

Preventing Crop Protection Agent Residue Problems in Tobacco

*Eric Walker, Assistant Professor and Extension Tobacco Specialist,
University of Tennessee and University of Kentucky*

Ryan Brown, Graduate Research Assistant, University of Tennessee

Joe Beeler, Tobacco Research Associate, University of Tennessee

Darrell Hensley, Extension Plant Pathology and IPM Specialist, University of Tennessee

Significant changes in tobacco production have occurred over the last 20 years. While some changes have been positive, many have been challenging, discouraging, and, at times, confusing. One such change is the increased emphasis placed on minimizing crop protection agent (CPA) residues.

Crop protection agents include herbicides, insecticides, fungicides, sucker control agents and other products applied to the tobacco during the season (Table 1). As with any crop, only pesticides labeled for use in tobacco are permitted. Use of any product that does not expressly list tobacco on its label is not only forbidden, but also illegal according to federal law. Additionally, use of a labeled pesticide in a manner not expressly stated in the label or at rates exceeding the labeled rates is also forbidden and illegal. Similarly, application of a labeled CPA — even at the labeled rate — but followed by harvest before the spray-to-harvest or pre-harvest interval (PHI) is prohibited and may inflate CPA residues. These “off-label” applications have been and continue to be problems for the US tobacco industry and threaten its sustainability and the sustainability of tobacco producers.

When residues of a CPA not labeled in tobacco are detected, the tobacco is no longer marketable and must be destroyed. Not only does this cause loss for the tobacco producer and buyer, but it also jeopardizes the contract of the producer and the reputations of the tobacco producers, buyers, dealers and manufacturers. The detection of CPA residues of labeled products may also cause problems. In recent years, some tobacco leaf customers have expressed concerns about the presence of residues of CPAs labeled for tobacco — normal levels of CPA residues that can occur when CPAs are used in strict accordance with their labels. Some of the customers’ concerns may not be related to perceived harm; rather, these concerns may be due simply to the desires of the customer or the end users for a residue-free product.

Because tobacco buyers must purchase tobacco that meets the requirements of their customers, tobacco producers and dealers must be aware of these requirements, accept them, and work together to deliver high-quality tobacco. Regular, open communication is of the utmost importance. Tobacco leaf buyers must communicate with their customers to determine customer requirements for the tobacco and then communicate the requirements to the producers. Producers must communicate with their buyers

throughout the season and adhere to their contracts. If a problem in the field arises that calls for an application of a CPA that is permitted by the label but is of concern to the buyer, the producer should contact the buyer to determine if there is an alternative CPA or other measure that protects not only the integrity of the tobacco in the field, but also its marketability. This issue becomes increasingly important as the season progresses.

US tobacco producers continue to produce the best tobacco in the world, but other nations are increasingly producing better tobacco. The gap is narrowing. Few crops in the United States face as many regulations and scrutiny as tobacco. In order to remain in the marketplace, buyers must rely on proven producers who deliver high-quality, worry-free tobacco with no or low CPA residues. Producers who comply with existing rules and adapt to new and changing rules, while continuing to deliver high-quality tobacco that meets CPA requirements, are most likely to continue producing tobacco in the future.

The increased emphasis placed on minimizing CPA residues pose a challenge for tobacco producers. The following table provides information on CPAs labeled in tobacco and includes information on application restrictions to help manage residue levels. Please contact your local Extension agent and specialists if you have questions, need information, or encounter production problems. Also, be mindful of your contract requirements and communicate regularly with your buyer to ensure that everyone's tobacco needs are being met.

Table 1. List of crop protection agents (CPAs) used in the production of tobacco

Trade Name	Type	Common Name	Company	RUP ¹	Signal Word	Days PHI ²	Hours REI ³
Agri-Mycin 17	bactericide	streptomycin sulfate	Nufarm Ag. Products	No	Caution	No restriction stated on label	12 hrs
Harbour	bactericide	streptomycin	ADAMA	No	Caution	No restriction stated on label	12 hrs
Actigard 50WG	plant activator/fungicide	acibenzolar-S-methyl aluminum tris (O-ethyl phosphate)	Syngenta Crop Protection LLC.	No	Danger	21 days	12 hrs
Aliette WDG	fungicide	dimethomorph	Bayer Crop Sciences	No	Caution	3 days	12 hrs
Forum	fungicide	mancozeb	BASF Ag. Products	No	Caution	0 days	12 hrs
Manzate Pro-Stick	fungicide	mancozeb	United Phosphorus Inc.	No	Caution	30 days	24 hrs
MetaStar 2E	fungicide	metalaxyl	LG Life Sciences	No	Warning	Not foliarly applied	48 hrs
Orondis Gold 200	fungicide	oxathiapirrolin	Syngenta Crop Protection LLC.	No	Caution	7 days	4 hrs
Orondis Ultra A	fungicide	oxathiapirrolin	Syngenta Crop Protection LLC.	No	Caution	7 days	4 hrs
Orondis Ultra B	fungicide	mandipropamid	Syngenta Crop Protection LLC.	No	None	7 days	4 hrs
Penncozeb 75 DF	fungicide	mancozeb	United Phosphorus Inc.	No	Caution	21 d in flue-cured tobacco	24 hrs
Presidio	fungicide	fluopicolide	Valent USA	No	Caution	7 days	12 hrs
Quadris 2.08	fungicide	azoxystrobin	Syngenta Crop Protection LLC.	No	Caution	0 days	4 hrs
Revus 2.08SC	fungicide	mandipropamid	Syngenta Crop Protection LLC.	No	Caution	7 days	4 hrs
Ridomil Gold SL	fungicide	mefenoxam	Syngenta Crop Protection LLC.	No	Warning	Not foliarly applied	48 hrs
Terramaster 4 EC	fungicide	etridiazole	Chemtura AgroSolution	No	Danger	Not foliarly applied	12 hrs
Ultra Flourish 2E	fungicide	mefenoxam	Nufarm Ag. Products	No	Warning	Not foliarly applied	48 hrs
Acumen	herbicide	pendimethalin	Tenkoz, Inc.	No	Caution	Not foliarly applied	24 hrs
Aim EC	herbicide	carfentrazone	FMC Corp.	No	Caution	Not foliarly applied to tobacco	12 hrs
Blanket	herbicide	sulfentrazone	Tenkoz, Inc.	No	Caution	Not foliarly applied	12 hrs
Command 3ME	herbicide	clomazone	FMC Corp.	No	Caution	Product not applied past 7 days after transplanting	12 hrs
Devrinol 2-XT	herbicide	napropamide	United Phosphorus Inc.	No	Caution	Not foliarly applied	24 hrs
Devrinol 50 DF	herbicide	napropamide	United Phosphorus Inc.	No	Caution	Not foliarly applied	24 hrs
Devrinol DF-XT	herbicide	napropamide	United Phosphorus Inc.	No	Caution	Not foliarly applied	24 hrs
Framework 3.3	herbicide	pendimethalin	Windfield Solution	No	Caution	Not foliarly applied	24 hrs
Gramoxone SL 2.0	herbicide	paraquat	Syngenta Crop Protection LLC.	Yes	Danger/Poison	Not foliarly applied to tobacco	24 hrs
Helena Pendimethalin	herbicide	pendimethalin	Helena Chemical Co.	No	Caution	Not foliarly applied	24 hrs
Helm Sulfentrazone 4F	herbicide	sulfentrazone	Helm Agro US, Inc.	No	Caution	Not foliarly applied	12 hrs

Trade Name	Type	Common Name	Company	RUP ¹	Signal Word	Days PHI ²	Hours REI ³
Poast 1.5 EC	herbicide	sethoxydim	BASF Ag. Products	No	Warning	42 days	12 hrs
Prowl 3.3 EC	herbicide	pendimethalin	BASF Ag. Products	No	Caution	Not foliarly applied	24 hrs
Prowl H2O 3.8CS	herbicide	pendimethalin	BASF Ag. Products	No	Caution	Not foliarly applied	24 hrs
Round-Up PowerMax & generics	herbicide	glyphosate	Monsanto and others	No	Caution	Not foliarly applied to tobacco	4 hrs
Satellite	herbicide	pendimethalin	United Phosphorus Inc.	No	Caution	Not foliarly applied	24 hrs
Spartan 4F	herbicide	sulfentrazone	FMC Corp.	No	Caution	Not foliarly applied	12 hrs
Spartan Charge	herbicide	sulfentrazone + carfentrazone	FMC Corp.	No	Caution	Not foliarly applied	12 hrs
Stealth	herbicide	pendimethalin	Loveland Products	No	Caution	Not foliarly applied	24 hrs
Willowood Clomazone 3ME	herbicide	clomazone	Willowood USA	No	Caution	Product not applied past 7 days after transplanting	12 hrs
Willowood Sulfentrazone 4SC	herbicide	sulfentrazone	Willowood USA	No	Warning	Not foliarly applied	12 hrs
Acephate 90 Prill	insecticide	acephate	Makhteshim Agan of North America, Inc.	No	Caution	3 days	24 hrs
Acephate 90 WDG	insecticide	acephate	Loveland Products	No	Caution	3 days	24 hrs
Acephate 90 WSP	insecticide	acephate	Loveland Products	No	Caution	3 days	24 hrs
Tenkoz Acephate 97	insecticide	acephate	Tenkoz, Inc.	No	Caution	3 days	24 hrs
Acephate 97UP	insecticide	acephate	United Phosphorus, Inc.	No	Caution	3 days	24 hrs
Acephate 97 WDG	insecticide	acephate	ADAMA	No	Caution	3 days	24 hrs
Actara 25 WG	insecticide	thiamethoxam	Syngenta Crop Protection LLC.	No	Caution	14 days	12 hrs
Admire Pro 4.6F	insecticide	imidacloprid	Bayer Crop Sciences	No	Caution	14 days	12 hrs
Agree WG	insecticide	<i>Bacillus thuringiensis</i>	Certis USA LLC.	No	Caution	No restriction stated on label	4 hrs
Alias 2F	insecticide	imidacloprid	ADAMA	No	Caution	14 days	12 hrs
Alias 4F	insecticide	imidacloprid	ADAMA	No	Caution	14 days	12 hrs
Assail 30SG	insecticide	acetamiprid	United Phosphorus Inc.	No	Caution	7 days	12 hrs
Assail 70WP	insecticide	acetamiprid	United Phosphorus Inc.	No	Caution	7 days	12 hrs
Aza Direct	insecticide	azadirachtin	Gowan Co.	No	Caution	No restriction stated on label	4 hrs
Belay 2.13	insecticide	clothianidin	Valent USA	No	Caution	14 days	12 hrs
Besiege	insecticide	lambda-cyhalothrin + chloratrailiprole	Syngenta Crop Protection LLC.	Yes	Warning	40 days	24 hrs
Biobit HP	insecticide	<i>Bacillus thuringiensis</i>	Valent USA	No	Caution	No restriction stated on label	4 hrs
Blackhawk Naturalyte	insecticide	spinosad	Dow AgroSciences	No	Caution	3 days	4 hrs

Trade Name	Type	Common Name	Company	RUP ¹	Signal Word	Days PHI ²	Hours REI ³
Brigade 2E	insecticide	bifenthrin	FMC Corp.	Yes	Warning	Do not apply later than layby	12 hrs
Brigadier 2 SC	insecticide	bifenthrin + imidacloprid	FMC Corp.	Yes	Warning	Do not apply later than layby	12 hrs
Capture LFR	insecticide	bifenthrin	FMC Corp.	Yes	Warning	Do not apply later than layby	12 hrs
Carbaryl 4L	insecticide	carbaryl	Drexel Chemical Co.	No	Caution	2 days	12 hrs
Carbaryl 4L	insecticide	carbaryl	Loveland Products	No	Caution	2 days	12 hrs
Coragen SC	insecticide	chlorantraniliprole	DuPont Crop Protection	No	Caution	1 days	4 hrs
Denim 0.16EC	insecticide	emamectin benzoate	Syngenta Crop Protection LLC.	Yes	Danger	14 days	12 hrs
Dipel DF	insecticide	<i>Bacillus thuringiensis</i>	Valent USA	No	Caution	No restriction stated on label	4 hrs
Dipel ES	insecticide	<i>Bacillus thuringiensis</i>	Valent USA	No	Caution	No restriction stated on label	4 hrs
Durivo	insecticide	thiamethoxam	Syngenta Crop Protection LLC.	No	Caution	Not foliarly applied	12 hrs
Endigo ZC	insecticide	lambda-cyhalothrin + thiamethoxam	Syngenta Crop Protection LLC.	Yes	Warning	40 days	24 hrs
Fulfill 50WDG	insecticide	pymetrozine	Syngenta Crop Protection LLC.	No	Caution	14 days	12 hrs
Javelin WG	insecticide	<i>Bacillus thuringiensis</i>	Certis USA LLC.	No	Caution	No restriction stated on label	4 hrs
Karate	insecticide	lambda-cyhalothrin	Syngenta Crop Protection LLC.	Yes	Warning	40 days	24 hrs
Lannate LV	insecticide	methomyl	DuPont Crop Protection	Yes	Danger/Poison	14 days air or fire cured, 5 days flue cured	48 hrs
Lannate SP	insecticide	methomyl	DuPont Crop Protection	Yes	Danger/Poison	14 days air or fire cured, 5 days flue cured	48 hrs
Lorsban 15G	insecticide	chlorpyrifos	Dow AgroSciences	No	Caution	7 days	24 hrs
Lorsban 4E	insecticide	chlorpyrifos	Dow AgroSciences	Yes	Warning	Not foliarly applied	24 hrs
Mocap	insecticide	ethoprop	Amvac Chemical Corporation	Yes	Danger/Poison	Not foliarly applied	48 hrs
Nuprid 2SC	insecticide	imidacloprid	Nufarm Ag. Products	No	Caution	14 days	12 hrs
Nuprid 4.6F Pro	insecticide	imidacloprid	Nufarm Ag. Products	No	Caution	14 days	12 hrs
Nuprid 4F Max	insecticide	imidacloprid	Nufarm Ag. Products	No	Caution	14 days	12 hrs
Orthene 75 SP	insecticide	acephate	Arysta Lifescience North America LLC	No	Caution	3 days	24 hrs
Orthene 97	insecticide	acephate	Amvac Chemical Corporation	No	Caution	3 days	24 hrs
Platinum	insecticide	thiamethoxam	Syngenta Crop Protection LLC.	No	Caution	Not foliarly applied	12 hrs
Platinum 75 SG	insecticide	thiamethoxam	Syngenta Crop Protection LLC.	No	Caution	Not foliarly applied	12 hrs
Sevin 4F	insecticide	carbaryl	NovaSource	No	Caution	2 days	12 hrs
Sevin XLR Plus	insecticide	carbaryl	NovaSource	No	Caution	2 days	12 hrs
Tide Acephate 90	insecticide	acephate	Tide International USA, Inc.	No	Caution	3 days	24 hrs
WDG	insecticide	acephate	Tide International USA, Inc.	No	Caution	3 days	24 hrs
Tracer Naturalyte	insecticide	spinosad	Dow AgroSciences	No	Caution	3 days	4 hrs

Trade Name	Type	Common Name	Company	RUP ¹	Signal Word	Days PHI ²	Hours REI ³
Voliam Flexi WDG Warrior II with Zeon technology	insecticide	thiamethoxam + chlorantraniprole	Syngenta Crop Protection LLC.	No	Caution	14 days	12 hrs
Widow	insecticide	lambda-cyhalothrin	Syngenta Crop Protection LLC.	Yes	Warning	40 days	24 hrs
Willowood	insecticide	imidacloprid	Loveland Products	No	Caution	14 days	12 hrs
imidacloprid 2SC	insecticide	imidacloprid	Willowood USA	No	Caution	14 days	12 hrs
Willowood	insecticide	imidacloprid	Willowood USA	No	Caution	14 days	12 hrs
imidacloprid 4SC	insecticide	imidacloprid	Willowood USA	No	Caution	14 days	12 hrs
XenTari DF	insecticide	<i>Bacillus thuringiensis</i>	Valent USA	No	Caution	No restriction stated on label	12 Hrs
Telone C-17	soil fumigant	dichloroprpene + chloropicrin	Dow AgroSciences	Yes	Danger/Poison	Not foliarly applied	5 d (120 hrs) - see label
Telone C-35	soil fumigant	dichloroprpene + chloropicrin	Dow AgroSciences	Yes	Danger/Poison	Not foliarly applied	5 d (120 hrs) - see label
Telone II	soil fumigant	dichloroprpene	Dow AgroSciences	Yes	Warning	Not foliarly applied	5 d (120 hrs) - see label
Vapam HL	soil fumigant	sodium methyldithiocarbamate	Amvac Chemical Corporation	Yes	Danger/Poison	Not foliarly applied	5 d (120 hrs) - see label
Antak	sucker control	C10 fatty alcohol	Drexel Chemical Co.	No	Caution	7 days 30 days air-cured and dark tobacco types, 7 days flue- cured	24 hrs
Butralin	sucker control	butralin	Arysta Lifescience North America LLC	No	Danger		12 hrs
Drexalin Plus	sucker control	flumetralin	Drexel Chemical Co.	No	Caution	No restriction stated on label	12 hrs
Fair 30	sucker control	maleic hydrazide	Fair Products, Inc.	No	Caution	7 days	12 hrs
Fair 80 SP	sucker control	maleic hydrazide	Fair Products, Inc.	No	Caution	7 days	12 hrs
Fair 85	sucker control	C8-C10 fatty alcohol	Fair Products, Inc.	No	Danger	No restriction stated on label	24 hrs
Fair Plus	sucker control	maleic hydrazide	Fair Products, Inc.	No	Caution	7 days	12 hrs
FluPro	sucker control	flumetralin	Arysta Lifescience North America LLC	No	Caution	No restriction stated on label	12 hrs
FST-7	sucker control	C10 fatty alcohol + maleic hydrazide	Fair Products, Inc.	No	Danger	7 days	24 hrs
Levin-38	sucker control	C10 fatty alcohol + maleic hydrazide	Drexel Chemical Co.	No	Caution	3 wk (21 days)	24 hrs
Off-Shoot-T	sucker control	C8-C10 fatty alcohol	Arysta Lifescience North America LLC	No	Danger	No restriction stated on label	24 hrs

Trade Name	Type	Common Name	Company	RUP ¹	Signal Word	Days PHI ²	Hours REI ³
Plucker Plus	sucker control	C8-C10 fatty alcohol + flumetralin	Drexel Chemical Co.	No	Caution	No restriction stated on label	12 hrs
Prime+ EC	sucker control	flumetralin	Syngenta Crop Protection LLC. Arysta Lifescience North	No	Danger	No restriction stated on label	12 hrs
Royal MH-30	sucker control	maleic hydrazide	America LLC Arysta Lifescience North	No	Caution	7 days	12 hrs
Royal MH-30 SG	sucker control	maleic hydrazide	America LLC Arysta Lifescience North	No	Caution	7 days	12 hrs
Royal MH-30 Xtra	sucker control	maleic hydrazide	America LLC Arysta Lifescience North	No	Caution	7 days	12 hrs
Royaltac	sucker control	C10 fatty alcohol	America LLC Arysta Lifescience North	No	Danger	No restriction stated on label	24 hrs
Royaltac M	sucker control	C8-C10 fatty alcohol	America LLC	No	Danger	No restriction stated on label	24 hrs
Sucker Plucker	sucker control	C8-C10 fatty alcohol	Drexel Chemical Co.	No	Danger	7 days	24 hrs
Sucker Stuff	sucker control	maleic hydrazide	Drexel Chemical Co.	No	Caution	3 wk (21 days)	12 hrs
Sucker Stuff 80 EG	sucker control	maleic hydrazide	Drexel Chemical Co.	No	Caution	3 wk (21 days)	12 hrs
Super Sucker Stuff	sucker control	maleic hydrazide	Drexel Chemical Co.	No	Caution	3 wk (21 days)	12 hrs

¹ RUP: Restricted Use Pesticide

² PHI: Pre-Harvest Interval

³ REI: Restricted-Entry Interval



AG.TENNESSEE.EDU