical zero" values. These figures are based on field records and laboratory analyses from pesticide drift experiments, conducted in central Arizona over a period of years. Drift limits are affected by differences in atmospheric conditions, localities, pesticides used, and other factors. It is necessary to approximately double the limits for 0.5 parts per million to reach the 0.25 p.p.m. level required to meet the current "analytical zero" in milk fat of 1.25 p.p.m.

The drift limits summarized in Table 1 are based on the following assumptions:

1. 2 to 5 miles per hour air velocity.
2. A temperature inversion (negative lapse rate) of 2 to 4 degrees, F., at a height of 24 feet (7.5 meters).
3. Pesticide residues in baled alfalfa hay, from drift for the distance shown, of 0.5 parts per million and of 0.25 p.p.m. These amounts may be expected to produce pesticide residues in milk fat below "analytical zero" values of 2.5 and 1.25 p.p.m., respectively. Actual residues on baled hay could be much lower or much higher, depending on the pesticide used.
4. A hay curing ratio (weight loss due to drying) of 4 to 1. (It could be as low as 2.5 to 1).

Graph No. 3

SUMMARY OF DOWNWIND DRIFT LIMITS - COMPARISON OF DUST vs SPRAY

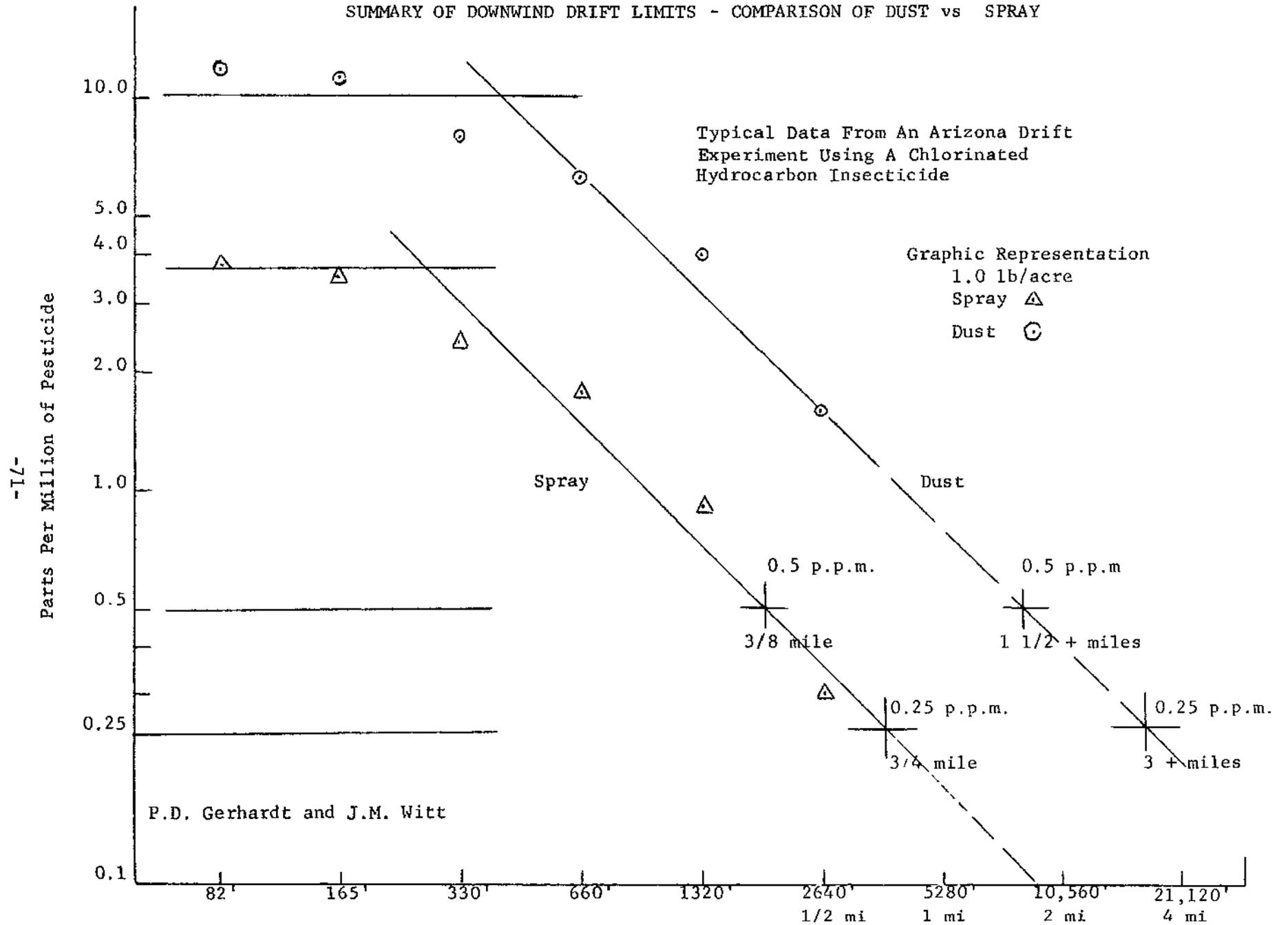


TABLE 1. PESTICIDE DRIFT LIMITS (Based on assumptions in text).
Limits are expressed as approximate downwind distances beyond which pesticide residues on baled alfalfa hay are unlikely to exceed 0.5 or 0.25 parts per million.

Amount of Pesticide (toxicant) applied per acre to target crop	Kind of Application	Target Crop 500 feet wide Pesticide Residue on hay (parts per million)		Target Crop 1320 feet wide (1/4 mile) Pesticide Residue on hay (parts per million)	
		0.5	0.25	0.5	0.25
one pound	Spray	900 ft. 3/16 mi.	1800 ft. 3/8 mi.	1700 ft. 3/8 mi.	3400 ft. 3/4 mi.
	Dust	3400 ft. 3/4 mi.	6800 ft. 1 1/4 mi.	6800 ft. 1 1/4 mi.	13,600 ft. 2 1/2 mi.
two pounds	Spray	1300 ft. 1/4 mi.	2600 ft. 1/2 mi.	3100 ft. 5/8 mi.	6200 ft. 1 1/4 mi.
	Dust	6000 ft. 1 1/8 mi.	12,000 ft. 2 1/4 mi.	11,000 ft. 2 mi.	22,000 ft. 4 mi.
three pounds	Spray	2000 ft. 3/8 mi.	4000 ft. 3/4 mi.	5100 ft. 1 mi.	10,200 ft. 2 mi.
	Dust	8000 ft. 1 1/2 mi.	16,000 ft. 3 mi.	19,500 ft. 3 3/4 mi.	39,000 ft. 7 1/2 mi.

5. Application of the pesticide to the target crop 14 days before the date of cutting and baling the downwind alfalfa hay crop (could be 1 - 42 days).
6. A pesticide residue half life of 7 days (could be 3.5 to 14 days).
7. Target crop widths of 500 feet and 1320 feet (1/4 mile).

COTTON PRODUCTION - Disease Control

During 1964, a number of demonstration-tests were conducted with the cooperation of research, extension personnel and farmers.

Cotton rootknot nematode control plots were established in Pinal, Pima, Santa Cruz and Yuma Counties. Generally, the results indicate that in cases where the infestation of nematodes is high that control fumigation may be of benefit. However, the cost of the materials and application make the margin of profit quite small. Therefore, it appears that the decision as to whether or not to control nematodes in cotton with nematicides will have to be made by the individual grower, depending on his particular situation. Rotation remains the cheapest method of control.

Damping-off or soreskin of cotton remains as a problem to cotton growers. The severity of the disease is influenced markedly by the weather during and following planting. Plots were established at the Marana Experiment Station and with several growers in Yuma County to evaluate seed treatment materials, in-furrow fungicides and precision planting. These plots served as both demonstration and test plots. Results indicate that double seed treatment with a mercurial material such as Panogen 15 and with PCNB adequately control the disease in most situations. However, it appears that in a few fields an in-furrow application of PCNB may be beneficial. The cost of such treatment may limit widespread use.

Soil Fumigant Trials

(Arlen D. Davison)

Cooperator - Boswell Farms, Pinal County

Objective: Control of Rootknot Nematode in Cotton

Treatments:

1. DBCP (Fumazone 86) - 1 gpa or 12# tech.
2. Telone - 12 gpa.
3. Check - untreated except chiseled

Replication: 4

Sealing: Cultipacked

Plot Size: 4 rows/plot

Variety: Deltapine Smooth Leaf

Date of Fumigation: March 30, 1964

Soil Moisture: Excellent

Soil Temp.: 60° F. at 6" depth

Crop Residue: Few cotton stalks