



CANADA
4-H Saskatchewan

Field Crops

Leader Guide

4-H Motto

'Learn To Do By Doing'

4-H Pledge

'I pledge

My Head to clearer thinking,

My Heart to greater loyalty,

My Hands to larger service,

My Health to better living,

For my Club, my community and my country'

4-H Grace

(Tune of Auld Lang Syne)

We thank thee, Lord, for blessings great

On this, our own fair land.

Teach us to serve thee joyfully,

With head, heart, health and hand

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4-H Saskatchewan

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General 4-H Information

Mission Saskatchewan 4-H is a project-based youth organization, devoted to strengthening the skills of responsible citizens. We focus on the growth and development of our members, leaders, volunteers and staff through our motto: *“Learn to do by doing”*.

Core Values We respect the importance of family and honour our 4-H traditions by upholding all of these core values:

- Honour and Integrity: Treating one another respectfully, fairly and justly.
- Reliability: Being dependable and responsible for our actions.
- Co-operation: Working as a team to achieve our goals.
- Fun: Creating positive and enjoyable experiences.

We do this within a safe, caring and positive environment.

4-H Pledge I Pledge:

My HEAD to clearer thinking
My HEART to greater loyalty
My HANDS to larger service, and
My HEALTH to better living, for
My club, my community and my country

4-H Motto Learn to do by doing.

4-H Grace *(Tune of “Auld Lang Syne”)*

We thank Thee Lord for blessings great
On this our own fair land
Teach us to serve Thee joyfully
With Head, Heart, Health and Hands

4-H Saskatchewan Although the 4-H program has its roots in rural Saskatchewan, the Saskatchewan 4-H Council serves all youth, 6 - 21 years of age. 4-H members develop leadership skills and responsible citizenship primarily through the completion of projects. In 4-H club work, members direct their own activities, learn to work effectively through their association with others and work in partnership with adults.

The 4-H program strives to encourage individual growth in young people by developing self-confidence, the ability to make wise decisions and responsible attitude toward community service. Creating a deeper

interest, understanding and appreciation of our natural environment are important objectives of the 4-H program development.

The Saskatchewan 4-H Council recognizes adult leadership and volunteerism as the foundation to its success in accomplishing its mission.

4-H Emblem

The national 4-H emblem is a green four-leaf clover with a letter 'H' inscribed on each leaf and the word 'Canada' forming the base. The four 'H's stand for Head, Heart, Health and Hands. These symbolize the ideals and objectives of this educational movement for young people through:

- Training the head to think, plan and reason.
- Training the heart to be kind, true and sympathetic.
- Training the hands to be useful, helpful and skilful.
- Promoting good health for effective home and community service.

The Canadian 4-H Council officially adopted this four-leaf clover in 1952. The four-leaf clover signifies "good luck" and "achievement".

The official colours in Canada are green and white. The white is for purity. Green is nature's most common colour and is symbolic of youth, life and growth.

Trademark and Copyright

Trademark and copyright protect the 4-H name, emblem, pledge and motto. This means they cannot be changed in any way. In order to preserve continuity of meaning and to engender public awareness, alterations, additions or deletions to the 4-H name, pledge, emblem and/or motto are strongly discouraged.



Project Completion Requirements

Welcome to the 4-H Field Crops Project

Thank you for giving your time to help 4-H members learn more about the Field Crops project. We hope that you have a positive experience as a 4-H leader and that you enjoy working with members to help them learn about the project, but also to help them enjoy being part of the 4-H program.

Project Completion Requirements

The project requirements are included in each member's manual. Each member should have a member's manual book and a record book.

To complete each year, members must:

- Complete four to six units in the manual
- Take part in an Achievement Day
- Complete a Record Book
- Participate in public speaking at the club level
- Follow the constitution/or policies of your club
- Have fun!

About the Field Crops Project Material

The member's project manual contains all levels of the Field Crops Project. The intent is for 4-H members to progress through the three levels at their own pace. The recommended age for levels for Level 1 is 9 to 12; Level 2, 13 to 15 and Level 3, 16 to 21 years of age.

About the Record Book

Members will be using the Field Crops Record Book. At the beginning of the year either individually or as a club, members will need to set prices for what it will cost to complete the project (a page is provided in the record book). Use these costs for calculating the costs of the project. There are spaces in the record book for additions such as, pictures, newspaper and/or magazine clippings.

Available Crop Projects

Members are required to complete a crop project in an area of at least 5 acres. What is grown and how large an area is used is dependent on the types of machinery available the best way to establish how big an area will be used is by measuring the width of the equipment that will be used. It is important that the area chosen will allow for the widest piece of equipment used.

Members may choose to use one corner of a field, a strip down one side of a field, a part of a field, or maybe a small field of their own. Depending on the equipment and how much space is available. They may want to grow more than one crop.

Members are not limited to the major crops grown in Saskatchewan. They can grow anything as a crop subject, provided they have the proper equipment to handle it. They might want to grow something from the following list:

Cereals	Oats, Barley, Wheat, Winter Wheat, Triticum, Rye
Oilseeds	Sunflower, Canola Flax
Pulses	Field Peas, Dry Beans, Chickpeas, Lentils
Forages	Alfalfa, Brome Grass, Timothy, Clover
Market Garden	Potatoes, Carrots, Peas, Pumpkins, Zucchini, Corn
Fruit	Raspberries, Strawberries, Saskatoons, Apples
Spices	Coriander, Caraway, Dill, Borage

Achievement Day Requirements

For Achievement Day you should:

- Display your completed record book
- Exhibit samples of your field crops project
- Take part in field crops judging class
- Complete a 4-H Questionnaire
- Participate in any other activities the club has planned

Other 4-H Opportunities

The crops project is only part of 4-H. Many activities are offered at club, district, regional and provincial levels or through your local agricultural society or exhibition association. They can take part in club fundraising, social events, meetings, public speaking, tours and many more activities. Contact your Regional 4-H Specialist for the activities happening in your Region or District.

Internet Reference Sites

Saskatchewan – www.agr.gov.sk.ca
 Alberta - www.agric.gov.ab.ca
 Saskatchewan - www.gov.mb.ca/agriculture

SOIL

Roll Call: Name something that is found in soil.

Possible answers include: minerals, organic matter, air, water, worms, decaying plant material, roots, dirt, insects, ants, microbes, nutrients, bacteria, rocks, sand, silt, clay, fungi, stubble, potassium, phosphorus, nitrogen, sulfur, salt, etc.

Objectives

Level 1:

- Learn the basic ingredients of soil, how it is made, and conditions that affect soil developments.
- Learn the basic types of soil in Saskatchewan, and identify the soil type of the local region.
- Identify the three main layers of soil.
- Learn how to take a soil sample, and identify the best locations to obtain representative samples from the field.

Level 2:

- Learn the basic nutrients that are found in soil.
- Identify items that a soil test will report on, and describe why each item of information is important to know.
- Interpret the results of a soil test, and describe their meaning to your cropping program, and present soil conditions.
- Learn the soil zones in Saskatchewan, and describe the characteristics, farming properties and variations with the soil type within local regions.
- Learn to evaluate the structure of soil.

Level 3:

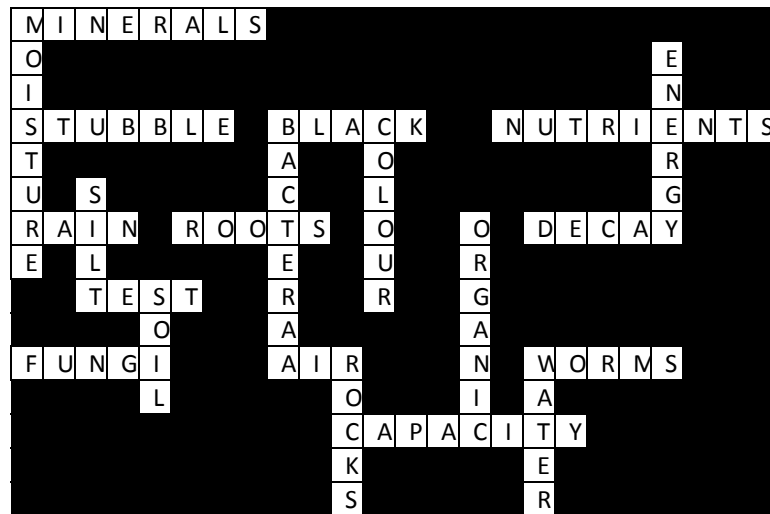
- Learn about soil erosion and conservation practices to reduce erosion.
- Learn what gives soil different textures and how to classify soil based on texture.
- Learn about soil water capacity.
- Learn about land reclamation, including cropping and drainage practices, which can reduce salinity problems.

There are several good references that you might use in this area:

- The Living Soil: A Renewable Resource
- Agronomy Handbook

Activities

Level 1: Crossword



Level 2: Test Your Knowledge

1. Which of the following is not a method of preventing and controlling saline soil?

b) Summerfallowing

***Summerfallowing** is a major cause of soil salinity. Under summerfallow, water usually used by plants moves below the root zone and dissolves salts from the sub soil. If the ground water flow moves the salt to the root zone in another area, crop yields and soil productivity are reduced.*

2. Which of the following practices help to add organic matter to soil? **d) All of the above**
All of these practices add organic matter to the soil.

3. Which of the following practices help in controlling wind erosion? **d) All of the above**

All of the above. By using several soil conservation practices, some protection will be provided, even if one of the individual elements should fail (i.e. after a drought, it is difficult to maintain enough cover to prevent wind erosion).

4. Which of the following statements is true? **a) K stands for potassium**

Level 2: Match the Statements

I. = e II. = f III. = d IV. = b V. = a VI. = c

TILLAGE

Roll Call: Name something involved in the preparation of a seedbed.

Cultivating, fertilizing, burning, residue management, moisture management, depth control, plowing, harrowing, picking rocks, drainage, spreading manure, temperature, etc.

Objectives

Level 1:

- Describe the purposes of tillage, and identify factors that make a productive seedbed.
- Describe how the tillage of crop residues contributes to proper soil management.
- Identify the common tillage equipment and their particular uses. Describe how they work.

Level 2:

- Describe the practice of conventional tillage, reduced tillage, minimum tillage, zero tillage and conservation tillage.
- Describe the practice of summerfallowing, and list advantages and disadvantages.
- Learn about the effects of tillage on soil texture.
- Learn how the previous crop grown and the crop to be grown affect tillage.
- Describe how different tillage techniques and implements affect soil quality and susceptibility to erosion.

Level 3:

- Select appropriate tillage equipment to meet specific cultivation requirements.
- Describe the performance of properly adjusted tillage equipment.
- Define side draft, and make adjustments to compensate for it.
- Explain how adjustments to an implement may vary according to soil and field conditions.
- Describe cultivation and cropping patterns that aid in proper soil management.

Activities

Level 1: Tillage Equipment Parts

- | | |
|--|----------------|
| A. Moldboard Plow | D. Disker |
| B. Wide Blade Cultivator | E. Vibra Shank |
| C. Chisel Plow (Heavy Duty Cultivator) | F. Harrows |

A, B, C and D are used for primary tillage. E and F are used for secondary tillage.

Level 2: Match the words...

- | | | |
|------|------|------|
| 1. g | 4. a | 7. c |
| 2. d | 5. h | 8. e |
| 3. f | 6. b | |

Level 2: Word Scramble

FIRMNESS
NO WEEDS

SOIL STRUCTURE
MOISTURE

DEPTH
TILLAGE

Things to Do

1. Visit an equipment dealer to look at different tillage equipment.
2. Tour a number of fields with different amounts of crop residue to manage, and different crops to be planted. Discuss tillage options for these variables.
3. Do a clinic on replacing cultivator shovels.

EQUIPMENT

Roll Call: Review how to locate and check lubrication points. Also, how to repair any that are not working.

Objectives

Level 1:

- Learn how to safely work around, and use farm equipment.
- Learn about the basic equipment used in field crops.
- Identify the pieces of equipment available to members' projects and how to properly grease equipment before field use.

Level 2:

- Learn the regular maintenance requirements of all of your farm equipment.
- Learn the rules for working on any farm equipment safely.
- Learn how to manage farm equipment, and make decisions about equipment purchases.
- Learn how to estimate and calculate equipment costs.

Level 3:

- Learn how to operate farm equipment properly.
- Learn how to establish the most efficient operating speed of farm equipment.
- Learn how to calculate the field capacity of farm equipment.
- Learn how to do regular maintenance of the engines of power equipment.

Activities

Level 1

Match the right answers...

- | | | |
|------|------|------|
| 1. e | 4. c | 7. a |
| 2. i | 5. h | 8. g |
| 3. d | 6. b | 9. f |

Level 2

Match the statements...

- | | | | |
|------|------|------|-------|
| 1. a | 4. h | 7. f | 10. i |
| 2. c | 5. b | 8. d | |
| 3. g | 6. e | 9. j | |

Level 3

Match the statements...

- | | | | |
|------|------|------|-------|
| 1. d | 4. e | 7. k | 10. a |
| 2. g | 5. j | 8. i | 11. f |
| 3. b | 6. c | 9. h | |

Things to Do

1. Tour each of the member's projects in the fall after harvest, or in the spring to take soil tests for each member.
2. As a club, take a soil test in a large field that requires a number of representative sights.
3. Explore the ditch banks for signs of soil erosion, and drifting topsoil into the ditches.
4. Take some samples of different types of soil and try to classify it.
5. Explore your area for salinity and ways of managing it.

Things to Do

1. Tour a fertilizer facility.
2. Invite a fertilizer representative to talk on fertilizer options.
3. Have a clinic on analyzing the soils test, and deciding what to fertilize.
4. Tour a field that has used legumes to supply nitrogen to the soil.
5. Do an experiment with some fertilized plants, and some plants not fertilized. Analyze the results as a club.

SEED

Roll Call: Name something that seeds provide us with to eat:

Possible answers: bread, breakfast cereal, cooking oil, pasta, medicine, coffee, cocoa, peanut butter, etc...

Objectives

Level 1:

- Identify the parts of the seed.
- Learn how a seed germinates, and how to test seeds for germination.
- Learn about the main types of field crops grown in Saskatchewan.
- Learn how to evaluate seed.

Level 2:

- Learn the classification of plants, and how monocots and dicots germinate and develop differently.
- Identify the main parts of a plant.
- Identify the major stages in the growth, and describe the physical characteristics of each stage.
- Identify factors that can affect the germination and emergence of seeds to help determine the ideal time for seeding.

Level 3:

- Identify factors involved in deciding the crop to be grown.
- Learn how to calibrate seed applicators.
- Identify and describe the various seed treatment alternatives.
- Identify and diagnose problems with germination.

Things To Do

1. During the winter, grow plants in pots, and watch the different stages or stagger planting to make a display of different stages.
2. Make a collection of pressed plants at different stages for achievement day.
3. Discuss and list all the different factors that can be used to tell varieties apart.
4. Collect pictures and seeds of as many different crops as possible. Include forage crops, pulse and special crops as well as cereal crops. Make a display.
5. Make plans to visit different crops at various stages of growth to observe the development of plants.

WEEDS

Roll Call: Name a way that weeds cost money.

1. *Weeds take water, food and sunshine away from crop plants and reduce the yield of crops.*
2. *If weeds are thick, the crop may have to be cut before it is mature.*
3. *The control and eradication of weeds costs millions of dollars yearly.*
4. *Weeds add work and expense to harvesting crops.*
5. *Seed crops containing weeds must go through additional expensive cleaning.*
6. *Weeds reduce the value of products on the market. Hay and feed should not be sold if they contain noxious weeds.*
7. *Some weeds are poisonous to livestock, and may kill or sicken them.*
8. *Some weeds replace range plants, and reduce the value and quality of pasture.*
9. *Some weeds affect human health and create medical costs.*
10. *Weeds may be hosts for plant diseases and insects that will spread to crop plants.*
11. *The value of farm property is reduced when serious weeds are present.*
12. *Weeds cause a fire hazard*
13. *Weeds impede the movement of water in drains and ditches.*
14. *Weeds detract from general appearances.*
15. *Weeds spoil recreational areas such as playgrounds and beaches.*

Objectives

Level 1:

- Learn the definition of a weed.
- Learn the classification of weeds.
- Learn how to use a weed identification guide.
- Identify ten weeds common to crops in Saskatchewan.

Level 2:

- Explore methods for managing weed problems.
- Identify stages of weed plant development.
- Define and identify noxious weeds.

Level 3:

1. Learn how to collect and correctly identify weeds.
2. Establish time lines and treatment options for various weeds.
3. Learn to manage multiple weed problems.

Things to Do

1. Invite a weed expert to help identify weeds that members have collected.
2. Tour a field and identify as many weeds as possible and discuss their management.
3. Have a clinic on noxious weed control.
4. Have a clinic on sprayer calibration.

INSECTS AND DISEASES

Roll Call: Name an insect or a disease that might affect the crop you are growing.

Answers will vary depending on the crop project that members have. Use the “Crop Protection Guide” available from Saskatchewan Agriculture and Food as a reference.

Objectives

Level 1:

- Identify five common diseases of crops.
- Identify five common pests of crops.
- Learn to identify the damage caused by diseases and pests.

Level 2:

- Learn the life cycle of common diseases and pests.
- Calculate the cost of damage caused by diseases and pests.
- Explore options for controlling common diseases and pests.

Level 3:

- Learn how to control diseases and pests through management.
- Learn the pesticide treadmill and how it can affect their pest management.
- Learn about resistance and how to avoid it.
- Understand the use of threshold population measurements.
- Recognize herbicide injury and how to prevent it.

Activities

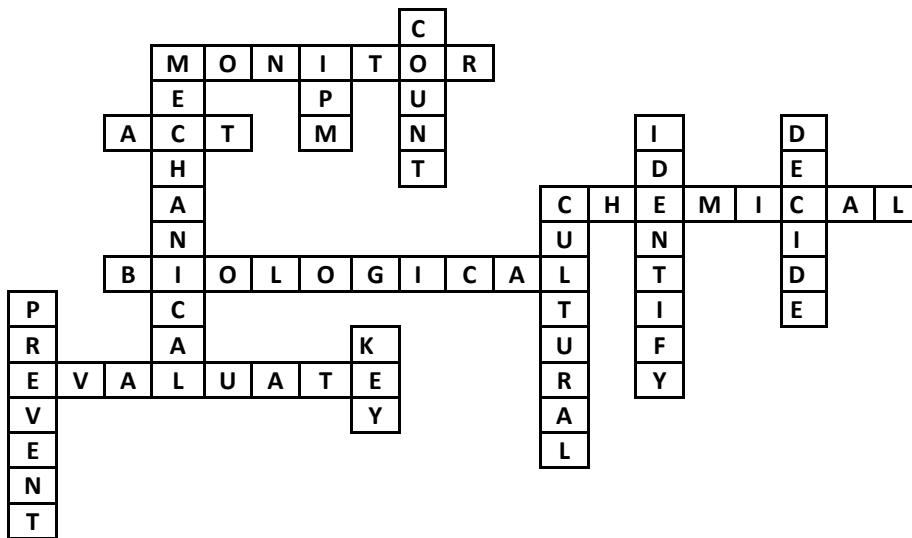
Level 1: Put the following in the correct order:

- | | | |
|------|------|------|
| A. 2 | D. 5 | F. 7 |
| B. 6 | E. 4 | G. 3 |
| C. 1 | | |

Level 2: Identify control methods as biological, cultural, mechanical or chemical.

- | | | |
|---------------|---------------|---------------|
| 1. Biological | 4. Chemical | 6. Mechanical |
| 2. Chemical | 5. Biological | 7. Cultural |
| 3. Cultural | | |

Level 2: Crossword Puzzle



Things to Do

1. Have a clinic on integrated pest management.
2. Invite an insect and disease specialist to help identify specimens that members collect.
3. Tour a field to identify any insects or diseases that may be present.
4. Have a clinic on selecting the appropriate chemical for the crop and pests to be managed.

PESTICIDES

Roll Call: Name something that should be done for the correct and safe handling of chemicals.

- *Store them in a locked shed away from children.*
- *Know the pesticide warning labels.*
- *Read the instructions carefully.*
- *Wear the appropriate safety equipment.*
- *Never smell chemicals.*
- *Never allow chemicals to come into contact with your skin.*
- *Stay upwind from chemicals.*
- *Do not mix near water sources.*
- *Haul water to the sprayer.*
- *Triple rinse containers*
- *Dispose of the chemical containers at the appropriate places, etc.*

Objectives

Level 1:

- Learn how to store chemicals safely.
- Learn the types of chemicals used and how they are classified.
- Learn how to properly dispose of chemical containers.

Level 2:

- Learn how to handle chemicals safely.
- Identify factors involved in choosing the most effective chemical to use.
- Learn about residues and crop resistance to chemicals.

Level 3:

- Compare effectiveness of different chemical treatment options.
- Learn to do a cost analysis of treatment options.
- Learn to calibrate chemical application rates.

Activities

Level 1: Protective Clothing

I=E; II=A; III=C; IV=B; V=D

Level 1: Why do herbicides affect weeds and not crop?

I=E; II=D; III=A; IV=G; V=B; VI=F; VII=C

Level 2: Match the statements

I=B; II=A; III=D; IV=F; V=G; VI=C VII=E

Level 3: Match the statements

I=C; II=B; III=F; IV=D; V=A; VI=E

Things to Do

1. Have a clinic on the proper protective equipment to wear when handling chemicals.
2. Visit a chemical manufacturer or distributor to learn about the development and testing of new chemicals.
3. Tour a field to identify herbicide effectiveness and any injury to the crop.
4. Have a clinic on selecting the appropriate chemical for the crop and pests to be managed.

HARVEST

Roll Call: Name something that happens at the busy time of harvest.

Swathing, preparing equipment, cleaning bins, hauling grain, selling grain, combining, drying grain, testing moisture, augering grain, etc.

Objectives

Level 1:

- Define a bushel and how it is measured.
- Describe various options for harvesting crops.
- Identify when a crop is ready to cut, and when harvesting it is appropriate.
- Identify ways to store crops and how to measure storage capacity.

Level 2:

- Identify alternative procedures for evaluating crop readiness, and describe their effectiveness.
- Identify factors to consider in determining the best height for crop cutting.
- Learn how to calculate yield and classification of grain quality.
- Identify factors involved in managing harvest.

Level 3:

- Learn how to prepare a swather and a combine for harvest.
- Learn how a combine operates and how to adjust the settings on a combine.
- Identify factors that may affect harvest loss.
- Learn how to manage the storage of harvest.

Activities

Level 1: Put in the correct order 8, 1, 6, 7, 2, 3, 5, 4

Things to Do

1. Visit a local grain elevator to see how grain is tested and handled.
2. Have a clinic on grain storage, bin cleaning, bin treating and bin sealing.
3. Take a probe of some grain bins to check for heating and moisture.
4. Visit a machinery dealer to see new combines and harvest equipment.
5. Invite a guest speaker to discuss how combines work.
6. Discuss yield and how to evaluate it.

MARKETING

Roll Call: Name a product that is grown, processed and sold in Saskatchewan. (Visiting a local grocery store and looking for products that say “Made in Saskatchewan” may be useful.)

Honey, alfalfa sprouts, sunflower seeds, sunflower oil, canola oil, margarine, milk, cheese, corn, carrots, potatoes, flour, wheat germ, rolled oats, granola, etc.

Objectives

Level 1:

- Become familiar with the basics of agricultural marketing.
- Options of crop insurance to secure the risk of investment.
- Understand supply and demand factors for agricultural products.
- Learn how cash grain prices are established.

Level 2:

- Write and understand the use of producer contracts.
- Explore local marketing options.
- Learn about hedging.
- Learn how commodity future markets work.

Level 3:

- Marketing strategies involving grain storage and transportation.
- Explore value added marketing options.
- Learn how to charge and analyze commodity markets.
- Learn how exchange rates and interest rates affect agricultural markets.

Activities

Level 1: Circling the correct response

1. LOW HIGH INCREASE 2. LOW RAISE INCREASE 3. HIGH NOTHING DECREASE

Level 2: Matching 1=g 2=e 3=d 4=a 5=b 6=c 7=f

Level 3: What type of contract would you use if...

- | | | |
|------------------------------|-------------------------------|-------------------|
| 1. Hedge | 4. Deferred Delivery Contract | 7. Basis Contract |
| 2. Deferred Pricing Contract | 5. Spot Sale | |
| 3. Open Basis Contract | 6. Floor Contract | |

Things to Do

1. Invite a local grain buyer to discuss marketing options.
2. As a club, chart the markets and discuss how to interpret market trends.
3. Invite a guest speaker to discuss global markets and how they affect local producers.
4. Set up some marketing scenarios and discuss options for each and how to make the marketing decisions.



CANADA
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