flurenol led to normal fruit shapes when pollination did not occur. The hybrid cultivars used in the present experiment appeared to have an adequate amount of female flowers without the use of ethephon, for maximum effectiveness of chlorflurenol.

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LABELLING INSECTICIDES FOR USE IN FIELDS OF CHINESE CABBAGE AND ENDIVE[1]

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Additional index words. EPA, IR-4, methamidophos, mevinphos, residues.

Abstract. **Methamidophos (O,S-dimethyl phosphoramidothioate) (1.0 lb. a.i./acre) and mevinphos (2-carbomethoxy-1-methyl-vinyl dimethyl phosphate) (0.5 and 1.0 lb. a.i./acre) were evaluated for phytotoxicity and residue levels in Chinese cabbage** (Brassica campestris **L.) and endive** (Cichorium endivia **L.). Phytotoxicity was not observed on plants in any of the trials. Methamidophos concentrations in Chinese cabbage and endive harvested 28 days after last application were less than 0.02 ppm and 0.60 ppm, respectively. Mevinphos concentrations in Chinese cabbage or endive harvested 3 or 4 days after last application at high dosage rates were less than 2.65 ppm and 1.64 ppm, respectively. This data is being combined with information from other states and will be submitted to EPA for tolerances and subsequent labelling by way of the IR-4 program.**

Grown primarily on the mucklands of Zellwood and the Everglades, Chinese cabbage and endive occupy no more than 7,000 acres and are considered to be minor crops in Florida (1). Seeding of both crops begins in August and they are transplanted weekly so that fresh leafy vegetables may be harvested throughout the winter months until late May.

The long growing period provides conditions for a steady build up of insect pests including aphids, armyworms, foliar caterpillars, leaf hoppers and cutworms. With only a limited number of insecticides labelled for these uses, i.e., diazinon for endive and methomyl for Chinese cabbage, growers were left with inadequate means of insect control.

Several Florida growers and University scientists requested the USDA supported IR-4 program (2) for help in obtaining necessary labels. A number of insecticide use patterns were requested and the IR-4 program staff prioritized each submission.

The insecticides methamidophos (Monitor) and mevinphos (Phosdrin) were selected as IR-4 projects in 1983 since they had a proven record of insect control, had strong industry acceptance and EPA indicated that there were no data impediments. Field trials were established to test the growth effects and insecticide levels of these on Chinese cabbage and endive.

Materials and Methods

Three-wk old 'Jade Pagoda' Chinese cabbage and 'Green Curl White Rib' endive plants were transplanted into sandy loam soil (pH 5.1). The plants grew to maturity in 70 days where average daily temperatures varied between 72° and 46°F and there was a total rainfall of 9.22 inches.

Plants were set out 1 ft apart in rows 2 ft apart. Thirty two plots 6 ft by 30 ft were measured, and arranged into a randomized complete block design. Treatments consisted of nonsprayed controls, methamidophos (1.0 lb. a.i./acre) and mevinphos (0.5 and 1.0 lb. a.i./acre) applied at weekly intervals. Each treatment was replicated 4 times. Each insecticide was applied 4 times: methamidophos commencing February 18 and mevinphos starting March 18.

At a specific time the entire head of 4 plants were sampled from each plot and frozen immediately for subsequent pesticide residue analysis. Methamidophos treated plants were sampled 21 and 28 days after last application. Chinese cabbage treated with 0.5 and 1.0 lb. a.i./acre mevinphos were sampled 1 and 3 days respectively after last application. Endive treated with 0.5 and 1.0 lb. a.i./acre mevinphos were sampled 2 and 4 days, respectively after last application.

Samples treated with mevinphos were extracted with ethyl acetate and concentrated for analysis by gas chromatography using a modification of a procedure described by Shell Oil Co. (4).

Samples treated with methamidophos were extracted with acetone, partitioned with methylene chloride and

[1]Florida Agricultural Experiment Stations Journal Series No. 5114.

petroleum ether and concentrated for analysis by gas chromatography using the Luke procedure for multiresidue analysis (3).

Results and Discussion

Appreciable insect populations did not appear in the plots, therefore, efficacy of the 2 insecticides could not be tested. Currnt labels for the uses of mevinphos and methamidophos on lettuce indicate that these insecticides control aphids, cutworms and lepidopterous larvae.

There was no injury or damage noticed in plants growing in treated plots during weekly observations. Total yields from plants in treated plots were not statistically different from those in nontreated control plots (Table 1).

Table 1. Yield of Chinese cabbage and endive treated with insecticides.

Treatment	Yield (lb./plot) Chinese cabbage	Endive
Methamidophos (1.0 lb. a.i./acre)[z]	31.7 a[y]	10.0 a
Mevinphos (0.5 lb. a.i./acre)	29.0 a	6.5 a
(1.0 lb. a.i./acre)	24.7 a	7.7 a
Nontreated controls	29.3 a	7.9 a

[z]Field application rate.
[y]Mean separation in columns by Duncan's multiple range test, 5% level.

The range of methamidophos and mevinphos residues detected in samples of Chinese cabbage and endive are reported in Table 2. The amount of methamidophos residue detected in Chinese cabbage was substantially less than that in endive. Residue levels of mevinphos in Chinese cabbage and endive were similar.

The preharvest interval had a significant effect in lowering the level of methamidophos residues in endive and mevinphos residues in Chinese cabbage and endive. Methamidophos residues detected in endive harvested 28 days preharvest interval were less than 25% of those in endive harvested 21 days after last application. Even though the dosage rate of mevinphos was 1 lb. a.i./acre instead of 0.5 lb., the amount of detectable residues were reduced approximately 50% when harvest was delayed 2 days.

Table 2. Insecticide residues detected on Chinese cabbage and endive.

Treatment	Chinese cabbage Residue (ppm)[z]	Endive Residue (ppm)[z]
Methamidophos (1.0 lb. a.i./acre)[y]		
21 day PHI[x]	.01-.05	1.38-2.88
28 day PHI	<.01	0.08-0.60
Mevinphos		
1 day PHI (0.5 lb. a.i./acre)	2.50-4.10	—
2 day PHI (0.5 lb. a.i./acre)	—	2.28-3.64
3 day PHI (1.0 lb. a.i./acre)	1.50-2.65	—
4 day PHI (1.0 lb. a.i./acre)	—	0.89-1.64

[z]Range of residues determined from 4 replicated samples.
[y]Field application rate.
[x]Days between last application and harvest.

These data will be combined with data from trials in other states and information from the pesticide manufacturers and assembled by IR-4 into packages for submission to EPA. Petitions will be prepared and sent to EPA for the establishment of national tolerances. If tolerances are granted, the pesticide manufacturers will prepare labels which are approved by EPA for printing.

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AN ECONOMIC ANALYSIS OF PRODUCING AND MARKETING COLE CROPS IN NORTH AND WEST FLORIDA[1]

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Additional index words. cash expenses, fixed costs, break-even yields, broccoli, cauliflower, net returns, market alternatives.

Abstract. **The cole group of vegetables are adaptable to many parts of Florida. Particular interest has been expressed in North and West Florida for growing broccoli** (Brassica oleracea **L. cllalica Group) and cauliflower** (Brassica olerearea **L. Botrytis Group). The climatic conditions are suitable for broccoli and cauliflower production from early October through mid-May. A sizeable investment is required to produce broccoli and cauliflower which suggests careful economic planning by prospective producers. The availability of markets and alternatives is also important to vegetable producers since profits are often dependent on the producer's ability to sell the crop. Enterprise budgets are developed in the paper to aid producers in their decision making. Per acre net returns at various yields and prices are also developed to illustrate different profit potentials. The information developed in this paper should be useful for broccoli and cauliflower producers to make production, financing, and management control plans.**

The cole group of vegetables are very adaptable in many locations of Florida where fertile soils and sufficient moisture are available. In North and West Florida particular interest has been given to broccoli and cauliflower production. Both broccoli and cauliflower have shown a fresh market increase

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