



Agricultural Chemical Usage - Vegetables Methodology and Quality Measures

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Vegetable Chemical Usage Survey Methodology

Scope and Purpose: The National Agricultural Statistics Service (NASS) Vegetable Chemical Use program collects entire farm level chemical use data from growers of select vegetables in program States. The fruit and vegetable chemical surveys have been conducted in alternating years since 1990 with data collected on fruits in odd numbered years and vegetables in even numbered years. The States involved and the commodities surveyed are selected based on NASS acres planted and evaluated each cycle to ensure maximum coverage. NASS aims to cover at a minimum 80 percent of acres planted. Farm level data are combined during summary and, pending compliance with disclosure rules, published at State and National levels. Data are published for 24 crops in 19 States. Carrots, Cucumbers, Snap Beans, Sweet Corn, and Tomatoes are published by both fresh market and processing dispositions.

Survey Timeline: Data collection begins on October 1 and lasts until mid January of the following year to ensure completion of the crop year. NASS Field Offices (FOs) along with NASS Headquarters (HQ) spend the next several months reviewing reported data for reasonableness and conduct producer follow-ups, as necessary. The estimates are released to the NASS Quick Stats system during the last week in July.

Sample Size, Sampling Frames, and Methods: The sample for the Vegetable Chemical Use Survey (VCUS) is selected from the NASS List Sampling Frame. List incompleteness is addressed through the estimators. The sample design for VCUS is Multivariate Probability Proportional to Size (MPPS). In MPPS, the maximum of the probabilities of selection over all of the target crops that an operation grows is used in combination with the desired sample sizes for each crop to draw the sample. The larger the operation's maximum probability is, the larger the operation's chance of being selected for the sample.

VCUS is a two-phase sample design. In Phase 1, the screening phase, list frame control data are used to determine the probabilities of selection. The operations selected in Phase 1 are interviewed in the Integrated Screening Survey to determine if they are growing any of the crops of interest and the number of acres planted. In Phase 2, the results from the Integrated Screening Survey are used to select the final sample for the survey. Both the Phase 1 and Phase 2 sample selections use MPPS designs.

In Phase 2, operations with multiple operating arrangements are sub-sampled. Only the sub-sampled operations are contacted for data collection.

The sample size for the VCUS is approximately 4,500.

Data Collection and Editing: All federal data collections require approval by the Office of Management and Budget (OMB). NASS must document the public need for the data, show the design applies sound statistical practice, ensure the data do not already exist elsewhere, and show that the public is not excessively burdened. The vegetable chemical use questionnaires must display an active OMB number that gives NASS the authority to conduct the survey, a statement of the purpose of the survey and the use of the data being collected, a response burden statement that gives an estimate of the time required to complete the form, a confidentiality statement that the respondent's information will be protected from disclosure, and a statement that response to the survey is voluntary and not required by law.

Using these questionnaires, chemical data are collected only by personal visit from an enumerator. Letters are mailed out to producers prior to field contact informing them of the importance of cooperation and that contact will be made in the coming weeks. Once contact is made by the field enumerator, an appointment will be set up to collect data when the farm operator indicates no further chemical applications are remaining. The field enumerator returns the questionnaires to the NASS field office for editing and data entry. Questionnaire responses are captured and edited for consistency using automated systems, and a report of questionnaires with errors is generated. NASS field office statisticians will correct the errors on the report or comment to their validity if the data are deemed to be correct. Records with errors can pass to summary only with field statistician comments and HQ acceptance.

Analysis Tools: Chemical use data are processed through an interactive data analysis tool which displays data for all reports by product or commodity. This application tool provides various scatter plots, graphs, tables, charts, and listing tools that allow the analyst to compare an individual record to other similar records within their state or at a national level. Outliers and unusual data relationships are investigated by FO and HQ statisticians to determine if they are correct. Suspect data found to be in error are corrected, while data found to be correct are kept.

Nonsampling Errors: Nonsampling errors are present in any survey process. These errors include reporting, recording, editing, and imputation errors. Steps are taken to minimize the impact of these errors, such as comprehensive interviewer training, validation and verification of processing systems, detailed computer edits, and the analysis tool. Re-contact with respondents is conducted on an as needed basis.

Nonresponse Adjustment: Response to the VCUS is voluntary. Some producers refuse to participate in the survey, others cannot be located during the data collection period, and some submit incomplete reports. These nonrespondents must be accounted for if accurate estimates of total chemical usage are to be made. For this survey, item level nonresponse is accounted for by imputing data where there are missing values. Imputed rates of application for chemicals are calculated through an automated imputation system that calculates an unweighted mean for an imputation group based on commodity, state, and product. When a group lacks sufficient responses, groups are collapsed by state to preserve as much homogeneity as possible.

Calibration: Calibration is a weighting technique used in survey sampling to adjust the survey weights for sampled elements so that the weighted sum of a set of benchmark variables equals a pre-determined set of values for the population. The input to the calibration algorithm is the weights generated from the sampling procedures. Sampling weights are calculated based on numerous factors so that the sample allocation can be representative of the entire population of farms at the state level for the target vegetable crops in that state. Due to survey nonresponse and the possibility of disproportionate responses across different target vegetable crops, weights are adjusted through a calibration algorithm. Calibration adjusts the sampling weights so that the expanded data will match planted acreage totals from the January Crop Production report. This ensures that the chemical data collected will accurately represent the chemical usage for all target vegetable crops for the entire target population.

Estimators: The VCUS utilizes direct expansions for all survey indications. Direct expansions are calculated by summing the reported or imputed chemical data values multiplied by the calibrated weights. Variance estimates are computed for all expansions.

Outliers: NASS conducts a review of outliers found in the chemical use data by reviewing application rates for all records for the same product and commodity combinations. The FO and HQ statisticians work together to get the data as accurate as possible. The FO statistician reviews outliers within their state, and the HQ statistician examines outliers across all states for the published categories. A determination is made as to whether an adjustment to the application data is required. Most outliers trace back to unique situations that do not exist in the target population as much as the survey weight would indicate.

Estimation: HQ statisticians execute a summary that generates state level and national level indications. Field Offices are responsible for performing a detailed review of their survey results and providing comments that justify their survey results. HQ statisticians conduct a final review of survey results from all states. Any irregularities revealed by the summary must be investigated and, if necessary, resolved. After final review, national level summary results are adopted as official national estimates except in cases where strong justification supports deviating from survey totals.

There are three main types of data that NASS estimates for these surveys - fertilizer application, pesticide application, and Integrated Pesticide Management (IPM) data. For the application data, NASS collects information about the commercial fertilizers and pesticides applied during the crop year. For fertilizer, these applications are collected as either actual pounds or percent analysis of Nitrogen (N), Phosphate (P), Potash (K), and Sulfur (S). For pesticides, these applications are collected at the product level, generally per application. These product level data are converted to pounds of active ingredient, summarized, and published. If the data are deemed too unreliable (if there are too few reports), they are suppressed from publication, along with any needed complementary suppression.

For both fertilizer and pesticide application data, NASS estimates Area Applied (percent acres treated), Number of Applications, Rate per Application (pounds of active ingredient per acre), Rate per Crop Year (number of applications multiplied by rate per application), and Total Amount Applied.

The standard deviation for each active ingredient is calculated to determine data distribution for each crop. Chemical distribution rates are given by active ingredient for the Percent of Acres Treated, Number of Applications, Rate per Application, and Rate per Crop Year. Rate Distribution tables include the median, the 10th and 90th percentiles, the mean, and the coefficient of variation (CV) for an active ingredient when at least 30 farm operators report applying it on the specified crop.

The IPM data are generally a series of yes/no questions pertaining to specific pest management practices. IPM data are collected for the entire operation. From these data, NASS releases the percent of operations using the practice as well as the percent of acreage. The percent of acreage assumes that, if the operation uses the practice on one acre, it is used on all acres. This also means that the IPM data are not crop specific; they are distributed across all vegetable acres.

Quality Metrics for Agricultural Chemical Usage

Purpose and Definitions: Under the guidance of the Statistical Policy Office of the Office of Management and Budget (OMB), the United States Department of Agriculture’s National Agricultural Statistics Service (NASS) provides data users with quality metrics for its published data series. The metrics tables below describe the performance data for the survey contributing to the publication. The accuracy of data products may be evaluated through sampling and non-sampling error. The measurement of error due to sampling in the current period is evaluated by the coefficient of variation for each estimated item. Non-sampling error is evaluated by response rates and the percent of the estimate from respondents.

Sample Size is the number of observations selected from the population that are used to be representative of the entire population.

Response rates measure the proportion of the sample that is represented by the responding units in the survey.

Coefficient of Variation provides a measure of the size for the standard error relative to the point estimate and is used to measure the precision of the results of a survey estimator.

Vegetable Chemical Distribution, Sample Size, and Response Rates – United States: 2010

State	Sample size		Response rate	
	2010		2010	
Arizona		38		81.6
California		662		64.4
Colorado		40		87.5
Florida		262		63.7
Georgia		159		73.0
Illinois		139		82.7
Michigan		386		78.2
Minnesota		284		87.7
New Jersey		168		79.2
New York		284		75.0
North Carolina		208		90.4
Ohio		234		81.6
Oregon		176		84.1
Pennsylvania		215		85.1
South Carolina		98		92.9
Tennessee		74		79.7
Texas		234		79.5
Washington		233		75.1
Wisconsin		299		88.3
United States		4,193		78.0

Asparagus: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Diuron	20	11	15	15
Glyphosate iso. salt	18	10	8	10
Metribuzin	33	4	20	19
Insecticides				
Carbaryl	31	22	27	44
Chlorpyrifos	29	10	7	8
Fungicides				
Chlorothalonil	32	14	10	11

Peppers, Bell: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Insecticides				
Acephate	156	107	12	109
Chlorantraniliprole	123	102	27	127
Lambda-cyhalothrin	121	58	14	71
Fungicides				
Azoxystrobin	110	54	18	59
Chlorothalonil	54	49	56	73
Copper hydroxide	61	62	27	75
Mancozeb	50	55	44	76
Maneb	18	45	14	37

Cabbage, Fresh: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Oxyfluorfen	49	5	43	42
Trifluralin	68	1	21	21
Insecticides				
Lambda-cyhalothrin	57	47	10	42
Fungicides				
Chlorothalonil	27	22	11	14

Carrots, Processing: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Linuron	135	20	69	70

Cucumbers, Fresh: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Clomazone	45	6	44	47
Ethalfuralin	40	(Z)	21	21
Insecticides				
Carbaryl	47	12	14	11
Endosulfan	111	60	12	58
Esfenvalerate	108	64	11	64
Fungicides				
Azoxystrobin	49	64	8	65
Chlorothalonil	24	33	17	25
Copper hydroxide	81	43	36	65
Cymoxanil	77	51	2	52
Famoxadone	77	52	2	52
Mancozeb	26	57	21	60
Propamocarb hydrochloride	46	18	15	23

(Z) Less than half of the unit shown.

Cucumbers, Pickles: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Clomazone	24	(Z)	30	30
Ethalfuralin	23	11	19	28
Fungicides				
Chlorothalonil	11	12	10	6
Cymoxanil	15	10	7	15
Famoxadone	15	10	7	15
Mancozeb	19	12	6	14
Propamocarb hydrochloride	9	5	7	8

(Z) Less than half of the unit shown.

Peas, Green, Processing: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Bentazon	17	7	5	11
Imazethapyr	17	1	2	3
Imazethapyr ammonium salt	26	4	7	10
MCPB	15	2	5	6
Pendimethalin	8	2	4	4
Insecticides				
Bifenthrin	29	9	6	14

Lettuce Head: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Pronamide	50	5	37	40
Insecticides				
Chlorantraniliprole	81	16	45	35
Imidacloprid	28	15	39	28
Lambda-cyhalothrin	25	38	4	35
Methomyl	91	39	30	9
Permethrin	58	67	21	49
Spinetoram-J	31	34	15	48
Spinetoram-L	31	34	15	48
Spirotetramat	129	21	10	29
Zeta-cypermethrin	50	35	26	27
Fungicides				
Dimethomorph	179	22	8	29
Mandipropamide Technical	51	13	3	13
Maneb	21	20	22	13

Lettuce Other: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Bensulide	61	17	26	21
Insecticides				
Imidacloprid	48	30	75	76
Lambda-cyhalothrin	52	58	5	56
Methomyl	119	28	24	8
Permethrin	56	52	18	69
Spinetoram-J	44	42	10	37
Spinetoram-L	44	42	10	37
Spirotetramat	65	19	2	18
Zeta-cypermethrin	45	11	5	15
Fungicides				
Dimethomorph	51	7	1	6
Fenamidone	70	43	5	42
Mandipropamide Technical	41	26	2	25
Maneb	42	38	12	42

Onions: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Bromoxynil	38	9	35	33
Bromoxynil heptanoate	35	8	10	12
Bromoxynil octanoate	24	28	26	9
Clethodim	34	10	6	14
Dimethenamide-P	32	7	11	14
Fluazifop-P-butyl	38	12	9	17
Oxyfluorfen	18	22	23	12
Pendimethalin	17	13	8	8
Insecticides				
Chlorpyrifos	15	16	9	10
Diazinon	42	11	19	22
Lambda-cyhalothrin	51	15	7	13
Methomyl	30	14	9	22
Oxamyl	33	17	4	17
Spinetoram-J	17	6	17	15
Spinetoram-L	17	6	17	15
Fungicides				
Boscalid	29	6	49	48
Chlorothalonil	20	14	8	14
Copper hydroxide	14	18	23	16
Iprodione	29	24	5	25
Mancozeb	12	11	16	13
Mefenoxam	35	16	35	37
Pyraclostrobin	29	5	32	30

Pumpkins: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Clomazone	26	1	6	6
Ethalfuralin	27	1	13	13
Glyphosate iso. salt	67	14	16	18
Halosulfuron	33	2	8	8
S-Metolachlor	19	1	16	16
Insecticides				
Carbaryl	31	21	10	27
Endosulfan	38	28	14	35
Esfenvalerate	64	52	6	56
Imidacloprid	54	24	91	73
Lambda-cyhalothrin	65	41	14	32
Permethrin	57	32	31	58
Fungicides				
Azoxystrobin	33	8	6	9
Boscalid	38	28	27	40
Chlorothalonil	31	10	6	13
Copper hydroxide	37	16	17	27
Cyazofamid	58	35	2	36
Cymoxanil	53	14	6	10
Famoxadone	54	14	6	9
Mancozeb	67	9	20	27
Myclobutanil	46	10	12	16
Propamocarb hydrochloride	75	13	5	17
Pyraclostrobin	31	25	31	50
Quinoline	38	26	5	30
Triflumizole	58	13	6	14

Beans, Snap, Fresh: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
S-Metolachlor	50	(Z)	35	35
Insecticides				
Acephate	65	55	40	21
Esfenvalerate	89	15	13	28
Fungicides				
Chlorothalonil	58	33	26	35

(Z) Less than half of the unit shown.

Beans, Snap, Processing: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Bentazon	12	2	7	8
EPTC	15	2	2	3
Fomesafen	19	2	9	7
Halosulfuron	50	2	4	5
Imazamox	29	(Z)	6	6
Imazethapyr ammonium salt	80	2	2	3
Pendimethalin	48	2	8	9
S-Metolachlor	18	5	17	22
Sethoxydim	25	3	17	17
Trifluralin	19	3	6	4
Insecticides				
Acephate	36	5	4	6
Bifenthrin	17	10	5	14
Esfenvalerate	16	3	8	9
Fungicides				
Boscalid	27	1	9	9
Copper hydroxide	31	5	5	7
Iprodione	6	3	3	3
Thiophanate-methyl	13	13	4	11

(Z) Less than half of the unit shown.

Squash: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Clomazone	47	2	37	38
Ethalfuralin	29	1	18	18
Halosulfuron	85	25	13	35
Insecticides				
Bifenthrin	92	67	15	77
Carbaryl	81	36	27	46
Endosulfan	115	72	25	51
Esfenvalerate	57	51	13	53
Imidacloprid	103	83	71	39
Lambda-cyhalothrin	98	56	60	37
Permethrin	63	36	14	43
Fungicides				
Azoxystrobin	98	25	7	27
Chlorothalonil	28	33	26	55
Copper hydroxide	51	26	27	44
Cymoxanil	80	95	3	95
Famoxadone	80	96	3	96
Mancozeb	81	44	36	69
Myclobutanil	83	43	38	31
Propamocarb hydrochloride	81	22	16	33
Pyraclostrobin	71	118	126	35

Strawberries: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Insecticides				
Abamectin	27	42	25	46
Acetamiprid	43	44	8	41
Bifenazate	21	9	5	11
Bifenthrin	20	32	30	33
Malathion	28	38	32	43
Naled	23	23	15	14
Spinetoram-J	58	16	75	64
Spinetoram-L	58	16	5	16
Fungicides				
Boscalid	23	9	5	10
Captan	13	21	12	21
Cyprodinil	23	35	7	39
Fenhexamid	20	38	20	22
Fludioxonil	23	35	7	39
Myclobutanil	21	24	9	31
Pyraclostrobin	19	15	65	55
Pyrimethanil	31	23	27	48
Sulfur	24	19	26	40
Thiophanate-methyl	39	44	44	13
Thiram	23	22	10	22
Other Chemicals				
Chloropicrin	22	10	8	13

Sweet Corn, Fresh: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Alachlor	54	0	17	17
Atrazine	28	5	7	8
Bentazon	34	5	9	10
Glyphosate iso. salt	73	37	19	50
Mesotrione	25	23	20	25
Pendimethalin	64	22	21	19
S-Metolachlor	32	5	13	15
Topramezone	79	(Z)	16	16
Insecticides				
Bifenthrin	59	39	27	48
Carbaryl	17	6	7	8
Chlorpyrifos	33	24	24	30
Cyfluthrin	32	53	40	25
Esfenvalerate	66	35	13	37
Lambda-cyhalothrin	25	38	5	37
Methomyl	9	35	10	39
Permethrin	25	16	21	23
Thiodicarb	13	36	9	29
Zeta-cypermethrin	43	90	44	58
Fungicides				
Propiconazole	49	38	13	33

(Z) Less than half of the unit shown.

Sweet Corn, Processing: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Acetochlor	33	3	7	8
Atrazine	5	5	4	8
Dimethenamid-P	38	1	4	5
Mesotrione	37	2	19	19
S-Metolachlor	13	3	6	6
Tembotrione	17	1	2	2
Topramezone	27	3	3	5
Insecticides				
Bifenthrin	6	6	2	5
Lambda-cyhalothrin	17	18	10	17
Fungicides				
Azoxystrobin	19	7	5	9
Propiconazole	22	3	3	5
Tebuconazole	22	7	2	8

Tomatoes, Fresh: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Metribuzin	31	14	23	29
Paraquat	40	24	24	19
S-Metolachlor	29	3	10	12
Insecticides				
Bifenthrin	57	55	41	85
Carbaryl	96	51	61	64
Chlorantraniliprole	22	26	94	110
Dimethoate	37	45	9	52
Endosulfan	29	37	23	29
Esfenvalerate	28	45	14	56
Imidacloprid	25	12	13	11
Lambda-cyhalothrin	69	22	18	20
Methomyl	32	25	17	24
Spinetoram-J	31	43	8	49
Spinetoram-L	31	43	8	49
Fungicides				
Azoxystrobin	23	41	9	44
Chlorothalonil	15	23	16	14
Copper hydroxide	11	32	19	27
Cymoxanil	35	27	20	26
Famoxadone	35	28	18	23
Mancozeb	14	26	15	25
Pyraclostrobin	41	23	39	38

Tomatoes, Processing: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Glyphosate iso. salt	41	19	2	20
Rimsulfuron	78	61	11	71
S-Metolachlor	39	28	4	28
Trifluralin	36	27	8	21
Insecticides				
Dimethoate	38	70	3	71
Fungicides				
Chlorothalonil	44	35	2	34
Copper hydroxide	24	41	38	29
Myclobutanil	20	53	(Z)	53
Sulfur	35	22	9	27

(Z) Less than half of the unit shown.

Watermelons: Agricultural Chemical Distribution Table – Program States: 2010

Active ingredient	Percent of acres treated	Number of applications	Rate per application	Rate per crop year
	(CV percent)	(CV percent)	(CV percent)	(CV percent)
Herbicides				
Ethalfuralin	24	9	19	11
Glyphosate iso. salt	38	29	25	30
Insecticides				
Esfenvalerate	75	42	12	51
Fungicides				
Azoxystrobin	34	51	12	51
Boscalid	31	18	10	23
Chlorothalonil	10	6	5	9
Copper hydroxide	31	35	16	48
Mancozeb	12	16	16	12
Pyraclostrobin	26	14	36	34
Tebuconazole	22	35	36	33

Information Contacts

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Data Collection	Program Administration Branch.....	(202) 690-8747	HQ_CSD_PAB@nass.usda.gov
Questionnaires and Editing	Editing and Questionnaire Branch.....	(202) 720-6201	HQ_CSD_DCB@nass.usda.gov
Sampling	Survey Sampling Branch	(202) 720-3895	HQ_CSD_SB@nass.usda.gov
Analysis and Estimators	Statistical Methods Branch	(202) 720-4008	HQ_SD_SMB@nass.usda.gov
Dissemination and Webmaster	Data Dissemination Section.....	(202) 720-7017	HQ_DAPP_MISO@nass.usda.gov
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