

Agricultural Chemical Usage

The 2007 Field Crop Chemical Usage Report contains statistics for on-farm use of commercial fertilizers, agricultural chemicals, and pest management practices by apple producers in Michigan and six other major apple producing States.

The agricultural chemical use estimates in the report focus on bearing apple acreage treated with herbicides, insecticides, fungicides, and other pesticides. Information in this report is collected from a survey compiled from the Agricultural Resources Management Survey (ARMS). The ARMS survey is conducted in cooperation with the Economic Research Service (ERS). The information from the ARMS survey enables NASS to publish chemical use statistics and to provide ERS the ability to conduct economic analyses relating to field crop chemical usage.

The 2006 Nursery and Floriculture Chemical Usage Report is the third chemical use report based on chemical applications to nursery and floriculture crops in six major States. The survey was conducted for nursery and floriculture chemical applications made during calendar year 2006. All results refer to pesticide and integrated pest management (IPM) practices at nursery and floriculture operations.

The common name and trade name for the active ingredients in the tables can be found on page 95 of the Agricultural Chemical Usage 2007 Field Crops Summary publication which was released on May 21, 2008 or on page 231 of the Agricultural Chemical Usage 2006 Nursery and Floriculture Summary publication which was released on December 19, 2007.

Apples: Agricultural chemical applications, 2007¹

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per acre</i>	<i>Pounds per acre</i>	<i>1,000 lbs</i>
Herbicides					
2,4-D, dimeth. salt	19	1.2	0.895	1.079	7.4
Diuron	11	1.0	1.584	1.659	6.6
Glyphosate iso. salt	42	1.2	1.067	1.252	18.3
Paraquat	7	1.1	0.751	0.854	2.0
Pendimethalin	7	1.3	2.180	2.797	6.6
Simazine	8	1.1	2.164	2.366	6.7
Terbacil	4	1.0	0.504	0.504	0.7
Insecticides					
Abamectin	11	1.1	0.011	0.013	(²)
Acetamiprid	22	1.5	0.182	0.279	2.2
Azinphos-methyl	86	2.7	0.803	2.194	65.8
Benzoic acid	18	1.4	0.193	0.267	1.7
Bt subsp. kurstaki	3	1.0	(³)	(³)	(³)
Carbaryl	47	1.2	0.970	1.128	18.4
Chlorpyrifos	65	1.4	1.141	1.648	37.5
Cyd-X Granulo. Virus	14	2.1	(³)	(³)	(³)
Cyfluthrin	2	1.0	0.035	0.035	(²)
Emamectin benzoate	23	1.5	0.014	0.021	0.2
Esfenvalerate	39	1.4	0.035	0.048	0.7
Etoxazole	4	1.1	0.092	0.097	0.1
Fenpropathrin	12	1.3	0.277	0.353	1.5
Fenpyroximate	16	1.0	0.096	0.096	0.5
Gamma-cyhalothrin	4	1.9	0.020	0.037	0.1
Imidacloprid	25	1.6	0.073	0.113	1.0
Lambda-cyhalothrin	8	1.1	0.027	0.029	0.1
Methomyl	15	1.5	0.755	1.124	5.9
Novaluron	41	1.5	0.137	0.210	3.0
Permethrin	8	1.3	0.177	0.236	0.6
Petroleum distillate	8	1.5	17.203	25.179	73.3
Petroleum oil	6	1.0	6.928	6.933	13.6
Phosmet	46	2.4	1.551	3.766	60.4
Pyridaben	13	1.0	0.294	0.294	1.4
Spinosad	4	2.2	0.081	0.182	0.2
Thiacloprid	29	1.5	0.173	0.267	2.7

See footnote(s) at end of table.

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Apples: Agricultural chemical applications, 2007¹ (continued)

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per acre</i>	<i>Pounds per acre</i>	<i>1,000 lbs</i>
Fungicides					
Bacillus subtilis	5	1.4	(³)	(³)	(³)
Basic copper sulfate	6	1.1	0.838	0.901	1.9
Calcium polysulfide	2	1.3	6.547	8.825	5.7
Captan	93	4.7	2.171	10.262	332.6
Copper hydroxide	11	1.4	2.027	2.750	10.8
Copper oxychlo. sul.	7	1.1	2.031	2.229	5.3
Copper oxychloride	4	1.1	2.253	2.497	3.5
Copper sulfate	7	1.7	0.746	1.267	3.1
Cyprodinil	12	1.3	0.166	0.216	0.9
Fenarimol	5	2.2	0.044	0.096	0.2
Kresoxim-methyl	26	1.7	0.124	0.208	1.9
Mancozeb	77	3.2	3.224	10.263	276.7
Metiram	20	2.7	3.209	8.762	59.9
Myclobutanil	28	2.1	0.110	0.234	2.3
Oxytetracycline	2	1.5	0.232	0.352	0.3
Pyrimethanil	13	1.4	0.290	0.415	1.9
Streptomycin	25	1.5	0.225	0.328	2.8
Streptomycin sulfate	7	2.3	0.293	0.669	1.5
Sulfur	15	3.9	4.512	17.781	92.9
Thiophanate-methyl	18	2.6	0.324	0.837	5.2
Triadimefon	13	1.9	0.061	0.117	0.5
Trifloxystrobin	43	1.9	0.060	0.113	1.7
Ziram	27	2.1	2.877	6.092	58.6
Other chemicals					
Benzyladenine	16	1.2	0.062	0.072	0.4
Gibberellic acid	3	1.6	0.047	0.074	0.1
Gibberellins A4A7	2	1.3	0.010	0.014	(²)
NAA, Potassium salt	3	1.2	0.006	0.007	(²)
NAA, Sodium	32	1.1	0.021	0.024	0.3
Prohexadione calcium	16	1.6	0.152	0.240	1.4
Spirodiclofen	32	1.0	0.217	0.227	2.5
Warfarin	4	1.0	0.006	0.006	(²)

¹ Bearing acres in 2007 were 35,000 acres.

² Total applied is less than 50 lbs.

³ Rates and total applied are not available because amounts of active ingredient are not comparable between products.

Fertilizer applications: Apples, 2007¹

Fertilizer	Symbol	Area applied	Applications	Rate per application	Rate per crop year	Total applied
		<i>Percent</i>	<i>Number</i>	<i>Pounds per acre</i>	<i>Pounds per acre</i>	<i>1,000 pounds</i>
Nitrogen	N	58	1.9	24	46	941.5
Phosphate	P ₂ O ₅	25	2.2	15	33	294.1
Potash	K ₂ O	51	1.9	33	63	1,122.6
Sulfur	S	6	1.8	10	18	36.1

¹ Bearing acres in 2007 were 35,000 acres.

All nursery: Percent of Michigan operations using an active ingredient and rate per acre in all program States, 2006¹

Active ingredient	Operations using active ingredient	Rate per acre
	<i>Percent</i>	<i>Pounds per acre</i>
Herbicides		
Atrazine	6	2.156
Flumioxazin	7	0.241
Glyphosate iso. salt	54	1.235
Hexazinone	7	0.863
Oryzalin	13	2.502
Oxflorfen	18	1.509
Simazine	15	1.485
Insecticides		
Acephate	8	0.902
Bifenthrin	9	0.057
Carbaryl	30	1.129
Chlorpyrifos	21	0.917
Cyfluthrin	13	0.040
Diflubenzuron	7	0.076
Imidacloprid	5	0.179
Malathion	7	1.275
Methomyl	6	0.739
Petroleum distillate	6	11.413
Phosmet	7	0.588
Fungicides		
Chlorothalonil	23	2.301
Mancozeb	7	0.957
Mefenoxam	5	0.524
Thiophanate-methyl	9	0.756

¹ Active ingredients excluded if used by less than 5 percent of operations. Program States: CA, FL, MI, OR, PA, and TX.

Christmas trees: Percent of Michigan operations using an active ingredient and rate per acre in all program States, 2006¹

Active ingredient	Operations using active ingredient	Rate per acre
	<i>Percent</i>	<i>Pounds per acre</i>
Herbicides		
Atrazine	13	2.451
Fluazifop-P-butyl	6	0.369
Flumioxazin	8	0.260
Glyphosate iso. salt	66	0.903
Hexazinone	14	0.828
Oxyfluorfen	12	0.566
Simazine	31	1.408
Insecticides		
Carbaryl	42	0.966
Chlorpyrifos	34	0.920
Cyfluthrin	17	0.049
Diflubenzuron	13	0.037
Malathion	5	1.187
Petroleum distillate	9	6.850
Fungicides		
Chlorothalonil	37	1.615

¹ Active ingredients excluded if used by less than 5 percent of operations. Program States: CA, FL, MI, OR, PA, and TX.

All floriculture: Percent of Michigan operations using an active ingredient and rate per acre in all program States, 2006¹

Active ingredient	Operations using active ingredient	Rate per acre
	<i>Percent</i>	<i>Pounds per acre</i>
Insecticides		
Abamectin	43	0.009
Acephate	42	0.708
Acetamiprid	9	0.201
Azadirachtin	12	0.030
Bifenazate	12	0.265
Bifenthrin	19	0.096
Carbaryl	6	1.154
Chlorpyrifos	14	0.581
Clothianidin	6	0.295
Cyfluthrin	11	0.202
Diflubenzuron	5	0.072
Endosulfan	9	0.717
Fenpropathrin	14	0.222
Fluvalinate	7	0.156
Imidacloprid	39	0.113
Methiocarb	5	0.943
Piperonyl butoxide	10	0.265
Potassium salts	5	3.284
Pymetrozine	13	0.158
Pyrethrins	9	0.016
Pyridaben	6	0.290
Pyridine	6	0.098
S-Kinoprene	7	0.493
Spinosad	29	0.105
Thiamethoxam	6	0.046
Fungicides		
Azoxystrobin	7	0.136
Butanone	6	0.145
Captan	5	1.384
Chlorothalonil	29	1.686
Copper sulfate	8	0.090
Etridiazole	25	3.590
Fenhexamid	13	0.476
Fludioxonil	11	0.877
Fosetyl-al	5	2.796
Iprodione	15	0.809
Mancozeb	7	1.464
Mefenoxam	23	0.394
PCNB	9	2.409
Thiophanate	27	0.568
Thiophanate-methyl	32	2.105
Trifloxystrobin	10	0.129
Other chemicals		
Ancymidol	6	0.003
Benzyladenine	5	0.033
Chlormequat chloride	17	1.753
Daminozide	30	3.020
Ethephon	19	0.577
Gibberellins A4A7	5	0.033
Hydrogen peroxide	6	1.470
Paclobutrazol	34	0.024
Uniconazole	16	0.012

¹ Active ingredients excluded if used by less than 5 percent of operations. Program States: CA, FL, MI, OR, PA, and TX.

Commercial fertilizer consumption: 2002-2006 ¹

Item	Year ending June 30				
	2002	2003	2004	2005	2006
	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>	<i>Short tons</i>
Primary plant nutrients					
Total N	240,680	238,296	264,850	253,433	232,710
N in multi-nutrients	55,048	60,449	60,405	57,559	58,308
Total P ₂ O ₅	84,734	85,485	94,352	82,885	85,746
P ₂ O ₅ in multi-nutrients	82,377	83,193	92,225	81,187	83,841
Total K ₂ O	189,200	189,463	210,479	189,432	163,523
K ₂ O in multi-nutrients	41,924	45,298	46,989	41,926	36,883
Total plant nutrients	514,615	513,243	569,680	525,751	481,979
Average analysis	43.1	40.1	41.1	37.7	41.3
Total nutrients in multi-nutrients	179,349	188,940	199,620	180,673	179,031
Selected single-nutrient materials					
Ammonium nitrate	5,405	7,856	6,619	7,501	5,168
Anhydrous ammonia	52,766	39,235	43,551	50,071	33,759
Nitrogen solutions	284,355	285,787	323,712	301,868	279,293
Urea	107,305	107,854	132,493	108,090	107,941
Ammonium sulfate	23,569	25,294	30,376	36,660	30,254
Concentrated superphosphate	4,984	4,515	4,139	3,716	4,189
Potassium chloride	236,720	231,668	259,011	234,700	203,398
Multiple-nutrient fertilizers					
N-P-K	334,670	265,924	294,691	227,081	245,713
N-P	129,900	133,062	142,136	134,719	143,185
N-K	27,096	34,853	33,024	44,437	56,456
P-K	3,831	2,828	3,129	2,926	2,536
Leading multiple-nutrient grades					
10-34-0	44,303	46,717	50,860	37,026	47,687
18-46-0	36,672	37,149	35,938	38,902	39,534
11-52-0	24,636	25,865	34,428	35,776	35,295
28-3-3	7,761	7,654	7,357	6,951	12,504
19-19-19	13,989	12,709	16,547	13,756	11,670
4-10-10	(²)	(²)	(²)	(²)	7,347
Fertilizer consumption by classes					
Dry bulk single-nutrient	392,966	443,887	472,774	430,495	380,147
Dry bagged single-nutrient	23,385	40,127	35,943	19,815	18,688
Fluid single-nutrient	339,295	343,115	373,002	362,722	319,143
Dry bulk multiple-nutrient	223,668	231,005	248,576	202,878	214,164
Dry bagged multiple-nutrient	187,396	132,037	150,598	137,291	145,636
Fluid multiple-nutrient	84,433	73,625	73,805	68,993	88,090
Organics, secondary and micronutrients	31,883	84,679	60,845	58,519	148,112
Total	1,283,026	1,348,475	1,415,544	1,280,715	1,313,980

¹ Source: The Association of American Plant Food Control Officials.

² Grade not published.