

# Watermelon Challenge Extension



"Watermelon is the chief of this world's luxuries, king by the grace of God over all the fruits of the earth. When one has tasted it, he knows what the angels eat." - Mark Twain

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## What Is the Alabama 4-H Watermelon Challenge?

The cumulative outcome of this project is for participants to grow and submit their heaviest and largest watermelon in the Alabama 4-H Watermelon Challenge.

To help achieve this goal, participants will learn about growing watermelons and then demonstrate what they have learned by cultivating and growing watermelons over a set time. This project will include youth learning about and applying a basic understanding of plant growth and development, plant nutrition, proper spacing, moisture needs, identification of pests and diseases, and control methods. Throughout the project, the participant will document all of this in a 4-H Watermelon Contest Journal. Once the watermelon is ripe, it will be measured and weighed at the county Extension office to be entered in the contest. Finally, participants can literally enjoy the fruits of their labor as they enjoy eating the watermelon with friends and family.

### Who Can Participate in the 4-H Watermelon Challenge?

Any Alabama youth age 9–18 who is enrolled in Alabama 4-H and signs up for the Watermelon Challenge Project is eligible to participate.

### **Important Dates**

**April 1:** All participants must be enrolled through 4-H Online in the Watermelon Challenge by April 1 so they will have time to receive their watermelon seeds. A \$5.00 program fee will be collected at registration.

**April 15–April 30:** All participants should plant their watermelon seeds during this time to allow for maturity of the fruit.

**April 15–July 31:** Participants must keep their watermelon journal and submit it with their entry to their county's 4-H Extension representative.

**July 31:** Deadline to bring all watermelon entries and completed journals to the county Extension office to be officially weighed and measured. Watermelons may be weighed earlier if they are ready to be harvested.

August 1: Deadline for county to submit all watermelon entries to the 4-H State Office. Specifics of whom to send them to will be communicated later, but before July. August 2: An announcement will be sent to all county offices with the final results of the heaviest and largest watermelon.

**August 5–10:** Ribbons and certificates will be mailed to winners and participants.



## History of the Watermelon

Watermelon (*Citrullus lanatus*) is a member of the Cucurbitaceae plant family. This family includes cucumbers, squash, pumpkin, gourds, honeydew, and muskmelon. The history of watermelon can be dated back about 5,000 years to southern Africa where it was a droughttolerant species used by indigenous people in the Kalahari Desert region as an important source of water as it is 92 percent water.

Over time, the watermelon made its way to ancient Egypt where it is believed that ancient plant breeders developed melons that were sweeter and, therefore, an enjoyable food. Historians know that watermelon was present in ancient Egypt as it is depicted in some tomb paintings.

The historical trail of the watermelon can be traced through medical books, recipe collections, and religious writings. For example, in the Holy Bible, Numbers 11:5, watermelon is referenced as one of the foods the Israelites longed for after leaving Egypt. The following timeline traces the movement of watermelon through the ages.

- Before and including the first century, Greeks and Romans thought the watermelon had medicinal uses.
- By the seventh century, watermelon was being grown in India.
- By the tenth century, watermelon had found its way to China.
- In the thirteenth century, the Moors introduced watermelon to the Iberian Peninsula, and from there it spread throughout southern Europe.
- By the seventeenth century, watermelon was being planted throughout Europe.
- European colonists as well as the slave trade from Africa introduced watermelon to the New World.
- Watermelon was found growing in Florida as early as 1576 and in Massachusetts by 1629.
- Thomas Jefferson grew watermelon at Monticello, and early in our nation's history, Native Americans were growing it from the Mississippi Valley south to Florida.

Throughout history, improving the taste (sweetness) of watermelon has been a goal of humankind. In the twentieth century, notable advancements occurred in the United States, particularly in the field of plant breeding. The United States Department of Agriculture (USDA) played a pivotal role by providing funding for a watermelon breeding project based at its facility in Charleston, South Carolina. In the 1950s, a major advancement took place in watermelon breeding with the introduction of seedless watermelons. In recent times, the goal has been to produce smaller melons that will easily fit in the refrigerator. Several of these smaller varieties have been developed. In addition, melons with yellow, orange, and white flesh have also been developed.

Watermelon used to be available only during the summer months, but with improvements in our transportation system and the fact that things are shipped around the world, we can now find it in local grocery stores year-round. Of course, watermelon is still one of the summer's favorite fruits. The Fourth of July and Labor Day holidays, as well as those summer family gatherings and picnics, would not be complete without a sweet and juicy watermelon.



### Getting Started as a Participant in the Alabama 4-H Watermelon Challenge

Contact your 4-H county Extension representative and sign up for the Watermelon Challenge on 4-H Online. **The deadline to register is April 1.** We want all our 4-H members to be successful, but since this is an agriculturally based project, it is important to understand that many factors such as weather events are impossible to predict and beyond human control. To help reduce the risk factors, the following information is being provided. In addition, we will offer helpful information to participants throughout the project. If participants have questions about growing watermelon at any time during the project, they may contact the Alabama Master Gardeners helpline at (1-877) 252-4769 or contact their county Extension office for assistance.

### Selecting and Getting Your Gardening Site Ready

 Light and Heat. Like all members of the Cucurbitaceae family, watermelons need full sun (6 to 8 hours) per day, so plant in a sunny location.
Watermelons also like warm temperatures, so do not plant too early in the spring. Daytime temperatures need to be in the 70s or above, with lows in the upper 60s or above at night. The soil temperature should be at least 70 degrees F.

In Alabama, you can start planting watermelon seeds in the southern part of the state in early April, while in the central and northern parts of the state, late April to early May is the time to plant. Since this is a competition, we suggest that everyone plant their seeds sometime between April 15 and April 30 so the watermelons have enough time to grow and mature by the weigh-in date of August 1.





- Special Equipment (optional). To help you monitor weather conditions throughout the project, place a rain gauge and thermometer (preferably a high and low thermometer) in the garden area near the watermelons. These instruments will be helpful throughout the project as you record temperatures and rainfall.
- Soil and Soil Preparation. The best soil for watermelons is a well-drained sandy loam. If you do not have this soil type and want to improve what you have, amend the soil with organic matter such as compost, topsoil, or composted manure. Loosen the soil to a depth of 6 inches to 8 inches in the area where the watermelon will be planted, working in the organic material. If you have heavy clay or compacted soil, you may want to consider constructing a raised bed that allows drainage.)

When you have amended and tilled the soil, use a tine rake to level the garden bed, or if you want to plant in hills, create 4-inch to 6-inch hills that are at least 12 inches in diameter. Now you are ready to plant.

Soil Test. Conducting a soil test on your garden site before planting is extremely important. By completing a soil test, you will know what nutrients you need to add to the soil. In addition, the soil test will let you know about the soil's pH (acidic/neutral/basic). Watermelons need a pH between 6.0 to 7.5 (slightly acidic to neutral). For information and instructions for soil testing, see "Submitting Samples for Soil Testing"

on the Alabama Extension website. When you have followed the instructions, return your sample to your county Extension office, and they will send it to the Auburn University Soil, Forage, and Water Testing Laboratory. You should receive the results in about 2 weeks after submitting the report. If you have trouble understanding the results, contact your county Extension office for assistance.



### Adding Nutrients (Fertilizer)

Watermelons are heavy feeders, so while preparing the soil for planting, it is a good time to work in any nutrients listed on your soil test, or if you didn't soil test, you may work in a complete fertilizer such as 10-10-10 or 13-13-13 at a rate of 3 pounds per 100 square feet of garden area. After the watermelons have started to grow, you may want to sidedress the plants with additional fertilizer when the vines begin to run and again when they start to bloom. This may be difficult if you are using plastic mulch (see Mulch), so you may want to use a diluted liquid fertilizer mix and water around the plant. Make sure you follow the instructions on the fertilizer to avoid problems.





## **Planting Your Watermelons**

**Space.** Depending on the variety, watermelons need a lot of space. Larger varieties need 24 to 30 square feet per plant. Since the large varieties that you will be growing in this contest send out vines, lateral space is vital. Space the rows 4 to 6 feet apart with 42 to 60 inches between plants in the row. Plant them so they won't crowd out other plants in the garden.  Planting Seeds. Since this contest is about growing the largest watermelon, we will provide the seeds to each participant so everyone will plant the same watermelon variety. The seeds for this project will be available to participants in May. The \$5.00 project fee is used to help cover the cost of the seeds.

For this project, seeds will be directly planted in the garden rather than starting them indoors. Plant seeds in a 4-inch to 6-inch hill about 12 inches in diameter. Sow four to five seeds per hill at a depth of 1 inch. After the seeds have germinated and developed their second set of true leaves, thin the seedlings to two plants per hill.





• Water. Keep the soil consistently moist but not wet for best plant growth. Monitoring rainfall and soil moisture is helpful for a successful watermelon crop. Therefore, it is suggested that you place a rain gauge in or near the garden. The rain gauge will help you meet your garden's water needs.

A garden needs at least 1 to 2 inches of rain a week depending on soil type, whether you use mulch, and hot weather conditions. Therefore, if you don't receive the needed precipitation, add more moisture through irrigation. When you need to add water, avoid wetting the leaves to help prevent fungal disease. To avoid wetting the leaves, place drip irrigation lines or a soaker hose near the base of your plants immediately after planting your watermelons. Doing this before the plants start growing or vining, makes you less likely to damage the plants while positioning the water lines. If you use an overhead watering system, apply the water early enough in the day so the moisture on the leaves evaporates before evening.

A simple soil moisture tester can be purchased to help you monitor the soil moisture around your watermelons, or you can dig a hole to a depth of at least 6 inches to see if there is enough moisture in your garden soil. Stay a couple of feet away from the plant when digging the moisture testing hole to avoid damaging the plant roots.

Mulch – Mulching can be done either when the seeds are planted or after the plants have started growing. Regardless of when you mulch, it will reduce the amount of watering that needs to be done, reduce the germination and growth of weeds, reduce the spread of some diseases, and help regulate soil temperature.

If you use black plastic sheeting (0.6 to 1.25 inches thick x 48 inches wide), follow these steps: Till a row about 6 feet wide and then mound the soil to the center of the row to a height of 4 to 6 inches. Position a drip irrigation line down the center of the row so that it follows the mound. (Some black plastic mulch has a drip line already built into the mulch.) Once the drip line is in position, unroll the plastic, covering the entire row. Flatten the plastic over the length of the row and push soil over the edges of the plastic to help anchor it in place. Measure down the center of the covered row and cut a 4- to 6-inch diameter hole every 5 to 6 feet down the center of the covered row, but be careful not to cut the water line. Plant four or five seeds in the exposed soil at a depth of 1 inch. When the seeds have germinated and have set a pair of true leaves, thin to two plants.

You can also mulch with organic matter such as leaves or straw. Till a row about 6 feet wide and then mound the soil to the center of the row to a height of 4 to 6 inches. Position a drip irrigation line or soaker hose down the center of the row so that it follows the mound. Plant four or five seeds in a hill every 5 to 6 feet. When the seeds have germinated and have a couple of sets of true leaves, thin the plants to two plants and place a 2 to 3-inch layer of the mulch around the plants and over the whole area between the watermelon hills.

Because the natural mulch is not a solid cover, some weeds will germinate and grow up through the mulch. Carefully hand pull these weeds and then add additional mulch to the area where the weeds had grown. One of the benefits of using natural mulch is that over time it will decompose, adding nutrients and organic material to the garden soil. In addition, at the end of the gardening season, unlike plastic, which must be picked up and placed in the trash, natural mulch can be left as a ground cover during the winter and then worked into the soil during the next gardening season.



### **Monitoring Your Watermelons**

When the watermelon plants germinate, participants must monitor for weeds, insects and other pests, and plant diseases. If any of these are left unchecked, your watermelons could be negatively affected. Weeds. A weed is any unwanted plant that conflicts with what you want to grow. Therefore, any plant besides a watermelon is considered a weed for this project. Weeds compete with your watermelon for nutrients and space, possibly limiting both your yield and the quality of the fruit. Some weed species may attract insect pests that feed on your watermelon plants.

Using mulch will help block many weeds from germinating and make it easier to pull those that grow. Remove the weeds that sprout while they are small so there is less chance of damaging the watermelon's roots during removal. Avoid stepping on or damaging the vines while removing the weeds. If you keep on top of the weed control, you will not need to use any herbicide.

**Insects and Other Pests.** Several species of insects are attracted to watermelons and other members of the cucurbit family. The best thing to do is to monitor the garden a couple of times a week and watch for pests or the damage they cause. Once a pest or the damage it causes is noticed, try to identify the culprit and use best management practices to address the issue.

The following photos are of insect pests that may feed on your watermelon. For control ideas and treatment methods, contact your Extension regional home grounds specialist.



#### Striped Cucumber and Spotted Cucumber Beetle

(Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org)



Banded Cucumber Beetle

(Photo credit: Clemson University - USDA Cooperative Slide Series, Bugwood.org)



#### Squash Beetle

(Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org)



### Squash Beetle Eggs

(Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org)



### Spider Mite Damage

(Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org)



### Aphids

(Photo credit: Alton N. Sparks, Jr., University of Georgia, Bugwood.org



Squash Bugs (Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org)



Squash Bug Eggs (Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org)

In addition to insect pests, animals such as rabbits, squirrels, deer, and coyote may also eat the plant and fruit. The best deterrent for these animals is to fence in the garden.



**Diseases.** Diseases affecting watermelon are caused by microorganisms (pathogens), including fungi, bacteria, viruses, and nematodes. To help reduce these diseases, follow these strategies:

- Crop rotation: Some fungi, bacteria, and nematodes that cause soilborne and foliar disease survive in the soil and crop debris. To avoid this carryover, use a 3- to 4-year rotation of growing noncucurbit plants before growing a cucurbit family crop again.
- **Garden site:** As mentioned earlier in Selecting a Garden Site, well-drained soil with the right pH will help plants avoid root, crown, and fruit rots.
- Sanitation: Clean up the garden at the end of the garden season. Crop debris can harbor plant pathogens. Either remove the debris and dispose of it in the trash or work it into the soil so it will quickly decompose.
- Disease-resistant varieties: Selecting the best watermelon variety is important. One way to help avoid disease problems is to select diseaseresistant watermelon varieties.
- Irrigation: Avoid frequent watering with small amounts of water as one deep watering per week of at least an inch is better than several shallow waterings. Avoid overhead sprinklers as these wet the foliage and splash pathogens from the soil onto the leaves. Use drip irrigation when possible.



- Chemical control: You may need to spray the watermelon with fungicides or bactericides to help control diseases. Guidance will be provided during the project, or you may contact your Extension regional home grounds specialist.
- Monitoring/scouting: Closely inspect your garden at least twice a week for signs of disease. By keeping an eye on the garden, you will be able to detect a problem early, allowing you to start a management practice before the problem gets out of control.



### Tips for Growing the Largest Watermelon

The following is a list of things you can do to help you accomplish your goal of growing the largest watermelon.

- If possible, select a gardening site with lots of sunlight, sandy-loam soil, and a pH of 6.0–7.5.
- Get a soil test.
- Plant melons only after the soil temperature stays above 65 degrees F and the air temperature is in the upper 60s at night and upper 70s during the day.
- Give the plants plenty of space by placing rows 4 to 6 feet apart with 42 to 60 inches between hills.
- Provide 1 to 2 inches of water per week using drip irrigation, if possible.
- Provide the plant with a well-balanced fertilizer at planting and then sidedress again when the plant starts to vine and when flowering starts.
- Monitor the garden at least twice a week for signs of pests and disease.
- Mulch the garden to help control weeds and hold moisture.
- Limit the number of fruits on a plant to one or two if you want larger fruit. This means you will have to remove the unwanted melons.
- Apply insecticides and fungicides as needed.
- Provide shade cover directly over the fruit to avoid sunburn, leaving the leaves uncovered so they can feed the plant and melon through photosynthesis.
- Place something under the melon to help keep it off the ground so insects and other critters don't burrow into the underside.



### Harvesting Your Watermelon

People use several methods to determine if a watermelon is ready for harvest. The following are some of the different ways to determine ripeness: when the "belly patch," the part of the rind that rests on the ground, turns from white to a creamy yellow; when the tendril across from where the melon is attached to the vine turns from green to brown; and when you tap the watermelon (thumping test) and listen for a dull thump rather than a metallic sound. All these ways seem to work, but use the one that you feel is most reliable.

Ultimately, the most important ripeness test is when the watermelon is harvested, cut, and tasted. Only then do you know if it is truly ripe and sweet.

### Watermelon Garden Preparation

Date \_\_\_\_\_ Time Spent in Garden \_\_\_\_\_

Air Temp. \_\_\_\_\_ Soil Temp. \_\_\_\_\_

Did you soil test?

Soil moisture (check one of the following):

\_\_\_\_ Moisture visible at surface without moving soil.

- \_\_\_\_ Visible signs of moisture in top 3 inches of soil.
- \_\_\_ No visible signs of moisture in top 6 inches of soil.

Describe what you did to prepare the garden site.

Document your activity by adding photos below.

Date \_\_\_\_\_ Time Spent in Garden \_\_\_\_\_

Variety of Watermelon Planted:

Number of Hills Planted \_\_\_\_\_

Number of Seeds per Hill \_\_\_\_\_

Was moisture present when you planted the seeds?

How are you watering?

Describe your activity and observations:

Document your activity by adding photos below.

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Date \_\_\_\_\_ How many hours did you spend in the garden this week? \_\_\_\_\_

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Record average high and low temperature for each week on the Temperature Weather Chart on page 29.

**Precipitation:** Add together the rainfall for the week and record it here. \_\_\_\_\_

Record the total for the week on the Precipitation Weather Chart on page 29.

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Record your garden activity and observations for the week below:

### Watermelon Weekly Entry

Date \_\_\_\_\_ How many hours did you spend in the garden this week? \_\_\_\_\_

### Weather Conditions

**Temperature:** Record the high/low temperature each day in the spaces below and then find the average for the week.

Day of Week	High Temperature	Low Temperature
Sunday	-	
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Total Temperatures		
Average (Total/Number of Days)		

Record average high and low temperature for each week on the Temperature Weather Chart on on page 29.

Precipitation: Add together the rainfall for the week and record it here. \_\_\_\_\_

Record the total for the week on the Precipitation Weather Chart on page 29.

I irrigated this week. Yes No How many inches of water did you add through irrigation this week? \_\_\_\_\_

Record this on the Precipitation Chart.

Record your garden activity and observations for the week below:

### Watermelon Weekly Entry

Date \_\_\_\_\_ How many hours did you spend in the garden this week? \_\_\_\_\_

### Weather Conditions

**Temperature:** Record the high/low temperature each day in the spaces below and then find the average for the week.

Day	High	Low
of Week	Temperature	Temperature
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Total Temperatures		
Average (Total/Number of Days)		
Record average high and low temperature for each		
week on the Temperature Weather Chart on page 29.		
Precipitation: Add together the rainfall for the week		

and record it here. \_\_\_\_\_

Record the total for the week on the Precipitation Weather Chart on page 29.

I irrigated this week. Yes No How many inches of water did you add through irrigation this week? \_\_\_\_\_

Record this on the Precipitation Chart.

Record your garden activity and observations for the week below:

### Watermelon Weekly Entry

Date \_\_\_\_\_ How many hours did you spend in the garden this week? \_\_\_\_\_

### Weather Conditions

**Temperature:** Record the high/low temperature each day in the spaces below and then find the average for the week.

Day of Week	High Temperature	Low Temperature
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Total Temperatures		
Average (Total/Number of Days)		

Record average high and low temperature for each week on the Temperature Weather Chart on page 29.

Precipitation: Add together the rainfall for the week and record it here. \_\_\_\_\_

Record the total for the week on the Precipitation Weather Chart on page 29.

I irrigated this week. Yes No How many inches of water did you add through irrigation this week? \_\_\_\_\_

Record this on the Precipitation Chart.

Record your garden activity and observations for the week below:

### Weather Charts: Average Temperature Each Week

**Record data as a line graph:** Use two different colors of colored pencils to graph the weekly high (H) and low (L) average temperatures on the chart below. To find average temperature, add each week's low temperature together and divide by the number of temperatures you recorded that week. This is your average. Do the same with the high temperatures. Example: 65+70+71+75+73+72+70= 496/7=70.86 (average low temperature)



### Weather Charts: Total Precipitation & Irrigated Water Each Week

**Record data as a bar graph:** Use two different colors of colored pencils to graph the weekly moisture through precipitation (P) and irrigation (I) on the chart below.



Alabama 4-H Grows Watermelon Challenge 29

### Alabama 4-H Watermelon Challenge Entry Form

Only youth registered for the Watermelon Challenge through 4-H Online may submit entries in this project. Bring this form along with your Watermelon Journal to your county Extension office when you weigh in your watermelon entry.

Particip	ants Name:		Weigh-in Date	::
County	where watermelon w	as grown:		
To be o	fficially entered, the e	entry must be weighed a	nd measured under t	the supervision of a
4-H/Ext	tension representative	e from the county in whic	ch the watermelon w	as grown.
•	What is the diamete	er around the watermelor	n at its thickest point?	? Inches
• What is the length of the watermelon from end to end			nd to end in a straigl	ht line?
	Inches			
•	What is the weight o	of the watermelon?	pounds	and ounces.
			100 pour	nds 10 ounces
•	What is the combine	ed weight of your three l	argest watermelons?	
		_ + +		=
	Watermelon 1 Weight	Watermelon 2 Weight	Watermelon 3 Weight	Combined Weight of all 3 Watermelor

By submitting and signing this form, I verify that I have grown the watermelons that were weighed and submitted as an entry in the Alabama 4-H Watermelon Challenge.

Signature of Participating 4-H Youth

As the 4-H/Extension representative, I witnessed the measuring and weighing of the above watermelon and verify that the information recorded above is accurate.

Signature of 4-H/Extension Representative

Date of Entry







For more information, contact your county Extension office. Visit www.aces.edu/directory.

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