The Pesticide Applicator Report

News for Vermont's Pesticide Applicators from the Vermont Agency of Agriculture, Food & Markets and UVM Extension





Spring 2019 Volume 20 – Issue 1

In This Issue:

- Navigating the Vermont Agency of Agriculture Pesticide Program & the UVM Extension Pesticide Safety Education Program websites
- "Nearly No Math"
 Calibration and
 Pesticide Mixing:
 Boom & Hand
 Sprayers
- A review of Pests and Diseases: Summer 2018
- Helpful Contacts
- New Online Courses
- Practical Math for Pesticide Applicators
- Home Study Quizzes

Navigating the Vermont Agency of Agriculture Pesticide Program website: What's what & where to

find it - Anne Macmillan, Vermont Agency of Agriculture

Not a day goes by when I don't field questions from current or prospective certified applicators regarding their credit status, how to obtain credits, what study manuals they need to purchase to prepare, etc. Answers to many of these questions can be found on our website. The following article will elaborate on where to find information you are looking for.

- The **Vermont Agency of Agriculture** home page is here: https://agriculture.vermont.gov/.
- The Pesticide Program is under the **Division of Public Health and Resource Management** (you can find this link on the left side of our home page): https://agriculture.vermont.gov/public-health-agricultural-resource-management-division.
- Scroll down this page above and you will find the Pesticide Program link. Click on that link and you will go to the **Pesticide Programs** home page: https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/pesticide-programs.

Be sure to bookmark this page for future use as it can be a challenge to find!

Many useful links are evident as you scroll down the page...

(continued)

The **Pesticide Applicator Resources** page provides information on Pesticide Applicator Certification as well as the types of Applicator Certification in Vermont. Ordering category specific manuals as well as downloading specific inserts is done here.

The Applicator Training & Recertification page provides resources to those who are certified and how to remain certified. The Pesticide Applicator Meeting Search link, as well as links to past Pesticide Applicator Reports (PAR) are also on this page. Twice yearly, PARs are sent to all currently certified applicators. These reports contain relevant and timely updates and review regarding pesticides in Vermont, as well as quizzes which can be printed off and submitted for one credit each. Recent older PARs are found on that page.

The **Reciprocal Applicator Information** page has information on reciprocity as well as a link to forms for applicator and company licenses and pesticide applicator use reports at https://agriculture.vermont.gov/licensing-registration-library.

The **Pesticide Dealer Resources** page is for licenses that are issued to individuals that sell Class A or Class B pesticides from a retail outlet located in Vermont. The schedule of exams as well as the Annual Sales Storage Form for Class A Dealers (mandatory annual submission) and the Restricted Use Sales Form (must remain onsite for at least 2 years) are available here.

The **Pesticide Exam Information** page provides information on age requirements, retake fee policy and provides exam locations and dates.

The **Product Registration & Classification** page covers just that! Trying to find out if a product is registered in Vermont? Look no further.

Public Health & Agricultural Resource Management

Plant Health and Pest Management

Pesticide Programs

Pesticide Applicator Resources

Applicator Training & Recertification

Reciprocal Applicator Information

Pesticide Dealer Resources

Pesticide Exam Information

Pesticide Product Registration & Classification

Worker Protection

Pesticide Permits

Golf Course Information & Resources

Advisory Council

Usage Reported

Endangered Species

Navigating the UVM Extension Pesticide Safety Education Program website: A resource for training and information

Sarah Kingsley-Richards, UVM Extension PSEP

The UVM Pesticide Safety Education Program (PSEP) works closely with the Vermont Agency of Agriculture, Food & Markets (VAAFM) to provide training and education resources for current and prospective pesticide applicators.

uvm.edu/extension/psep

(802) 656-0475

Many useful links can be found on the PSEP website...

The Destrict Annalism to Demont Coming 2010 Days 2 of 14

Certification: Anyone in the state of Vermont who uses, supervises, recommends, or sells pesticides and/or trains Worker Protection Standard handlers/workers may be required to take and pass the CORE exam and all appropriate category exams to become certified. There are two flowcharts on the PSEP website to help determine Do I Need to be Certified? and Which Certification Do I Need? Always double check with VAAFM to verify certification requirements.

CORE Training: Resources to help study for the Vermont Pesticide Applicator CORE exam. Find information on our annual training workshops (see below). The CORE Manual Review Online Course is a new option that covers all the same material as the workshops for anyone who cannot make a training.

Initial Certification Review and Exam

White River Junction: April 23, 2019

Burlington: April 24, 2019

Details and registration at www.edu/extension/psep

Other Pesticide Training: Find information on recertification workshops. The Pesticide Recertification Course Locator can be used to both register and search for approved trainings. Four new CORE Manual Review Online Course Units (for credit) are available for one (1) recertification credit each.

The Pesticide Applicator Report: Current and back issues for Vermont's pesticide applicators published by UVM Extension and VAAFM. Includes mail-in quizzes for pesticide recertification credits.

Quick Links: Specific VAAFM Pesticide Program pages are linked that discuss certification, manuals, and exams. There are also useful direct links to the USA Plants pages used by VAAFM to register workshops for credits and maintain pesticide license records that individual applicators can look up to see their current credits (use the last four digits of your VT certificate number). There are links to two databases of registered pesticide labels that can be helpful for researching purchases. Also linked is the National Pesticide Information Center, which provides information about pesticides and pesticide-related topics to enable people to make informed decisions.

Boom Sprayer Calibration Example:

(see article next page)

Broadcast pesticide application on a 30 acrefield at a rate of 2 pts/ acre.

- Nozzle spacing is 22 in.
- Based on a 22-inch nozzle spacing, you need to drive 186 ft. (see table below).
- It took 32 seconds to drive 186 ft.
- Output per nozzle for 32 seconds is 13 ounces. This means the sprayer is applying 13 GPA
- 32 fl.oz. (=2 pts.) of pesticide per acre divided by 13 GPA = 2.46 fl.oz. Each gallon of solution in the sprayer must include 2.46 fl.oz. of the concentrate
- Multiply 2.46 fl.oz. per gallon by the 200 gal. capacity of the tank = 492 fl.oz. of product per tank load.
- You will need 390 gal. of finished spray to treat the entire field (30 acres X 13 GPA)

"Nearly No Math" Calibration and Pesticide Mixing: Boom Sprayer Worksheet for Broadcast Spraying

Adapted from an article from the NC Private Applicator Recertification 2012-2014 by Wayne Buhler, Pesticide Safety Extension Specialist

- **Step 1.** Fill the sprayer half full with water (no pesticide).
- **Step 2.** From the table, use nozzle spacing (distance between nozzles on your spray boom) to determine the distance that the sprayer must travel for each nozzle to spray 1/128th of an acre.
- **Step 3.** Measure the course distance in the field and flag it for easy visibility.
- **Step 4.** Record the seconds it takes to drive the measured distance at the desired spraying speed without spraying. Be sure to take a "running start" at the starting flag so your tractor/sprayer reaches the desired speed before you begin timing. For best results, repeat this step at least twice and use the avg. number of seconds it took to drive the course.
- **Step 5.** Park the tractor/sprayer, set the brakes, but keep the engine rpm at the same setting used to drive the course.
- **Step 6.** Catch spray from each nozzle, one at a time, in a container marked in ounces for the time noted in step 4. The amount of water collected in ounces from one nozzle equals gallons per acre (GPA) applied for the entire sprayer. If the output from any nozzle is more than 10% above or below the avg. from all nozzles, clean or replace that nozzle.
- **Step 7.** Divide the amount of pesticide per acre (based on the labeled rate in oz., pts., or qts. of pesticide concentrate per acre) by the GPA (from Step 6), to determine the amount of

pesticide to mix into each gallon of finished spray solution.

Step 8. To calculate the amount of pesticide concentrate to add to each tank, multiply the amount of pesticide/gallon (from Step 7) by the tank capacity (or amount needed for the treatment site) = total amount of pesticide to add to each tank load.

Nozzle	
Spacing	Distance
(inches)	(feet)
6	681
8	510
10	408
12	340
14	292
16	255
18	227
20	204
22	186
24	170
26	157
28	146
30	136
32	128
34	120
36	113
38	107
40	102
42	97
44	93
46	89
48	85

To calculate **how much area a full tank will cover**, divide the capacity of the tank by the GPA output. **Example:** 200 gal. tank divided by 13 GPA = 15.38 acres per tank load.

"Nearly No Math" Calibration and Pesticide Mixing: Hand or Back Pack Sprayer Worksheet

Adapted from an article from the NC Private Applicator Recertification 2012-2014 by Wayne Buhler, Pesticide Safety Extension Specialist

Step 1. Mark a square area of 18.5 by 18.5 ft., which is roughly equal to 1/128th of an acre. If possible, do this in the field on which you will be spraying.

Step 2. Fill the sprayer half full with water and pump it to the desired operating pressure. Spray over a dry surface to see that the nozzle forms a uniform spray pattern. When using a flat fan tip, hold the nozzle at a constant height above the ground.

Step 3. Time the number of seconds it takes to "spray" the calibration plot. Be sure to maintain a constant spray pressure. It will take about 6 passes through the area for complete coverage. For best results, repeat this step at least twice and use the avg. number of seconds it took to cover the area.

Step 4. Maintain a constant sprayer pressure while you spray into a container marked in ounces for the time calculated in Step 3. The number of ounces collected in the container is equal to the number of gallons of water per acre (GPA) the sprayer is delivering. (There are 128 ounces in a gallon, so ounces collected in 1/128th of an acre convert directly to gallons per acre.)

Step 5. Divide the amount of pesticide per acre (based on the labeled rate in oz., pts., or qts. of pesticide concentrate per acre) by the GPA (from Step 4), to determine the amount of pesticide to mix into each gallon of finished spray solution.

Step 6. To calculate the amount of pesticide concentrate to add to each tank, multiply the amount of pesticide/gallon (from Step 5) by the tank capacity (or amount needed for the treatment site) = total amount of pesticide to add to each tank load.

Hand Sprayer Calibration Example:

Let's assume it takes you 28 seconds to "spray" the calibration plot.

- After spraying into the cup for 28 seconds, you measure 20 ounces of water.
- 20 ounces collected over 1/128th of an acre = 20 gallons per acre (GPA).
- Your backpack holds 3.5 gallons.
- You want to spray a pesticide at 2 pts./acre...(2 pts. = 32 fl.oz.)
- 32 fl.oz. of pesticide divided by 20 GPA = 1.6 fl.oz. Each gallon of solution in the sprayer must include 1.6 fl. oz. of the concentrated pesticide.
- Multiply 1.6 fl.oz. per gallon by the 3.5 gallon capacity of your backpack. (1.6 X 3.5 = 5.6 fl.oz. of product per tank load).

To calculate **how much area a full tank will cover**, divide the capacity of the tank by the GPA output. **Example:** 3.5 gallon tank divided by 20 GPA = 0.175 acres per tank X 43,560 sq.ft./acre = 7,623 sq.ft.

Common Conversions:

1 gal. = 4 qts. = 8 pts. = 16 cups = 128 fl.oz. 1 Tablespoon = 3 teaspoons = 0.5 fl.oz. = 15 ml.

The Descript Application Descript Coming 2010 Descript 14

A Review of Pests and Diseases: Summer 2018

Ann Hazelrigg, UVM Plant Diagnostic Clinic

What a crazy summer. It was dry for the most part in Chittenden County, but other counties such as Windham had substantially **more rain**. Even if the rainfall for the month was close to the average, those rain events were not always evenly spread across the month, but often arrived in the form of downpours. I had many more phone calls about defoliation of crabapples and a lot more diseases in vegetable plants from those counties that had lots of rain.

Deluges result in water-saturated soils, a key condition promoting soil borne diseases.

Unfortunately rain events followed by drought may be the new normal and can impact the incidence and severity of plant diseases and pests. With warm dry conditions we see a lot fewer foliar fungal diseases on our plants. In Chittenden County, I noticed minor amounts of some of our more common fungal diseases such as early blight in tomatoes or apple scab.

Fluctuations in soil moisture levels can also impact crops.

- Tomatoes and peppers are susceptible to uneven soil moisture and calcium movement in the plant leading to an abiotic disorder called blossom end rot. This results in brown sunken areas at the blossom end of the tomato fruit and often on the ends and sides of peppers.
- Nutrient deficiencies in plants as a result of fertilizer leaching in addition to increased fertilizer runoff can also occur with extreme rain events.

Mulching plants and consistent drip irrigation can help alleviate some of the moisture fluctuations in soils.

Temperatures on the whole were **hot across** the state.

- Above about 85 degrees, tomatoes, eggplants and peppers may drop their blossoms resulting in no fruit.
- During hot temperatures corn silks may dry faster, leading to 'zippering' where entire rows of kernels are missing.
- In the Clinic we received a few samples and pictures of misshapen fruit in cucumbers and zucchini due to incomplete pollination since high temperatures can cause the pollen to dry too fast.
- Warm dry conditions can lead to higher incidence and severity of powdery mildews, common foliar fungi that attack and reduce the vigor of several vegetable and ornamental plants.
- Higher temperatures can also favor arthropods like thrips or two spotted spider mites that prefer warm dry conditions. This may lead to thrips problems in crops such as onions or gladiolus and mite damage in several vegetable and ornamental plants.

The good news is for the second year in a row, we did not have any incidence of tomato or potato late blight in the state. This fungus-like pathogen that was responsible for the Irish potato famine, overwinters in the southern part of the US. Whether or not it makes it to Vermont often depends on the patterns of storms from the south. The pathogen becomes active in the spring and is carried on storm fronts, 'leapfrogging' its way to the north.

The Destining Application Property Coming 2010 Property of 14

The progress of the disease is tracked nationally at a website called USA blight https://usablight.org/map. As the pathogen travels, plant pathologists in each state report the first and repeated occurrences of the disease by county so we can track the progression as the season unfolds.So far this year, there are no reports of the disease in Florida or other southern states, although this will likely change soon.

With new weather extremes, gardeners and commercial growers will face new pest and disease challenges. The UVM Plant Diagnostic Clinic (commercial growers) and the Master Gardener Helpline (home gardeners) can help you identify and manage these issues.

Commercial Growers:

UVM Plant Diagnostic Clinic (802) 656-0493 .uvm.edu/extension/pdc

Homeowners:

UVM Master Gardener Helpline (802) 656-5421 uvm.edu/extension/mastergardener/helpline

ARM Agent Territories

| Committee | Control |

See also: Helpful Contacts for Pesticide Applicators

The Pesticide Applicator Report – Spring 2019 Page 7 of 14

Helpful Contacts for Pesticide Applicators

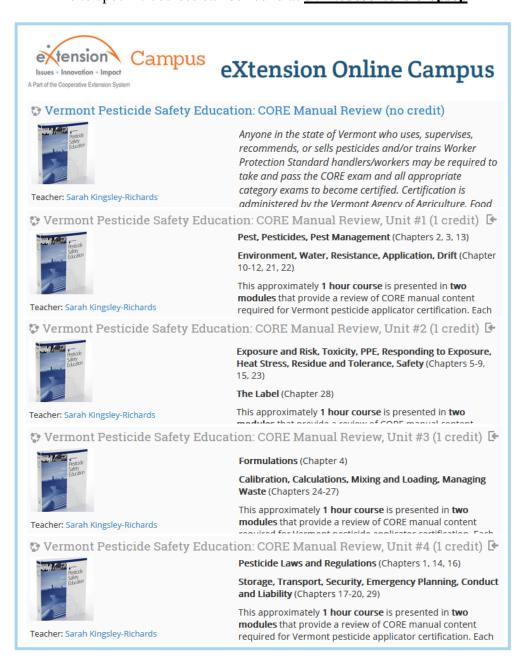
Vermont Agency of Agriculture, Food & Markets

Field Agent NE	(802) 793-1628	Bethany.Creaser@vermont.gov
Field Agent SW	(802) 793-2167	Dominique.Golliot@vermont.gov
Field Agent SE	(802) 793-2547	Doug.Johnstone@vermont.gov
Field Agent NW Golf Course Permit Coordinator	(802) 318-1383	Matthew.Wood@vermont.gov
Certification & Training Toxicologist	(802) 828-3479	Anne.Macmillan@vermont.gov
Agrichemical & Plant Industry Director	(802) 828-6531	Cary.Giguere@vermont.gov
Agrichemical Section Chief	(802) 828-6417	Linda.Boccuzzo@vermont.gov
Agrichemical Research & Policy Specialist	(802) 917-2073	Erica.Cummings@vermont.gov
Groundwater Monitoring Program Manager	(802) 522-6858	Patti.Casey@vermont.gov
Entomologist	(802) 828-1319	Judy.Rosovsky@vermont.gov
University of Vermont Extension		
Pesticide Safety Education Program	(802) 656-0475	Sarah.Kingsley@uvm.edu
Pesticide Safety Education Program Plant Diagnostic Clinic	(802) 656-0493	Ann.Hazelrigg@uvm.edu
Vegetable & Berry	(802) 257-7967 x303	Vernon.Grubinger@uvm.edu
Entomology	(802) 656-5440	Margaret.Skinner@uvm.edu
Field Crops & Nutrient Management	(802) 388-4969 x332	Jeff.Carter@uvm.edu
Agronomy	(802) 656-0478	Sid.Bosworth@uvm.edu
Agronomy	(802) 524-6501 x437	Heather.Darby@uvm.edu

NEW! Training and Recertification Credit Online Courses

Online courses are now available through **eXtension Campus**, part of the national Cooperative Extension System. eXtension Campus (<u>campus.extension.org</u>) requires you to create a free account to enroll in courses. Your participation in courses will be recorded and any recertification credits will be tied to your account. Upon completion of Vermont credit courses, a certificate will be granted that must be printed and mailed to the VAAFM to receive recertification credit.

Links to specific courses can be found at **uvm.edu/extension/psep**



Practical Math for Pesticide Applicators

Adapted from a worksheet by Kathy Zuzke and Sam Bauer, University of Minnesota Extension

Conversion of units

Example: Convert 3 pt/ac to fl oz/1000ft2

Multiply across for converting units:

a.
$$\frac{3 \text{ pt}}{1 \text{ ac}} \times \frac{16 \text{ oz}}{1 \text{ pt}} = \frac{48 \text{ oz}}{1 \text{ ac}}$$

b.
$$\frac{48 \text{ oz}}{1 \text{ ac}} \times \frac{1 \text{ ac}}{43,560 \text{ft}^2} = \frac{48 \text{ oz}}{43,560 \text{ft}^2}$$

Cross multiply and divide for ratios:

c.
$$\frac{48 \text{ oz}}{43,560 \text{ft}^2} = \frac{\text{x oz}}{1000 \text{ft}^2}$$

x oz (43,560 ft²) = 48 oz (1000 ft²)
x = 48,000 / 43,560
x = 1.1 oz per 1000 ft²

Area Measures

1 square inch (in.²) = 6.45 cm² = 0.0069ft² 1 square foot (ft²) = 144 in.² = 0.111 yd² 1 square yard (yd²) = 9 ft² = 1,296 in.² 1 acre (ac) = 43,560 ft² = 4,840 yd² 1 square mile = 640 ac = 3,097,600 yd²

Cubic Measures

1 cubic inch (in.3) = 0.00058 ft3 = 0.0043 U.S. gal 1 cubic foot (ft3) = 0.037 yd3 = 7.48 U.S. gal 1 cubic foot (ft3) of water = 62.43 lb 1 cubic yard (yd3) = 27 ft3 = 202 U.S. gal

Weight Measures

1 ounce (oz) = 28.35 g = 0.0625 lb 1 pound (lb) = 16 oz = 453.59 g 1 ton (U.S.) = 2,000 lb = 32,000 oz

Volume Measures

1 fluid ounce (fl oz) = 0.00781 gal = 29.573 ml 1 cup (c) = 8 fl oz = 0.5 pt = 236.59 ml 1 pint (pt) U.S. = 16 fl oz = 2 c = 0.125 gal 1 quart (qt) = 2 pt = 4 c = 32 fl oz = 0.25 gal 1 gallon (gal) = 4 qt = 8 pt = 16 c = 128 fl oz

Linear Measures

1 inch (in.) = 25.4 mm = 2.54 cm = 0.083 ft 1 foot (ft) = 12 in. = 0.3333 yd = 30.48 cm 1 yard (yd) = 36 in. = 3 ft = 0.9144 m 1 mile (mi) = 5,280 ft = 1,760 yd

Geometric Calculations

Area of a rectangle = length (I) x width (w)



Area of a triangle = base (b) x height (h) / 2



Area of a circle = 3.14 x radius (r)2



Volume of a cylinder = 3.14 x r² x h



Volume of a hemisphere = (2/3) x 3.14 x r3



Volume of a cone = 3.14 x r2 x h / 3



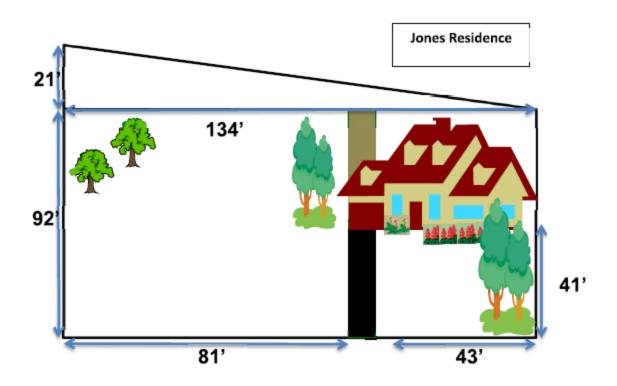
Home Study Quiz 1 – Navigating the Vermont Agency of Agriculture Pesticide Program and UVM Extension Pesticide Safety Education Program websites (Please keep answers brief; use additional paper as needed.) 1. What Vermont inserts to the Core Exam need to be downloaded to successfully prepare for the Exam? 2. Which certification would you need if you apply pesticides on property that you do not own but your employer does? HINT: Try out the PSEP flowchart! 3. What date in August 2019 are exams offered in St Albans? 4. How many pounds of atrazine were used on corn in 2005? 5. Using the Kelly Solutions link, list the name of the two pesticide products currently registered for use Hemp (fiber Crop) (foliar Treatment), including their formulations. 6. How many credits do you have in each of your categories and when do each of the categories expire? 7. What is the brand name of the pesticide with the EPA Registration number of 42750-281? What pesticide class is it? And what is the signal word, based on toxicity?

_	Which pesticide applicator meeting was offered 10/02/2018 in Montpelier? How many credits per category were available to attendees?				
9. How many PSI	EP online courses can you earn Vermont recertification credits for?				
10. What is the Vo website?	olume and Issue(s) of the oldest archived Pesticide Applicator Report or	the PSEP			
Mail the completed quiz to receive one (1) pesticide recertification credit. The following information is required.					
Name:					
Certificate #:	Please check: □Commercial □Pri □ Non-Commercial □Govern				
Street Address:					
City/State/Zip					
Company/Farm:					
Signature:	Date:				
Email address (optional):					
Mail to:	Vermont Agency of Agriculture, Food & Markets Attn: Anne Macmillan 116 State Street Montpelier, VT 05620-2901				

Home Study Quiz 2 - Practical Math for Pesticide Applicators

Adapted from a worksheet by Kathy Zuzke and Sam Bauer, University of Minnesota Extension (Please keep answers brief; use additional paper as needed.)

co	s April in Vermont and you've been asked to give a price quote for a fertilizer/preemergent herbicide mbo application at the Jones' residence (see map on next page). You need to produce a bid; here are the estions you need to answer:
1.	What is the total area to be treated?
2.	How many total pounds of product are required to treat the area at a rate of 2.8 lbs per 1000 square feet?
3.	What is the cost of one application to the Jones' turf if the product costs \$41 for a 50 lb bag?
4.	The label states that you can only apply 0.5 lb of active ingredient per acre per year. How many of the 2.8 lb per 1000 square feet applications can you make in one year?
to als	s now May and the Jones' are so pleased with their lawn that they want you to treat their crabapple trees prevent defoliation caused by apple scab fungus that they get every year. You have another client who o receives the same treatment on a 20' diameter canopy crabapple that you had to apply 6.1 gallons of ngicide mix to. The Jones' have two trees, each with a 10' diameter canopy.
1.	What is the total volume of the canopy of the large tree with a 20' diameter?
2.	What is the combined canopy volume of the Jones' two smaller trees?
3.	How much total fungicide mix do you need to treat both of the Jones' small trees?



Mail the completed quiz to receive one (1) pesticide recertification credit. The following information is required.

Name:	
Certificate #:	Please check: □Commercial □Private □ Non-Commercial □Government
Street Address:	
City/State/Zip	
Company/Farm:	
Signature:	Date:
Email address (optional):	
Mail to:	Vermont Agency of Agriculture, Food & Markets Attn: Anne Macmillan 116 State Street Montpelier, VT 05620-2901

The Pesticide Applicator Report – Spring 2019 Page 14 of 14