# NSDAR Educational Resources Committee

Who was Flora Wambaugh Patterson?
Unlocking Women's History Through Mycology

**Contributor:** Aryssa Damron **Grade Level:** 9th – 12th

1. **Identify the standards to be addressed:**

   CCSS.ELA-LITERACY.RI.9-10.1
   CCSS.ELA-LITERACY.RI.9-10.7
   CCSS.ELA-LITERACY.RH.9-10.9

2. **Statement of the objective and lesson outcomes:**

   This lesson plan is best for high school students in a science or social studies class, ideally both, who can synthesize biographic information, engage with primary sources and employ research techniques. Students participating in this lesson will learn about Flora Wambaugh Patteson using primary sources, engage in basic research techniques, and answer comprehension questions that help build reading fluency and confidence. They will learn basic terms associated with mycology and supplement existing Women's History content.

   By using primary, secondary, and collaborative sources, students will be able to work individually and in small groups to evaluate sources, engage in discussion of these sources, and relate them to other sources they may have studied in class.

   The objective of this lesson plan is to provide primary and secondary source materials related to history and science that can further illuminate modern events related to climate change, women's history, and DC events.

3. **Materials, resources, and technology to be used by teacher/students**:

   1. The attached informational packet and Internet Access.

4. **Introduction of the topic**:

   https://www.nps.gov/subjects/cherryblossom/history-of-the-cherry-trees.htm. Talk to students about cherry blossom trees--look at pictures of them. What do we already know about them? What can we easily learn about them in the media?

5. **Procedure for instruction**:

   Proceed through the three "documents" in the attached packet in order. We recommend doing this in small groups or perhaps dividing the group into thirds and having each group work on one document and then share out with the group to create a holistic overview of the issue and tie them together.

   Group 1: Read the biography of Flora Patterson on Page 2 and answer the comprehension questions about her and her work. This includes comprehension questions based on the text as well as prompts for further research that can be expanded upon, such as researching recent events related to the cherry blossom trees.

   Group 2: read Document 2 on page 3.. This is a letter Flora herself wrote to the USDA. Think about it as a primary document and answer the comprehension question. This includes interrogating whether it is a primary

or secondary source, some comprehension questions, and an invitation to tie this to the other reading of documents.

Group 3: read Document 3: a newspaper article about the trees. Answer the comprehension questions, which includes a more modern look at the cherry trees, a chance for further research, and imaginative work about a primary source that might support this secondary source.

During these small groups, the teacher should float to do spot checks of student understanding, check in with students, and offer guidance.

6. **Lesson Closure**

Close the lesson with the whole group by watching this Youtube video about Stumpy. How does this relate to Flora Pattern? Discuss how it relates or builds upon what you learned about Flora and the history of the cherry trees. Video: https://www.youtube.com/watch?v=D3jM1fsdvVE

7. **Assessment of Understanding:**

Assess student understanding by having them self-grade their comprehension questions for each

# Who was Flora Wambaugh Patterson? Unlocking Women's History Through Mycology

This lesson plan is best for high school students in a science or social studies class, ideally both, who can synthesize biographic information, engage with primary sources and employ research techniques.

**Materials Needed: This information packet as well as Internet access. It is recommended that you pre-read this article from the National Park Service as a background refresher: www.nps.gov/subjects/cherryblossom/history-of-the-cherry-trees.htm**

This lesson plan was created by the District of Columbia Daughters of the American Revolution in support of the administration of Beth Gable Hicks, who chose a cherry blossom pin to represent ties of friendship in the District and honoring Flora Wambaugh Patterson, an early member of the Constitution Chapter who played a pivotal part in the success of the cherry blossoms in DC. This is part of her story.

**This lesson plan should be planned to take approximately 75 minutes of instructional and research time for the average student to complete, but could easily become a more robust project for interested parties.**

# Document 1: Meet Flora

Read the following biographic piece online about Flora: https://www.apsnet.org/edcenter/apsnetfeatures/Pages/FloraPatterson.aspx. A section is pictured below. Answer the questions that follow.

## Plant Quarantine Work - New Diseases Arriving

One of Patterson's major responsibilities was the inspection of imported commodities for non-native, potentially invasive fungal pathogens. In 1906 a formal plant inspection program was initiated in which Patterson and her three employees were charged with detecting and identifying fungal diseases. Many unusual and unknown fungi were found and the mycologists worked tirelessly on the identification of these fungi as well as methods for their eradication. In this role Patterson was involved in several of the major fungal pandemics in the U.S. including the chestnut blight disease that altered the landscape of the eastern deciduous forests (see APS*net* Feature on chestnut blight). Among their interceptions was the dangerous potato wart disease caused by *Synchytrium endobioticum*, which they identified for the first time on potatoes for import into the U.S. This fungus remains the subject of considerable plant quarantine activity.

One of the more memorable episodes in her plant quarantine activities concerned the Japanese flowering cherry trees that were given to the United States as a present from the Mayor of Tokyo. Upon the arrival of 2,000 highly prized plants in January, 1910, the exotic trees were found to be infected with numerous fungi and insects (8). Realizing the potential danger these organisms posed to U.S. agriculture, Patterson and her colleagues including Nathan Cobb, a nematologist, and J.G. Sanders, an entomologist, took a politically unpopular position and advised that the cherry trees be destroyed. In a letter (Fig. 3) written by Patterson about the infected trees, she noted that in addition to crown gall "present on 45% of the trees ... the girdling of five trees apparently has resulted from the attack of a *Pestalozzia* sp...It is impossible to decide with the limited time available for research if the *Pestalozzia* is of an indigenous species." Despite the passing of almost a century, members of the genus *Pestalozzia* (now spelled *Pestalotia*) and its segregate genera are still very difficult to identify to species. The unidentified specimen of *Pestalotia* sp. from the first set of cherry trees still resides in the U.S. National Fungus Collections (Fig. 4). The three USDA scientists who inspected the first shipment of Japanese cherry trees were able to convince the U.S. government of the danger posed by these exotic organisms. The entire lot of trees was burned in a bonfire on the Mall in Washington, D.C. (Figs. 5 and 6). A carefully worded, diplomatic letter was composed and sent to Japan. Eventually a second set of thoroughly fumigated trees was shipped and arrived free of insects and diseases. These new cherry trees still adorn the Tidal Basin in downtown Washington, DC (Fig. 7).

1. Is this a primary. secondary, or tertiary source? Why?
2. Why was Flora's job in inspection so important? Can you imagine other things she might have had to inspect?
3. What are 3 words in this biography you might need to look up the meaning of?
4. Research the 2023 Cherry Blossom Festival in Washington, D.C. What can you find out? When did it happen? What factors impact when the festival happens?
5. Can you find anything on the US Department of Agriculture website about Flora Wambaugh Patterson? Were you surprised--why or why not?

# Document 2: USDA Letter

Read the following letter that Flora wrote to Mr. David Fairchild about the cherry trees and answer the following questions.

Source:apsnet.org/edcenter/apsnetfeatures/Article%20Images/Patterson_Fig03.gif

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry

Washington, January 19, 1910

Pathological
collections
Mycological exchange.
Inspection work.

Mr. David Fairchild,

Agricultural Explorer,

In charge of Seed and Plant Introduction.

Dear Mr. Fairchild:

The inspection of the large consignment of Japanese cherry trees presented by the Japanese Government has been completed.

Crown gall is present on 45% of the trees and the girdling of five trees apparently has resulted from the attack of a *Pestalozzia* sp. Crown gall is already widely distributed in this country and its importation in this case may not be of any considerable economic importance. It is impossible to decide with the limited time available for research if the Pestalozzia is of an indigenous species.

Fungous mycelium was pretty generally present on the roots—it appeared to be due to conditions of packing rather than a true root disease. Cultural experiments were started to substantiate this belief.

Yours very truly,

FLORA PATTERSON

Mycologist in Charge.

O.K.,

A=A.V.

1. Is this a primary or secondary source? Why?
2. What can you infer that Mr. Fairchild's job or role in the trees is?
3. What are 3 words in this letter you might need to look up the meaning of?
4. Search for the word Pestalozzia online. What are the first three things that appear? Do any of them relate to the cherry trees?
5. Why do you think this letter is still available for you to read today?

# Document 3: Washingtonian Article

Read the article on the history of the Cherry Blossom Festivals in DC and answer the following questions:
https://www.washingtonian.com/2018/03/18/surprisingly-calamitous-history-dcs-cherry-blossoms/

1. Who is Eliza Scidmore? Why is she important? Why do you think more people don't know about her?
2. Flora Patterson is not explicitly mentioned in this article, but her work is. How many trees were destroyed? Why were they destroyed versus treated?
3. What are 2 other examples of ways that the cherry trees have been in danger or impacted by human events, worldwide issues, etc?
4. What would be one primary source (real or imagined) that might strengthen this article?
5. Research when the cherry blossom trees are expected to bloom this year. Why is this such an important thing to track?