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Report Highlights:

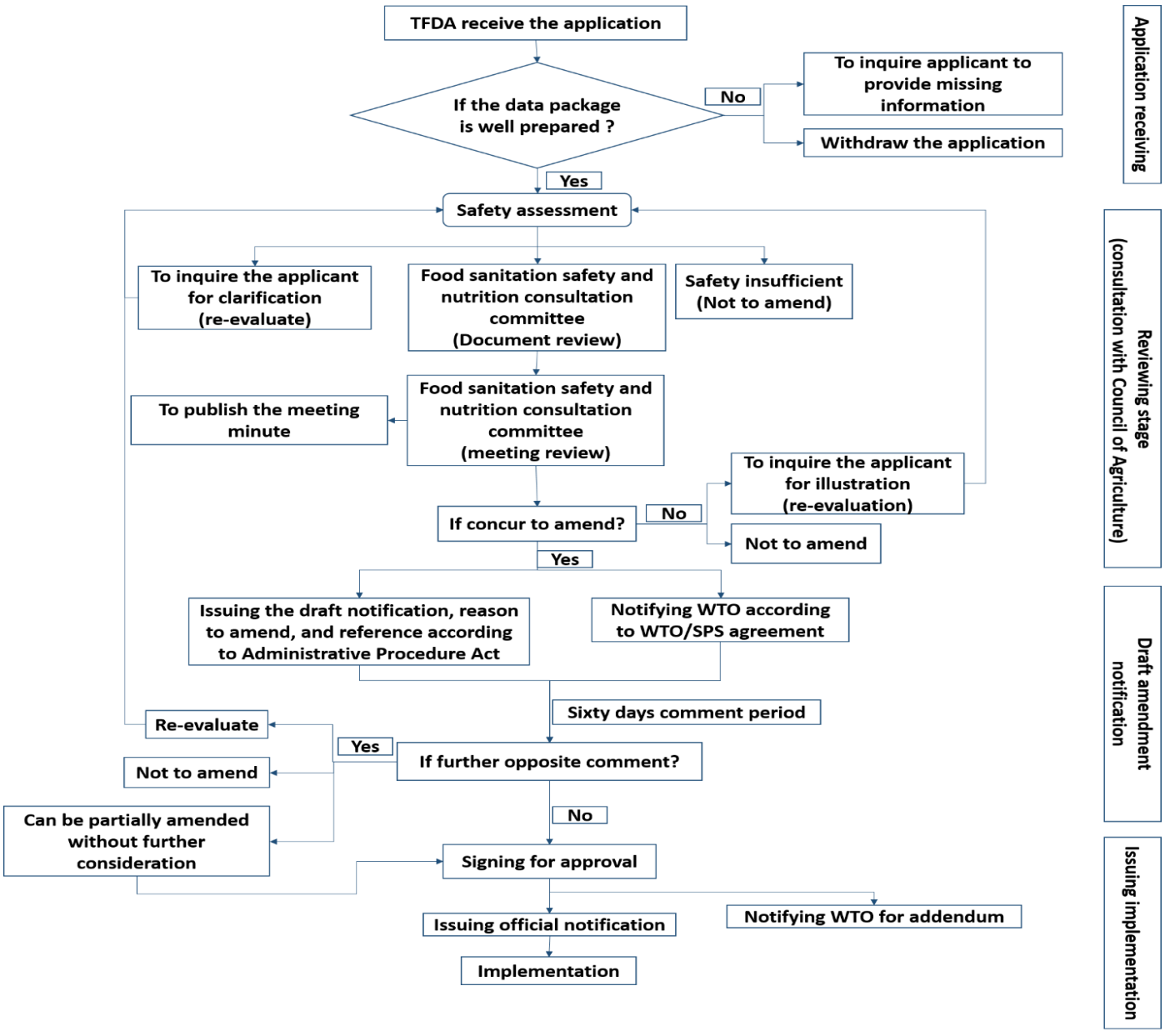
This report is a voluntary update to GAIN Report TW2020-0014, published February 25, 2020. The report provides a brief introduction to Taiwan's pesticide residue policy to include maximum residue limit (MRL) import tolerance applications, up-to-date MRL database, frequently used residue testing methods and recent MRL announcement history.

Import tolerance application

This report is an update to GAIN Report TW2020-0014, published Feb 25, 2020. In Taiwan, there are two authorities responsible for agriculture pesticide regulation. According to Act Governing Food Safety and Sanitation Article 15, the Ministry of Health and Welfare (MoHW) is responsible for maximum residue limit (MRL) standard and regulation; and according to Agro- pesticides Management Act, Council of Agriculture (COA) oversees registering pesticides for domestic use. Any MRLs set as part of a domestic registration are automatically extended to imports.

Taiwan does not automatically adopt MRLS established by CODEX as default standards. Taiwan's Food and Drug Administration (TFDA) accepts MRL applications from interested parties, including registrants, chemical companies, growers' groups, and the representative offices of exporting countries. If the data provided is deemed sufficient, TFDA will transfer the application directly to Taiwan Agriculture Chemicals and Toxic Substances Research Institute (TACTRI, under COA) to do a document review. If the data is not sufficient, TFDA will send notice to the applicant to provide missing information and resubmit. After a complete document review, TACTRI will give its suggested MRLs to the Food and Sanitation Safety and Nutrition Consultation Committee for further review. The committee can then agree to the suggested MRL or, if deemed necessary, amend the MRLs for approval. TFDA will then publish a local announcement and WTO notification. After those notifications TFDA will make implementation official (usually four months or so after the initial notifications). The entire process from submission to implementation can vary depending on the compound being considered but at least 18 months and on average 2 years or longer has been standard. TFDA has developed a status tracking system for MRL applicants and TFDA has indicated that it will update the system in 2022 to improve the systems transparency. Please check Appendix A for the requirements of establishing a pesticide tolerance. (2020.02 revised).

According to TACTRI data, there were 253 pesticide tolerance application waiting for document review in 2021. TACTRI completed 67 MRL reviews in 2021, 101 MRLs in 2020, and 96 MRLs in 2019. The meeting minutes of the Food and Sanitation Safety and Nutrition Consultation Committee is published online (in Chinese).



Flow Chart of Taiwan MRL application process

Up to date Taiwan MRL database

All food products should comply with Standards for Pesticide Residue Limits in Foods (2021.08.18 revised). Taiwan uses a positive MRL list. Any chemical not in the list is not allowed. Detailed information of the current MRL list is provided in the tables below. TFDA also establishes an online public searching database for pesticide MRLs (in Chinese). There are 7,435 MRL sets of chemical/ crop combination, 1 extraneous residue limit, 38 omitted chemicals/ biochemical products, and 62 prohibited chemicals (2022.2.16).

Name of table	Description and link
Table 1. Pesticide Residue limits in Foods (pdf)	The pesticide residues in foods except animal products shall meet the Standards for the Pesticides Residue Limits in foods Table and Extraneous Residue Limits Table, as Appendix Table 1 and Table 2. Pesticides not listed in the Table shall not be detected.
Table 2. Extraneous Residue Limits (pdf)	
Table 3. List of Pesticide MRLs Omitted (pdf)	Pesticides listed in the Appendix Table 3 are highly safe, it is not necessary to set the maximum residue limits and examine their residues.
Table 4. Pesticide Prohibited for Use (pdf)	No residue shall be detected for the pesticides prohibited for use by the agriculture authority, unless other regulations apply.
Table 5. Classification of crops for pesticide Residue Limit in Foods (pdf)	The classification of crops referred in the Standards for pesticide residue limits in foods.

MRL testing for food

Method of Test for Pesticide Residue in Foods – Multiresidue Analysis (5)(pdf) is the official testing protocol which is most frequently used in border inspection. This method is applicable for the determination of 380 pesticide residues in fruit, vegetable, crops, dried beans, tea, spice plants and other herbs. (See 380 pesticides in Appendix B). After preparation of the sample solution by QuEChERs (Quick, Easy, Cheap, Effective, Rugged, Safe) [1], pesticide is determined by LC- MS/MS or GC- MS/MS[2], which the sensitivity and specificity are high. Limit of Quantification (LOQ) for each pesticide is listed in the protocol. Detection below LOQ will be considered as non-detection. Most of LOQ for fruit, crop, and tea is 0.01, 0.02, 0.05 ppm, respectively. The testing laboratory must have the GLP (Global Laboratory Practice) certificate.

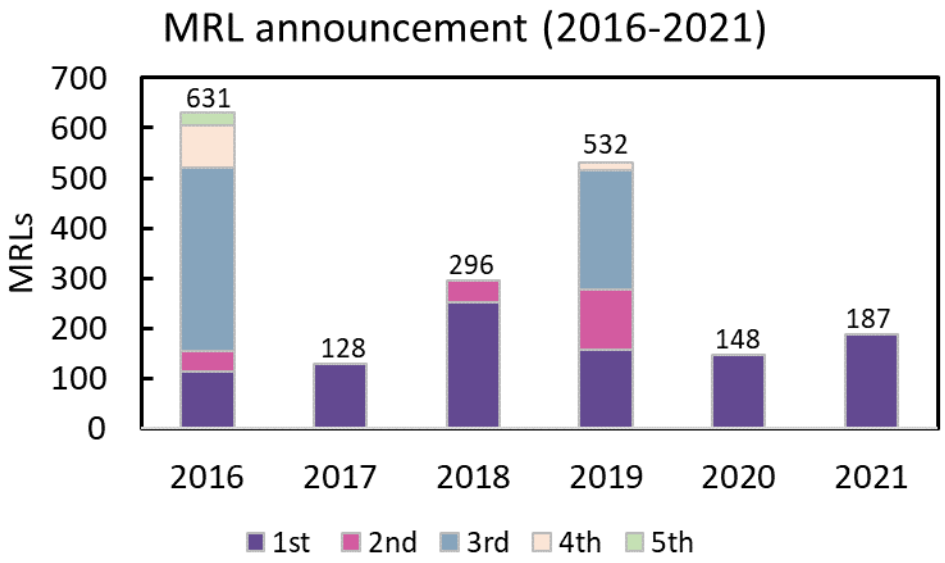
LOQ (ppm)		
Fruit And Vegetable	Crop	Tea
Fruit and vegetable (fresh), spice plants and other herbs (fresh)	Crops and dried beans	Teas, fruits and vegetables (dried), spice plants and other herbs (dried)

In addition, there are two other testing methods for pesticide detection which are also often applied in border inspection. One is Method of Test for Pesticide Residues in Foods – Multiresidue Analysis (6) (2021.12.30) for 20 pesticides residues. This method is similar to multiresidue analysis (5) but with several testing condition adjustments; another one is Method of Test for Pesticide Residues in Foods – Multiresidue Analysis of Polar Pesticides and their Metabolites (2021.09.11 revised, in Chinese) for testing polar pesticide in grain and dry beans. This method does not use QuEChERs for sample solution and they use LC- MS/MS for final detection and analysis.

[1] *QuEChERs is an extraction method developed by Steven J. Lehotay, a chemist from USDA ARS.*
[2] *LC- MS/MS: Liquid chromatography/ tandem mass spectrometry; GC- MS/MS: Gas chromatography/ tandem mass spectrometry*

MRL announcement history

TFDA does not have a set announcement schedule for MRLs and the time and number of each announcement can vary. From 2016 to 2021, Taiwan announced a total of 14 MRL amendments with 1,922 newly announced MRLs.



MRL Amendment/ Revocation history

	Amendment	Revocation
2022.02.09 (pre-notice)		32 MRLs/ 1 chemical
2021.08.18	187 MRLs/ 43 chemicals	
2020.05.20	148 MRLs/ 40 chemicals	
2019.11.06	16 MRLs/ 10 chemicals	
2019.08.02	238 MRLs/ 34 chemicals	
2019.06.18	122 MRLs/ 32 chemicals	4 MRLs/ 2 chemicals
2019.01.28	156 MRLs/ 19 chemicals	4 MRLs/ 2chemicals
2018.09.12	43 MRLs/ 10 chemicals	
2018.06.27		21 MRLs/ 2 chemicals
2018.01.16	253 MRLs/ 29 chemicals	
2017.06.29		1 MRL / 1 chemical
2017.03.15	128 MRLs/ 22 chemicals	
2016.12.12	25 MRLs/ 8 chemicals	
2016.10.26	85 MRLs/ 14 chemicals	
2016.07.14	367 MRLs/ 59 chemicals	
2016.05.09	40 MRLs/ 6 chemicals	
2016.03.18	114 MRLs/ 32 chemicals	11 MRLs / 2 chemicals

Appendix A:

Requirement for Establishing the Tolerance of Pesticide Residue on Crops (2020.02 revised)

1. Applicant
2. Common name
3. Commercial name or code
4. Chemical name (IUPAC)
5. Chemical Abstracts Service (CAS) Number
6. Chemical class
7. Functional class: □Insecticide □Fungicide □Herbicide □Others
8. End-product name, content (%), and any risk impurity
9. Commercialized countries
10. Registered use (GAP)
11. Physical & chemical characteristics (GLP) [3](not required only for domestic registered pesticide)
(1) Active ingredient: common name, chemical name (IUPAC), Chemical Abstracts Service (CAS) Number, chemical formula, molecular weight.
(2) Technical grade: appearance, odor, melting point or boiling point, density or specific gravity, pH value, vapor pressure, octanol/water partition coefficient, dissociation constant, solubility in water, solubility in other solvents.
(3) Composition of technical-grade (5 batches report), Manufacturing process and discussion of impurities formation.
(4) Formulation and its composition of end-product
12. Toxicology data (Not required only for domestic registered pesticide)
(1) Acute oral toxicity
(2) Subchronic toxicity tests (at least 2 animals)
(3) Chronic feeding toxicity study and oncogenicity study (at least 2 animals for each study)
(4) Reproductive study-2 generation
(5) Teratogenicity study (at least 2 animals)
(6) Mutagenicity tests (Test items including bacteria, cell and *in vivo* tests)
13. Metabolism in animal
14. Metabolism in plant
15. Analytical methods
(1) Crop
(2) Target
(3) Abstract of analytical methods
(4) Apparatus
(5) Recovery
(6) Limitation of detection
16. Residue trial data (GLP) (submitted in accordance with the applied crops). Field trial numbers depend on applied crops. More than 3 trial data shall be submitted for domestic major crops [4]; other minor crops at

[3] The GLP test facilities shall be of the OECD members or the OECD Mutual Acceptance of Data (MAD) system participants, the data can also be issued by the test facilities supervised by the countries with agreement on mutual acceptance of data with Taiwan.
[4] Major crops in Taiwan are including paddy rice, wheat, corn, small red bean (adzuki), peanut, pak-choi, vegetable soybean (edamame), cabbage, sweet potato (including leaf), bamboo shoot, watermelon, taro, celery, cauliflower, melon, onion, cucumber, carrot, bitter melon, eggplant, Chinese chive, cantaloupe, mushroom, strawberry, potato, co-ba, tomato,

least submit 1 trial data.

17. International banned and restricted data, MRLs and ADI of applied pesticide

Chinese cabbage, lettuce, garlic, green onion, ginger, water spinach, radish, pumpkin, sesame, golden mushroom, pepper (including sweet pepper and hot pepper), pomelo, papaya, plum, mango, loquat, persimmon, orange, banana, peach, litchi, tankan mandarin, Chinese plum (Prunus mume), pear, Indian jujube, guava, sweet sop (including atemoya), ponkan mandarin, coconut, grape, pineapple, wax apple, longan, pitaya, lemon, tea, sugarcane, lily, rose, chrysanthemum, and orchid etc.

Appendix B:

380 Pesticide in Multiresidue Analysis (5)

A: Abamectin, Acephate, Acetamiprid, Acibenzolar-S-methyl, Aldicarb, Aldicarb sulfone, Aldicarb sulfoxide, Alloxydim (sodium), Ametoctradin, Ametryn, Amisulbrom, Atrazine, Azoxystrobin, Acequinocyl - hydroxyl, Acetochlor, Acrinathrin, Alachlor, Aldrin, Allethrin, Azinphos-methyl

B: Benalaxyl, Bendiocarb, Benfuracarb, Bensulfuron-methyl, Benthiazole, Benzovindiflupyr, Bifenazate, Boscalid, Bufencarb, Buprofezin, Butafenacil, Butocarboxim, Bentazone, Benfluralin, α-BHC, β-BHC, γ-BHC (Lindane), δ-BHC, Bifenox, Bifenthrin, Bitertanol, Bromacil, Bromophos-ethyl, Bromophos, Bromopropylate, Bromuconazole, Bupirimate, Butachlor, Butralin,

C: Carbaryl, Carbendazim, Carbofuran, 3-keto Carbofuran, 3-OH Carbofuran, Carbosulfan, Carfentrazone-ethyl, Carpropamid, Chlorantraniliprole, Chlorfluazuron, Chromafenozide, Cinosulfuron, Clethodim, Clofentezine, Clomazone, Clomeprop, Clothianidin, Cyanazine, Cyantraniliprole, Cyazofamid, Cyclosulfamuron, Cycloxydim, Cyenopyrafen, Cyflufenamid, Cyflumetofen, Cymoxanil, Cyprodinil, Cadusafos, Carbophenothion, Chinomethionat, cis-Chlordane, trans-Chlordane, Chlorfenapyr, Chloropropylate, Chlorothalonil, Chlorpropham, Chlorpyrifos, Chlorpyrifos-methyl, Chlorthal-dimethyl, Chlozolinate, CPMC (Etrofol), Cyanofenphos, Cyanophos, Cyfluthrin, Cyhalofop-butyl, λ-Cyhalothrin, Cypermethrin, α-cypermethrin, Cyproconazole

D: Demeton-S-methyl, Dicrotophos, Dimethenamid, Dimethoate, Dimethomorph, Dinotefuran, Diuron, Dymron, Diflubenzuron, o,p'-DDD, o,p'-DDE, o,p'-DDT, p,p'-DDE, p,p'-DDT, p,p'-DDD, Deltamethrin, Diazinon, Dichlorvos, Dicloran, Dicofol (DCBP), Dieldrin, Difenoconazole, 2,6-Diisopropylnaphthalene, 2,6-DIPN, 2,6-Diisopropylnaphthalene (2,6-DIPN), Dimethipin, Diniconazole, Dinitramine, Diphenamid, Diphenylamine, Disulfoton, Ditalimfos, Dithiopyr

E: Emamectin benzoate B1a, Emamectin benzoate B1b, Ethiprole, Ethirimol, Etoxazole, Edifenphos, α-Endosulfan, β-Endosulfan, Endosulfan-sulfate, Endrin, EPN, Epoxiconazole, Esfenvalerate, Ethion, Ethoprophos, Etofenprox, Etridiazole, Etrimfos

F: Famoxadone, Fenamiphos, Fenazaquin, Fenbutatin-oxide, Fenhexamid, Fenobucarb, Fenothiocarb, Fenoxanil, Fenoxycarb, Fenpyrazamine, Fenpyroximate, Fenthion, Ferimzone, Flazasulfuron, Flonicamid, Fluazifop-P-butyl, Fludioxonil, Flufenoxuron, Fluopicolide, Fluopyram, Flupyradifurone, Flusilazole, Flutriafol, Formetanate, Fosthiazate, Furametpyr, Fipronil, Fipronil-sulfone, Fluazinam, Flubendiamide, Fenarimol, Fenbuconazole, Fenitrothion, Fenoxaprop-ethyl, Fenpropathrin, Fenpropimorph, Fensulfothion, Fenvalerate, Flucythrinate, Fluensulfone, Fluroxypyr-meptyl, Flutolanil, Fluvalinate, Fluxapyroxad, Fonofos, Formothion, Fthalide

H: Haloxyfop-methyl, Hexaconazole, Hexaflumuron , Hexythiazox, Halfenprox, Heptachlor, Heptachlor epoxide, Heptenophos, Hexazinone

I: Imazalil, Imidacloprid, Indoxacarb, Iprovalicarb, Isazofos, Isoprocarb, Isopyrazam, Isouron, Isoxaflutole, Imibenconazole, Iprobenfos, Iprodione, Isofenphos, Isoprothiolane, Isotianil, Isoxathion

K: Kresoxim-methyl

L: Linuron, Lufenuron

M: Mandipropamid, Mecarbam, Mepanipyrim, Metaflumizone, Metalaxyl, Metconazole, Methamidophos, Methiocarb, Methomyl, Methoprene, Methoxyfenozide, Metobromuron, Metolcarb, Metrafenone, Metribuzin, Mevinphos, Monocrotophos, MPMC (Xylylcarb) , Malathion, Mefenacet, Mephosfolan, Mepronil, Metazachlor, Methacrifos, Methidathion, Methyl pentachlorophenyl sulfide, Metolachlor, Mirex, Molinate, Myclobutanil

N: Nitenpyram, Norflurazon, Novaluron, Napropamide, Nuarimol

O: Omethoate, Oxamyl, Oxycarboxin, Oxydemeton-Methyl, Oxadiazon, Oxadixyl, Oxyfluorfen

P: Pencycuron, Penoxsulam, Phosphamidon, Phoxim, Piperonyl butoxide, Pirimicarb, Pretilachlor, Probenazole, Prochloraz, Profenophos, Promecarb, Propamocarb hydrochloride, Propanil, Propargite, Propoxur, Proquinazid, Pymetrozine, Pyracarbolid, Pyraclostrobin, Pyrazosulfuron-ethyl, Pyrethrins, (Pyrethrin I, Pyrethrin II, Cinerin I, Cinerin II, Jasmolin I , Jasmolin II), Pyribencarb, Pyridaben, Pyrifluquinazon, Pyridate, Pyri fenox, Penthiopyrad, Paclobutrazol, Parathion, Parathion-methyl, Penconazole, Pendimethalin, Penflufen, Pentachloroaniline, Permethrin, Phenothiol, Phenothrin, Phenthoate, 2-Phenylphenol, Phorate, Phosalone, Phosmet, Pirimiphos-ethyl, Pirimiphos-methyl, Procymidone, Prometryn, Propaphos, Propiconazole, Prothiofos, Pyraclofos, Pyraflufen-ethyl, Pyrazophos, Pyridaphenthion, Pyrimethanil, Pyrimidifen, Pyriproxyfen, Pyroquilon

Q: Quinoxyfen, Quizalofop-ethyl, Quinalphos, Quintozene (PCNB)

R: Rotenone

S: Saflufenacil, Sethoxydim, Simazine, Spinetoram J, Spinetoram L, Spinosad A (spinosyn A), Spinosad D (spinosyn D), Spirodiclofen, Spiromesifen , Spirotetramat, Sulfoxaflor Salithion, Sedaxane, Silafluofen

T: Tebufenozide, Tebufenpyrad, Tepraloxydim, Thiabendazole, Thiacloprid, Thiamethoxam, Thiobencarb, Thiodicarb, Thiofanox, Tolfenpyrad, Tolyfluanid, Trichlorfon, Tricyclazole, Trifloxystrobin, Triforine, Teflubenzuron, Tebuconazole, Terbufos, Tetraconazole, Tetradifon, Tetramethrin, Thenylchlor, Thifluzamide, Thiometon, Tolclofos-methyl, Triadimefon, Triadimenol, Triazophos, Tridiphane, Triflumizole, Trifluralin

V: Vamidothion, Vinclozolin

X: XMC (Macbal)

Z: Zoxamide

Attachments:

No Attachments.