



Pesticide Record Book

for Private Applicators

Pesticide Record Book for Private Applicators

ROCKY MOUNTAIN POISON AND DRUG CENTER
1-800-222-1222

CHEMTREC Emergency Hotline for pesticide spills.....	800-424-9300
Colorado Department of Agriculture Division of Plant Industry - Pesticides Section	303-869-9063
State of Colorado Office of Emergency Management.....	303-273-1622
Colorado Department of Public Health and Environment Must be notified in case of major spill.....	877-518-5603
National response Center.....	800-424-8802

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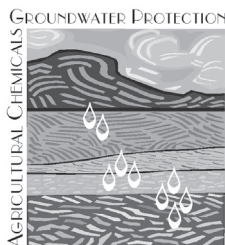
In cooperation with the Colorado Department of Agriculture

For more information contact your local CSU Extension office or
Colorado State University Extension at 970-491-6281.

Colorado State University
Fort Collins, CO 80523
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An Excel version of the tables in this book is available at:
<http://waterquality.colostate.edu/pestrecordbook.shtml>

An app version for the iPhone is available at:
<https://itunes.apple.com/us/app/crura/id967106909?mt=8>



Extension programs are available to all without discrimination.
To simplify technical terminology, trade names of products and
equipment occasionally will be used. No endorsement of products
named in intended nor is criticism implied of products not mentioned.

Pesticide Record Book for Private Applicators

The United States Department of Agriculture requires certified private pesticide applicators to keep a record of all restricted use pesticide (RUP) applications. The objective of this pocket record book is to provide you with a simple method to meet the State and Federal record keeping requirements.

This booklet can also be used to record other (non-RUP) chemical applications to comply with Worker Protection Standard requirements. Keeping good records can help save you money and improve farm management.

Guidelines in this booklet are not intended to meet the Colorado Department of Agriculture (CDA) record keeping requirements for commercial applicators. Commercial applicators must record additional information beyond what is specified here. To learn more, see Colorado Environmental Pesticide Education Program (CEPEP) fact sheet number 413 at www.cepep.colostate.edu.

Tables are provided (pages 12-51) to record field location, crop, date, pesticide brand name, Environmental Pesticide Agency (EPA) registration number, acres treated, and total amount of pesticide (see example on pages 10-11). By completing these tables, you are meeting all the federal record keeping requirements for RUPs.

Enforcement and Penalties

Colorado Private Applicators applying Restricted Use Pesticides must maintain records in accordance with the record keeping requirements outlined in 35-10-111 of the Colorado Pesticide Applicators' Act, which states:

Each licensed private applicator shall keep and maintain records of each pesticide application in the form and manner designated by the CDA. Such records shall be retained for a period of two years after the date of the pesticide application and shall be kept at the address of record on file.

Violations of the Colorado Pesticide Applicators' Act (Title 35 - Article 10 C.R.S.) and the associated Rules of the is Act are **punishable by civil penalties up to \$2000 per violation**; this includes failure to comply with its associated Rules and any requirements of the federal worker protection standards set forth in 40 CFR part 170 (often referred to as WPS).

Please contact the CDS at (303) 869-9063 and ask to speak to a representative in the Pesticides Program to answer any questions you may

have or to obtain a copy of the Pesticide Applicators' Act and its associated Rules to ensure you are in compliance.

Record Keeping Requirements for Restricted Use Pesticide (RUP) Application

Your records must include:

- brand or product name
- EPA registration number
- location of application
- crop, stored product, commodity, or site treated
- day, month, and year applied
- size of area treated (or spot treatment)
- total amount of pesticide applied (rate x area applied)
- name and certification number of applicator

These records must be logged within 14 days and maintained for two years following the pesticide application. *See example on page 10.*

Tables are provided on pages 56-57 for you to record the brand name, active ingredients, and EPA registration number of commonly used RUP's. Other chemicals may be designated as RUP's at any time. Check the pesticide label or visit with your dealer to obtain this information.

For RUP Applications Requiring Fumigation Management Plans (FMP)

Some RUP applications require FMPs. Beginning in 2003, the USEPA has required applicators of fumigants to complete an FMP prior to application. Fumigants requiring FMPs include those used for stored commodities (stored grain), structures (grain bins), or to control burrowing rodents (prairie dogs, pocket gophers).

The FMP requirements and elements of the FMP can be found in the product's label application booklet. FMP examples and templates can be found on the CDA- Division of Plant Industry website located at www.colorado.gov/ag/dpi under Pesticide Applicator Program.

Fumigant application records and management plans must be kept by the applicator for two years from the date of the application. For more information, please consult the CDA at (303) 869-9063.

Commercially Applied Pesticides

If the pesticide was custom-applied, you can use tables on pages 52-55 to record the application date, field, brand name, and the applicator's name and phone number.

The state and federal pesticide record keeping regulations require all commercial applicators to furnish a copy of the required data to the customer within 30 days of the RUP application. These records must be maintained by the customer for three years following application.

How to Record Spot Treatments

Spot treatments are especially useful to control localized pest outbreaks. Spot treatments applied to a total area of less than 1/10 of an acre in the same day require the following records:

- brand or product name
- EPA registration number
- location of application designated as "spot application", followed by a description. (For example: the location could be recorded as "spot application", followed by "treated for noxious weeds on Fields A, C, and all pastures.")
- month, day, and year applied

Spot treatments can be recorded in the tables with the other RUP records.

Worker Protection Standards (WPS) 40 CFR Part 170

Any producer who employs individuals must comply with WPS requirements. These requirements are specified on product labels under the "Directions for Use" or "Agricultural Use Requirements" section which includes information on personal protective equipment, restricted entry, and posting.

For more information about WPS please contact CDA at (303) 869-9063 or visit their website at: www.colorado.gov under Plants, Pesticides, Private Applicators.. You may also visit CEPEP's website at www.cepep.colostate.edu or call CEPEP at (970) 491-3947.

Description of Required RUP Records

Location of treated area: You must be able to locate the field two years following application. The law suggests any of the following designations:

- county, range, township, and section
- maps or written descriptions
- a USDA identification system such as those used by the Farm Services Agency or NRCS which involves maps and a numbering system to identify field locations
- the legal property description

Brand name: The product's trade name.

EPA registration number: The Environmental Protection Agency has placed a number on all chemicals identifying, which chemical is used. This number is located on the label of the product used.

Acres treated: The number of acres in which chemicals were used.

Total amount: Total amount of pesticide used, *not* the quantity after water or other substances were added. Record units as specified on the label (pints, ounces, pounds).

Total amount = rate x area applied

Information required for WPS record keeping:

In addition to the required RUP records, you may want to record the following information for compliance with WPS.

- Application time (start/end time)
- Restricted Entry Interval (REI)
- Active ingredient(s) of product applied

Required WPS records that are also required for RUPs are *application date, application location, brand name and EPA registration #*.

Other useful, but optional information: that you may want to record for future reference on the second individual field record page includes:

- application rate of chemical
- gallons per acre (GPA)
- additive
- nozzle type
- wind speed and direction
- air temperature

List of RUPs in Colorado

A list of state and federal pesticide products registered for use in Colorado is available to interested parties by contacting the CDA at (303) 869-9063 or on the web at www.colroad.gov/agplants under Plants, Pesticides, Restricted Use Pesticide dealers. Files are available for review or downloading.

EXAMPLE REQUIRED Restricted Use Pesticide Application Records

Field Name and Location: (W) Circle 2, Weld Co. SW 1/4 Sec 30
T4NR65W

Crop: Grain Corn (W)

Applicator: John Smith*

Application Date: (W)	4-25-13	4-25-13	5-30-05	
Brand Name: (W)	BalancePro	Atrazine4L tank mixed	Counter15G	
EPA Reg. #: (W)	264-600	34704-69	5481-545	
Acres Treated:	120	120	120	
Total Amount:	360oz	60 lbs	960 lbs	

(W) = categories also required for WPS records

EXAMPLE Additional Information Required for WPS Compliance

Application Start Time: (W)	1:30 pm	1:30 pm	8:00 am	
Application End Time: (W)				
REI: (W)	12 hr	12 hr	48 hr	
Active Ingredient: (W)	isoxaflutole	atrazine	terbufos	

EXAMPLE Optional Information

Adjuvant:	AMS	same	-	
Nozzle:	XR 8002	same	-	
Wind:	1 mph NW	same		
Rate:	3 oz/A	0.5 lbs/A	8 lbs/A	
GPA:	20	same		

* You must fill in your name and certification number on the inside front cover of this record book.

EXAMPLE REQUIRED Restricted Use Pesticide Application Records

Field Name and Location: (W)

Crop: (W)

Applicator:

Application Date: (W)						
Brand Name: (W)						
EPA Reg. #: (W)						
Acres Treated:						
Total Amount:						

(W) = categories also required for WPS records

EXAMPLE Additional Information Required for WPS Compliance

Application Start Time: (W)					
Application End Time: (W)					
REI: (W)					
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EXAMPLE Optional Information

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EXAMPLE Record of Custom-Applied RUPs**Records**

Date:	Field:	Brand Name of Pesticide:	Custom Applicator (name, phone number):
7/25/13	N Quarter	Comite II	Bud Jones, 555-2345

Record of Custom-Applied RUPs

Date:	Field:	Brand Name of Pesticide:	Custom Applicator (name, phone number):

Record of Custom-Applied RUPs

Date:	Field:	Brand Name of Pesticide:	Custom Applicator (name, phone number):

Sprayer Calibration

Calibration of your spraying equipment is essential to achieving desired pest control at the correct rate. Recalibrate following changes to speed, nozzle, pressure, or carrier.

Adjustable factors which determine calibration and affect application rate are:

- speed
- pressure
- nozzle size and type
- a combination of the above

Speed is the easiest and most common adjustment.

Three Calibration Methods

Method I:

1. Measure nozzle flow rate: gal/nozzle/min =

$$\frac{\text{ounces collected for 1 min from 1 nozzle}}{128}$$

2. Calculate gallons per acre =

$$\frac{\text{gal/noz/min} \times 12 \times 43,560}{\text{nozzle spacing} \times \text{speed}}$$

- Nozzle spacing = inches between nozzles
- Speed = MPH x 88
- Test several nozzles to ensure uniformity and replace any that have >5% variation from the average of all nozzles

Method II:

1. Spray 660 feet at the desired speed and pressure.
2. Determine the amount of spray discharge (water) traveling this distance.
3. Use this formula:

$$\text{gallons/acre} = \frac{\text{gallons used in 660 feet} \times 66}{\text{swath width in feet}}$$

Method III:

1. Fill spray tank and spray a specified number of feet.
2. After spraying, refill the tank, measuring the gallons needed to refill.
3. Use this formula:

$$\text{gallons/acre} = \frac{43,560 \times \text{gallons needed to refill}}{\text{distance sprayed} \times \text{swath width (ft)}}$$

Calibration for Center Pivot Chemigation

Only products that are *specifically labeled* for chemigation may be applied through center pivot irrigation systems. The label may also contain specific chemigation requirements that must be followed. The following calculations will help you determine the injection pump setting for the proper application rate.

1. Acres to be treated

$$\text{acres} = \frac{\pi r^2}{43,560}$$

where $\pi = 3.14159$ and

r = system length, including the reach of the end gun

2. Acres treated per hour or per minute (*do not run sprinkler dry*)

$$\text{acres/hour} = \frac{\text{acres to be treated}}{\text{revolution time (hr) at desired inches of water}}$$

or

$$\text{acres/minute} = \frac{\text{acres/hour}}{60}$$

3. Calculating initial pump setting

Depending on the manufacturer of your injection pump, you will need to initially set up the pump in either gallons per hour (gal/hr) or %. The following calculations will help you make the correct setting.

__ pints per acre x __ acres (from 1.) = pints total mixture

__ pints / 8 (pints per gallon) = gallons

__ gallons / __ hours per revolution = gallons per hour

__ gallons per hour / max. pump capacity = % (dial setting)

4. Pump output

After initially calibrating the pump, it is a good idea to fine-tune your pump output. Follow these steps:

- Run liquid into calibration tube
- Set top O-ring at 2 inches below liquid level, set bottom O-ring below top O-ring by the amount of liquid to be pumped in 1 minute
- Set stop watch to time for 1 minute
- While pump is running, turn tank valve off
- Start watch when liquid level reaches the top O-ring
- If liquid level is past bottom O-ring before time is up, turn down micrometer dial; if liquid level does not reach bottom O-ring, turn micrometer dial up

The *Colorado Chemigation Act* requires a chemigation permit and the appropriate anti-siphoning devices to be used when applying pesticides and fertilizers in closed irrigation systems. Contact the Colorado Department of Agriculture at 303-869-9063 for updated information on these requirements.

Useful Formulas

- Amount of active ingredient (ai) needed:**

$$\text{gallons or pounds} = \frac{\text{acres to spray} \times \text{lb ai/A}}{\text{lb ai/gal or ai/lb}}$$
- Amount of purchased material to use:**

liquids (gallons required/A) = $\frac{\text{lb ai/A}}{\text{lb ai/gal}}$

wettable powders (lbs required/A) = $\frac{\text{lb ai/A}}{\% \text{ ai in formulation}}$
- Size of pump** needed to apply gallons/acre desired:

$$\text{pump capacity} = \frac{\text{gal/A desired} \times \text{boom width (ft)} \times \text{MPH}}{495}$$
- Sprayer tank capacity** by tank geometry (in inches):

 1. Cylindrical Tanks:

$$\text{gallons} = \text{length} \times \text{diameter}^2 \times 0.0034$$
 2. Elliptical Tanks:

$$\text{gallons} = \text{length} \times \text{short diameter} \times \text{long diameter} \times 0.0034$$
 3. Rectangular Tanks:

$$\text{gallons} = \text{length} \times \text{width} \times \text{depth} \times 0.004329$$
- Nozzle capacity** in gallons/minute at a given rate/acre and MPH:

$$\text{nozzle capacity} = \frac{\text{gal/A} \times \text{nozzle spacing (in)} \times \text{MPH}}{5940}$$
- Nozzle flow rate:**

Fill a container marked in ounces from a flowing nozzle for a 5 seconds.

$$\text{gallons/minute/nozzle} = \text{ounces} \times 0.094$$

- *Acres/hour* sprayed:

$$\text{acres/hour} = \frac{\text{swath width (in)} \times \text{MPH}}{100}$$

$$\text{acres/hour} = \frac{\text{boom width (ft)} \times \text{MPH}}{12}$$

- *Rows per acre*:

$$\text{rows/acre} = \frac{43,560}{\text{row spacing (ft)} \times \text{row length (ft)}}$$

Calculations for Speed

Rate of speed in MPH:

Measure the seconds it takes your tractor to go a distance of 300 to 500 feet.

$$\text{MPH} = \frac{\text{distance traveled (ft)}}{1.47 \times \text{time (seconds)}}$$

Miles per hour converted to feet per minute

<i>MPH</i>	<i>FPM</i>
1	88
2	176
3	264
4	352
5	440

Time required in seconds to travel a distance of:

<i>MPH</i>	<i>100 ft</i>	<i>200 ft</i>	<i>300 ft</i>
1.0	68	136	205
1.5	45	91	136
2.0	34	68	102
2.5	27	55	82
3.0	23	45	68
3.5	19	39	58
4.0	17	34	51
4.5	15	30	45
5.0	14	27	41
5.5	—	25	37
6.0	—	23	34
6.5	—	21	31
7.0	—	19	29
7.5	—	18	27
8.0	—	17	26
8.5	—	16	24
9.0	—	15	23

Acres covered from swath width and distance traveled:

$$\text{Acres} = \text{distance traveled (ft)} \times \text{swath width (ft)} \times 0.000023$$

Or use the following table:

Distance traveled (ft)	Acres covered for a swath width of (ft):							
	10	20	40	50	60	90	100	120
100	0.02	0.05	0.09	0.12	0.14	0.21	0.23	0.28
150	0.03	0.07	0.14	0.17	0.21	0.31	0.35	0.41
200	0.05	0.09	0.18	0.23	0.28	0.41	0.46	0.55
250	0.06	0.12	0.23	0.29	0.35	0.52	0.58	0.69
300	0.07	0.14	0.28	0.35	0.41	0.62	0.69	0.83
350	0.08	0.16	0.32	0.40	0.48	0.72	0.81	0.97
400	0.09	0.18	0.37	0.46	0.55	0.83	0.92	1.10
450	0.10	0.21	0.41	0.52	0.62	0.93	1.04	1.24
500	0.12	0.23	0.46	0.58	0.69	1.04	1.15	1.38
600	0.14	0.28	0.55	0.69	0.83	1.24	1.38	1.66
700	0.16	0.32	0.64	0.81	0.97	1.45	1.61	1.93
800	0.18	0.37	0.74	0.92	1.10	1.66	1.84	2.21
900	0.21	0.41	0.83	1.04	1.24	1.86	2.07	2.48
1000	0.23	0.46	0.92	1.15	1.38	2.07	2.30	2.76
1200	0.28	0.55	1.10	1.38	1.66	2.48	2.76	3.31
1300	0.30	0.60	1.20	1.50	1.79	2.69	2.99	3.59
2600	0.60	1.20	2.39	2.10	3.59	5.38	5.98	7.18
3960	0.91	1.82	3.64	4.55	5.46	8.20	9.11	10.9
5280	1.21	2.43	4.86	6.07	7.29	10.9	12.1	14.6

Useful Conversion Factors:

1 acre = 43,560 ft²

1 gallon = 128 fluid ounces = 3785 milliliters

1 gallon = 4 quarts = 8 pints

1 gallon = 16 cups

1 gallon = 8.35 pounds of water

1 quart = 32 fluid ounces = 946 milliliters

1 quart = 2 pints

1 pint = 16 fluid ounces

1 ounce = 28.35 grams

1 ounce = 29.57 milliliters

1 pound = 16 fluid ounces of water

1 acre-inch = 27,154 gallons

1 cubic foot = 7.48 gallons

1 cubic foot = 624 pounds of water

1 cubic meter = 1,000 liters

1 cubic meter = 264.2 gallons

Useful Conversions — U.S. to Metric

<i>U.S.</i>	<i>Metric</i>	<i>Multiply by</i>
acre	hectare	0.4047
mile	km	1.6090
yard	meter	1.9144
foot	meter	0.3048
inch	cm	2.5400
mile ²	km ²	2.5900
foot ²	meter ²	0.0929
foot ³	meter ³	0.0283
gallon	liter	3.7850
quart	liter	0.9463
pint	liter	0.4732
pint	ml	473.20
oz (fl)	ml	29.570
ton	metric ton	0.9078
pound	kilogram	0.4536
pound	gram	454.59
ounce	gram	28.349
lb/A	kg/ha	1.1209
gal/A	L/ha	9.3538
oz (dry)/gal	g/L	7.4892
oz (dry)/A	g/ha	70.054
oz (fl)/gal	ml/L	7.8125
oz (fl)/A	ml/ha	73.079

Useful Conversions — Metric to U.S.

<i>Metric</i>	<i>U.S.</i>	<i>Multiply by</i>
hectare	acre	2.4710
km	mile	0.6214
meter	yard	1.0940
meter	foot	3.2810
cm	inch	0.3937
km ²	mile ²	0.3861
meter ²	foot ²	10.760
meter ³	foot ³	35.310
liter	gallon	0.2642
liter	quart	1.0570
liter	pint	2.1130
ml	pint	0.0338
ml	oz (fl)	0.0021
metric ton	ton	1.102
kilogram	pound	2.2050
gram	pound	0.0022
gram	ounce	0.0353
kg/ha	lb/A	0.2048
L/ha	gal/A	0.1069
g/L	oz (dry)/gal	0.1335
g/ha	oz (dry)/A	0.0143
ml/L	oz (fl)/gal	0.1280
ml/ha	oz (fl)/A	0.0137

Additional Resources

Best Management Practices

Follow these guidelines on pesticide safety, water quality protection, and integrated pest management to protect yourself, your family, and your environment.

- Read the label. Then read it again. Remember, every label says “It’s a violation of Federal law to use this product in a manner inconsistent with its labeling.”
- Read all label instructions prior to chemical mixing.
- Follow label specifications for all pesticide applications.
- Maintain application equipment in good working condition.
- Calibrate equipment before each application season and check calibration frequently to ensure correct rate of application. See calibration guidelines on pages 58-59.
- Follow the established re-entry time as stated on the label.
- Avoid over-spray and drift, especially when surface water or sensitive non-target species or crops are nearby.
- Avoid applying pesticides within 100 feet of wells and surface water.
- Do not mix, load, or store pesticides within 100 feet of wells.
- Know what to do in case of accidental pesticide poisoning. Emergency phone numbers are located on the first page of this booklet. Labels also contain emergency information.

- Clean spray tanks and spray equipment at the application site.
- Triple rinse or pressure rinse one-way pesticide containers immediately after emptying.
- Puncture empty pesticide containers and dispose of according to label directions.
- Do not burn or dispose of containers on-farm.
- Spot spray and band herbicides rather than broadcasting, when appropriate.
- Avoid repetitive use of the same pesticide, or pesticides of similar chemistry, to reduce the potential for surviving pests to develop pesticide resistance.
- Minimize drift by not spraying on extremely hot and windy days.
- Store pesticides in the their original containers with intact, visible, and legible labels.
- Follow all label directions for storing/mixing of pesticides.
- Mix and load at the application site (in the field) whenever possible.
- Mix only the amount of pesticide that will be used for a given application.
- Purchase the correct amount of product needed and return unopened containers for credit.

Pesticide Disposal

Unwanted pesticides and pesticide wastes can be disposed of through Colorado's waste collection program. Information on various companies that can assist with waste collection can be found at the Colorado Department of Agriculture's website: <https://www.colorado.gov/pacific/agconservation/pesticide-waste-disposal>. You can also visit CEPEP's website at: www.cepep.colostate.edu for more information.

Helpful Publications

You can acquire the following publications by calling the Colorado State University resource Center at (970) 491-6198 or at www.extension.colostate.edu, or contact your local Extension office.

- Pesticide and Fertilizer Storage and Handling- Best Management Practices (XCM-178)
- Pesticide Use and Water Quality in Agriculture- Best Management Practices (XCM-177)
- Sprayer Calibration Fundamentals (Fact Sheet no. 5.003)
- Agricultural Pesticide Protective Equipment (Fact Sheet no. 5.021)
- High Plains IPM Guide Bulletin 546A for Colorado, Nebraska, and Wyoming (online only at wiki.bugwood.org/HPIPM)
- The National Pesticide Information Center (NPIC) is also a great resource for pesticide safety information. Contact eh NPIC at 1-800-858-7378 or npic.orst.edu.
- An Excel version of the tables in this book is available at: <http://waterquality.colostate.edu/pestrecordbook.shtml>
- An app version for the iPhone is available at: <https://itunes.apple.com/us/app/crura/id967106909?mt=8>

Colorado Environmental Pesticide Education Program (CEPEP)

CEPEP is committed to providing accurate, up-to-date information on pesticide laws and regulations, environmental protection, worker protection, and pesticide safety for applicators, trainers, agricultural workers and supervisors, and the general public. Contact us at 970-491-3947, or learn more at our website: www.cepep.colostate.edu.

CEPEP has revised many pest control study guides for applicators' training to be certified in both private and commercial categories. These study guides are available at Colorado State University's Resource Center on the web at <http://urc.colostate.edu>, or call 970-491-6198 or toll free 877-692-9358.

Our program also maintains a media library with pesticide training videos and DVDs, as well as CD-ROM information tools and other multimedia resources. Find our media library at www.cepep.colostate.edu/Resources/html.

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