

FIELD ID NO: \_\_\_\_\_

### IR-4 FIELD DATA BOOK

#### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

##### A. EQUIPMENT

*INSTRUCTIONS: Complete a separate form for each piece of test substance application equipment used in the trial.*

EQUIPMENT USED FOR **APPLICATION NUMBER(S)** \_\_\_\_\_

EQUIPMENT IDENTIFIER<sup>1</sup> \_\_\_\_\_

<sup>1</sup>Each test substance application equipment must have a unique identifying name or code

APPLICATION EQUIPMENT TYPE (Check one)    WAIST-BELT \_\_\_\_\_    BACKPACK \_\_\_\_\_    GRANULAR \_\_\_\_\_

OTHER \_\_\_\_\_ (Describe) \_\_\_\_\_

PROPELLANT (Check one)    CO<sub>2</sub> \_\_\_\_\_    COMPRESSED AIR \_\_\_\_\_    PUMP \_\_\_\_\_

OTHER \_\_\_\_\_ (Describe) \_\_\_\_\_

TYPE OF APPLICATION (Check all that apply)

1)    FOLIAR \_\_\_\_\_    TO THE GROWING MEDIUM (SOIL) \_\_\_\_\_

2)    BROADCAST \_\_\_\_\_    DIRECTED \_\_\_\_\_

3)    OTHER \_\_\_\_\_ (Describe) \_\_\_\_\_

NUMBER OF PASSES THAT ARE NEEDED TO TREAT THE PLOT \_\_\_\_\_

NUMBER OF NOZZLES OR HOPPER OUTLETS USED			
MESH SIZE USED IN THE STRAINERS		SPACING BETWEEN NOZZLES OR HOPPER OUTLETS	
NOZZLE BRAND/TYPE/SIZE (e.g. T-JET 8004, even flat fan):			

TREATED AREA<sup>2</sup> \_\_\_\_\_

<sup>2</sup>Calculated width of nozzle discharge pattern (CWNDP) at proper boom height X length of plot sprayed or treated. For a broadcast application, CWNDP = (# of nozzles X nozzle spacing). For a banded application, CWNDP = # of nozzles X swath per nozzle. If application is foliar directed enter treated row width X # of rows X length of plot sprayed or treated; treated row width may differ from actual row width when the actual row width is wider or narrower than local commercial practices. In this circumstance, the application rate should be calculated using a local commercial row width, and an explanation should be included on this page or inserted behind this page. Contact the Study Director if guidance is needed.

DOES TREATED AREA = PLOT AREA (from Parts 5C and 5F)?    YES \_\_\_\_\_    NO \_\_\_\_\_

IF NO, PLEASE EXPLAIN: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Total number of pages in this section at initial pagination: \_\_\_\_

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FIELD ID NO: \_\_\_\_\_

IR-4 FIELD DATA BOOK

PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

B. DIAGRAM OF APPLICATION EQUIPMENT

EQUIPMENT USED FOR **APPLICATION NUMBER(S)** \_\_\_\_\_

*INSTRUCTIONS: Complete a separate form for **each piece** of test substance application equipment used in the trial. Sketch a diagram and/or provide clear photograph of application equipment. Include the relative location and size of the target crop and the nozzle/hopper outlet placement and application pattern in relation to crop, in the sketch or photograph. In addition, on the sketch or photograph assign each nozzle or hopper outlet a unique number.*

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PART 6 PAGE \_\_\_\_

Trial Year 2012

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FIELD ID NO: \_\_\_\_\_

### IR-4 FIELD DATA BOOK

#### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

##### C. DISCHARGE CALIBRATION FOR **APPLICATION NUMBER** \_\_\_\_\_

*INSTRUCTIONS: Complete a copy of this form (PHOTOCOPY IF NECESSARY) for additional times when a complete calibration or calibration- recheck of application equipment is required.*

EQUIPMENT IDENTIFIER \_\_\_\_\_

DISCHARGE CALIBRATION DATE \_\_\_\_\_ PERFORMED BY \_\_\_\_\_ (INITIALS)

APPROXIMATE TIME OF DAY THAT THE CALIBRATION WAS PERFORMED \_\_\_\_\_

PRESSURE OR OTHER STANDARD SETTING UTILIZED IN CALIBRATION \_\_\_\_\_

DISCHARGE UNITS MEASURED (e.g. ml, oz., grams) \_\_\_\_\_

INSTRUMENT USED TO MEASURE WATER (e.g. 100 ml graduated cylinder) \_\_\_\_\_

BRIEFLY DESCRIBE PROCEDURE USED TO CHECK DISCHARGE CALIBRATION \_\_\_\_\_

DISCHARGE CALIBRATION Record time applicator is allowed to discharge. Collect output from each nozzle or hopper. Record this value in "RUN" Row 1 under the appropriate outlet. Calculate the total and average discharge for all the nozzles/hoppers. Entry prompts have been provided for 2 additional discharge calibration runs. Calculate sums and averages of each nozzle/hopper outlet. Show all calculations.

RUN	TIME (sec)	Nozzle/hopper Outlet Number Along Boom (see equipment diagram for nozzle numbers)							
		1	2	3	4	5	6	Total	Avg.
1									
2									
3									
Total									
Avg.									

CALCULATIONS:

WAS THIS A RECHECK OF DISCHARGE CALIBRATION? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

IF YES, WERE RESULTS WITHIN 5% OF ORIGINAL CALIBRATION? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

**IMPORTANT:** An output consisting of an average of three runs must be used when calculating the sprayer output and amount of test substance to use. If this is a recheck (one run) then the results of the original calibration must be used. If the output result of the recheck is more than 5% different than the original calibration result, then two more runs are needed to produce a new, full calibration. The original calibration data, or a true copy, must be in this field data book.

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FIELD ID NO: \_\_\_\_\_

### IR-4 FIELD DATA BOOK

#### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

##### D. SPEED CALIBRATION FOR **APPLICATION NUMBER(S)** \_\_\_\_\_

*INSTRUCTIONS: Complete a separate form for additional times when a complete calibration or calibration- recheck of application equipment is required.*

EQUIPMENT IDENTIFIER \_\_\_\_\_

SPEED CALIBRATION DATE \_\_\_\_\_ PERFORMED BY \_\_\_\_\_ (INITIALS)

TERRAIN OF CALIBRATION TRACK (e.g. cement floor) \_\_\_\_\_

BRIEFLY DESCRIBE PROCEDURE USED FOR SPEED CALIBRATION \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SPEED CALIBRATION:** Calculate the speed of the application equipment. If appropriate, note the gear setting and /or RPM setting used in the speed calibration. Indicate the distance (in feet) of the track on which the application equipment was tested to determine speed (e.g. speed of application equipment tested for 100 ft.). The speed is calculated by dividing the length of test track (in feet or meters) by the time needed to cover that length (in seconds). Entry prompts have been provided for 2 additional runs. Show all calculations. **For studies beginning in 2011 or later, a speed recheck (one run) is required whenever an output recheck is performed.**

RUN	GEAR	RPM	Length of test track	TIME (sec)	CALCULATED SPEED (include units)	
1						
2						
3						
Total of test run times (sec)			Average time (sec)		Average speed	

CALCULATIONS:

WAS THIS A RECHECK OF SPEED CALIBRATION? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

IF YES, WERE RESULTS WITHIN 5% OF ORIGINAL CALIBRATION? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

*The original calibration data, or a true copy, must be in this field data book.*

**NOTE:** A target speed may be used for application calculations, rather than the mean of three runs, as long as the mean of the three runs in the speed calibration is within 5% of the target speed.

WAS THIS A CHECK OF A TARGET SPEED? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

IF YES, WERE RESULTS WITHIN 5% OF TARGET SPEED? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PART 6 PAGE \_\_\_\_\_

Trial Year 2012

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FIELD ID NO: \_\_\_\_\_  
IR-4 FIELD DATA BOOK

PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

E. DELIVERY RATE CALIBRATION FOR **APPLICATION NUMBER(S)** \_\_\_\_\_

*INSTRUCTIONS: Complete a separate form for each application, unless the same parameters are used-- you are using the same equipment, and have performed a recheck to confirm the result of the full calibration. Determine the rate of delivery from the application equipment. Briefly describe the procedure, including formulas used to determine delivery rate calibration. Show all calculations and units. Equations used in electronic (computer software) calculations in this trial must be transcribed or printed out and attached here. Computer-generated values (as opposed to those entered by the field cooperators) must be reviewed and clearly delineated by circling, initialing, and dating.*

PROCEDURE/FORMULA:

CALCULATIONS:

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PART 6 PAGE \_\_\_\_\_

Trial Year 2012

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FIELD ID NO: \_\_\_\_\_

## IR-4 FIELD DATA BOOK

### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

F. VOLUME, MIXING AND DILUTION CALCULATIONS FOR **APPLICATION NUMBER(S)** \_\_\_\_\_

*INSTRUCTIONS: Complete a separate form for each application, unless there are no changes in multiple applications. Show all calculations, formulas, and results below, define units of measure, and cite the initials of the person performing the calculations. Equations used in electronic (computer software) calculations in this trial must be transcribed or printed out and attached here. Computer-generated values (as opposed to those entered by the field cooperators) must be reviewed and clearly delineated by circling, initialing, and dating.*

DESCRIBE HOLDING AND TRANSPORT OF TEST SUBSTANCE FROM STORAGE AREA TO LOCATION OF TANK MIXING (E.g.: "Test substance held securely in an insulated cooler hand-carried during transport to greenhouse site" or "Tank mix prepared within walking distance of the chemical storage building")

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ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

PART 6 PAGE \_\_\_\_

Trial Year 2012

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FIELD ID NO: \_\_\_\_\_

IR-4 FIELD DATA BOOK

**PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS**

G. APPLICATION INFORMATION FOR **APPLICATION NUMBER** \_\_\_\_\_ **APPLICATION DATE** \_\_\_\_\_

HAS THE APPLICATION EQUIPMENT BEEN USED SINCE THE LAST CALIBRATION/RECHECK WAS PERFORMED? (Check one) YES \_\_\_\_\_ NO \_\_\_\_\_  
(If YES, then a recheck is needed.)

*INSTRUCTIONS: Complete a separate form for each application date. Complete one column for each treated plot (use the Treatment Number as indicated in the protocol). Provide the name of the test substance (common chemical name or chemical code number); the batch or lot number of the test substance; the approximate time the test substance was mixed with the carrier and the approximate time the mixture was applied to the plots, along with the initials of the person(s) mixing and spraying the tank mix; the unique name or code for the application equipment used to apply this treatment; the placement of the test substance (e.g. broadcast, foliar directed); the amount of carrier, formulated product and other additives in the mix; the distance (include units) of the nozzles above the canopy or ground (indicate which); the pressure in pounds per square inch at the boom; and the carrier ( normally water), its source (e.g. farm pond, city water), the pH of the carrier and its temperature, and the equipment used to measure the carrier pH.*

	TRT Number _____	TRT Number _____
NUMBER OF DAYS SINCE PREVIOUS APPLICATION		
TEST SUBSTANCE		
BATCH/LOT NUMBER		
TIME MIXED/INITIALS		
TIME APPLIED/INITIALS		
EQUIPMENT IDENTIFIER		
PLACEMENT OF TEST SUBSTANCE		
TANK MIX AMOUNTS		
- CARRIER (starting volume of water)		
-Volume of Water Removed (if applicable)		
- FORMULATED PRODUCT		
- ADDITIONAL ADDITIVES		
- TOTAL VOLUME OF TANK MIX		
NOZZLE DISTANCE FROM TARGET		
PSI AT BOOM		
CARRIER SOURCE/TYPE		
CARRIER pH/TEMPERATURE		
EQUIPMENT USED TO MEASURE pH		

WERE THE TREATED PLANTS MOVED TO ANOTHER ROOM OR PROTECTED AREA FOR SPRAYING? YES \_\_\_\_\_ NO \_\_\_\_\_

IF YES, IDENTIFY LOCATION: \_\_\_\_\_

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FIELD ID NO: \_\_\_\_\_

## IR-4 FIELD DATA BOOK

### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

H. ADDITIONAL INFORMATION FROM **APPLICATION NUMBER** \_\_\_\_\_

APPLICATION DATE \_\_\_\_\_ (Complete a separate form for each application date)

PROVIDE A BRIEF NARRATIVE SUMMARY OF THE APPLICATION

INCLUDE DETAILS ON HOW OTHER TRIAL PLOTS, IF ANY, WERE PROTECTED FROM CONTAMINATION

(E.g. "With greenhouse fans turned off, test substance was applied in two passes, one down each side of the row. The boom was held perpendicular to the floor and parallel to the foliage about 24" from the plants.")

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\_\_\_\_\_ NARRATIVE ENTERED BY \_\_\_\_\_ (Initials)

PLANT GROWTH & ENVIRONMENTAL DATA AT THE TIME OF APPLICATION	Enter data in this column
CROP HEIGHT (Measure or estimate crop height, include units of measurements)	
CROP GROWTH STAGE (e.g. seed, vegetative, bud, bloom, fruiting, #true leaves)	
CROP VIGOR (e.g. poor, fair, good, variable)*	
PLANT SURFACE MOISTURE (Check one)	<b>SATURATED</b> ___ <b>DAMP</b> ___ <b>DRY</b> ___ <b>NA</b> ___
ESTIMATED % OF GROWING MEDIUM AREA COVERED BY CROP CANOPY	
MEASURED AIR TEMPERATURE (Check F or C)	°F ___ °C ___
ESTIMATED % OF CLOUDS IN THE SKY (or indicate if shade cloth was in use)	
MEASURED RELATIVE HUMIDITY%	
TYPE OF SURFACE THAT APPLICATOR WALKED ON DURING APPLICATION	
DESCRIPTION OF GROWING MEDIUM TILTH (smooth, firm, packed, cloddy, etc.)	
ESTIMATE OF GROWING MEDIUM SURFACE MOISTURE (wet, moist, dry, etc.)	
GROWING MEDIUM TEMPERATURE (Check F or C)	°F ___ °C ___
DEPTH OF MEASUREMENT OF GR. MED. TEMPERATURE (Check INCHES or cm)	<b>INCHES</b> ___ <b>cm</b> ___

\*IF CROP VIGOR IS POOR OR VARIABLE, EXPLAIN: \_\_\_\_\_

BRIEFLY DESCRIBE PROCEDURE USED TO CLEAN APPLICATION EQUIPMENT \_\_\_\_\_

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\_\_\_\_\_ CLEANED BY \_\_\_\_\_ (Initials)

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FIELD ID NO: \_\_\_\_\_  
 IR-4 FIELD DATA BOOK

**PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS**

I. POST APPLICATION RATE CONFIRMATION FOR **APPLICATION NUMBER** \_\_\_\_\_

APPLICATION DATE \_\_\_\_\_ (COMPLETE A SEPARATE FORM FOR EACH APPLICATION DATE)

RECORD PASS TIME AND PASS DIRECTION - Complete the table by providing the time required to make each pass of the application equipment through the plot and direction of that pass (e.g. N > S, SW > NE, etc.).

PASS NUMBER	TREATMENT __		TREATMENT __		
	TIME	DIRECTION	PASS NUMBER	TIME	DIRECTION
1					
2					
3					
4					
5					
6					
TOTAL PASS TIME					

PASS TIMES RECORDED BY (INITIALS) \_\_\_\_\_ DISCHARGE RATE (ml/sec or g/sec): \_\_\_\_\_

ACTUAL AREA TREATED (swath width or treated row or bed width x # of passes x length of plot): \_\_\_\_\_

Note: Use bed width for plots with multi-row beds.

CALCULATION OF ACTUAL APPLICATION RATE - Using information such as total pass time, plot size, tank mix amounts, and discharge rate (average of 3 outputs) determine the actual amount of formulated test substance applied to treated plots. (If the protocol does not include a rate of formulated product, then the amount of active ingredient should be determined.) Convert this amount to the amount applied per acre (or hectare), and determine deviation from target application in the protocol, rounded to the nearest whole percent. Show all calculations and label all units. **It is not sufficient to merely compare the actual pass times to the "practice" pass times.** The example formulas listed at the bottom of 6J may be used to calculate the application rate. **Calculations may be entered on a separate page placed after this one, if there is not enough space below.**

WAS ACTUAL APPLICATION RATE WITHIN -5% TO +10% OF PROTOCOL RATE?

(Check one) YES \_\_\_\_\_ NO \_\_\_\_\_ IF NO, **Contact the Study Director immediately.**

ABOVE DATA ENTERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FIELD ID NO: \_\_\_\_\_

### IR-4 FIELD DATA BOOK

#### PART 6. APPLICATION RECORDS-GREENHOUSE TRIALS

##### J. POST TREATMENT RECORDS FOR **APPLICATION NUMBER** \_\_\_\_\_

APPLICATION DATE \_\_\_\_\_ (Complete a separate form for each application date)

Enter the requested information below for the first irrigation after each application, regardless of whether subsequent applications were made prior to the first irrigation. The irrigation data entered below should be transcribed from the data included in Part 9 unless otherwise indicated on this page. **“NONE BEFORE HARVEST” OR “NONE BEFORE SAMPLING” MAY BE ENTERED, IF APPLICABLE.**

TYPE OF IRRIGATION (e.g. overhead, trickle, flood)	
DATE OF FIRST IRRIGATION (Note the date of first irrigation after this application.)	
TIME AFTER APPLIC. THAT PLOTS WERE EXPOSED TO FIRST IRRIGATION (Check DAYS or HOURS) (Enter #hours if first irrigation was <u>on the date of application</u> .)	<b>DAYS</b> ____ <b>HOURS</b> ____
AMOUNT OF WATER (Check INCHES, mm, or mL)	<b>INCHES</b> ____ <b>mm</b> ____ <b>mL</b> ____
IRRIGATION INFORMATION RECORDED BY (Initials/date)	

If the data entered above differ from the irrigation data included in Part 9, explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Was There Any Visible Phytotoxicity Damage? (Check one) YES \_\_\_ NO \_\_\_ Recorded By \_\_\_\_\_ (Initials/date)

IF YES, PROVIDE BRIEF DESCRIPTION: \_\_\_\_\_

\_\_\_\_\_ PHYTOTOXICITY DESCRIBED BY \_\_\_\_\_ (Initials/date)

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EXAMPLE FORMULAS: The formulas below may be used to calculate the amount of test substance (TS) applied per acre as required in Part 6I. Other formulas may be used instead; however, it is not sufficient to merely compare the actual pass times to the “practice” pass times.

- 1) Total Pass Time x Discharge Rate/Nozzle x #Nozzles = Volume of Tank Mix applied to Plot
- 2) Volume of Tank Mix applied to Plot x  $\frac{\text{Amount of TS in Tank Mix}}{\text{Total Volume of Tank Mix}}$  = Amount of TS applied to Plot
- 3) Amount of TS applied to Plot x  $\frac{43,560 \text{ sq ft per acre}}{\text{Plot area treated in sq ft}}$  = Amount of TS applied per acre

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FIELD ID NO: \_\_\_\_\_  
**IR-4 FIELD DATA BOOK**

**PART 6. APPLICATION RECORDS**

**L.2. DIFFERENTIATION OF MULTIPLE TRIALS CONDUCTED BY THE SAME PERSON**

IF YOU CHECKED “YES” ON THE PREVIOUS PAGE

Check the options (in the third column) used to differentiate the trials that you are conducting in this study:

Set	Option	√	Description
1	A		Spray volume must vary by at least 25% of the lower volume (minimum 10 GPA difference) Example 1, Trial A has a volume of 20 GPA and Trial B has a volume $\geq$ 30 GPA Example 2, Trial A has a volume of 60 GPA and Trial B has a volume $\geq$ 75 GPA The trial with the lowest spray volume for the first application must remain the lowest for each application; the trial with the highest must remain the highest for each, and so on
	2	A	Different adjuvant class: Crop oil concentrate or Nonionic surfactant (non-silicone) or Silicone surfactant (Do not contradict instructions on the label of either the adjuvant or the test substance)
3	A		Different foliar application type: foliar directed or foliar broadcast
	B		Different types of application equipment be used in each trial (for example, tractor-pulled boom sprayer, tractor-pulled spreader, airblast sprayer, axial fan orchard sprayer, proptec sprayer, cannon mist sprayer, tower sprayer, over-row sprayer, tunnel sprayer, backpack sprayer, waist pack sprayer, hand gun, hand-held spreader, or shaker can)
	C		Different people make the applications, using hand-held equipment such as backpack sprayers, waist pack sprayers, hand guns, hand-held spreaders, or shaker cans
	D		Different spray droplet size (fine, medium, coarse, very coarse, or extra coarse) This may be accomplished by changing nozzles and/or by changing spray pressure Document in the Field Data Book the droplet size that results from the pressure and nozzles used in the trial (nozzle catalog may be used as a reference)
	E		Different granular application type: broadcast or banded (only if label supports both types)
	F		Different incorporation method for soil-applied test substance: mechanical or irrigation
	G		Different band width for soil applications: band width must vary by at least 50% of the lower width
4	A		Different crop variety (different size at maturity, rough vs. smooth surface, different amount of foliage shielding the commodity, etc.)—confirm with Study Director if this option will be chosen
	B		Different irrigation type (drip or furrow or sprinkler/over-the-top) (Irrigation must be applied at least once after each application, but over-the-top irrigation must not be applied within one hour of an application, and irrigation is not needed following the last application if samples are to be collected on the same day)
	C		Different planting arrangement for annual crops: single row beds or multi-row beds (two or more rows on each bed)
	D		For test substances that must be applied through drip irrigation: surface drip line or buried drip line
	E		One trial shall have trellised plants and the other shall not
	F		Different training system for fruit trees (for example, central leader or open center)
	G		Different maturity of trees or bushes in fruit and nut studies—young trees or bushes in one trial and mature trees or bushes in the other; minimum 5 year age difference
5	A		Trial sites must be separated by at least 20 miles (32 km)
	B		First application in each trial is separated by at least 30 days
	C		Different soil series, type, or texture (only in trials in which applications are made to the soil)

Provide any additional details that will further explain the options chosen (such as cultivar names, applicator names, etc.):

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