

# Mid-Atlantic Regional Seed Bank



## NATIVE ASH SEED COLLECTION PROTOCOL

# Collection Strategy and Protocol





# Protocol

Kept separate by mother tree - one bag per tree

One standard paper grocery bag (12x7x17) filled with seeds 2-12 inches in depth

Can remain in clusters but should be removed from tree branch

Data sheet must be filled out fully

A twig sample must be placed in the bag (6in in length)

Two photos must be taken

**Ash Seed Collection Data Sheet**

Date of collection: \_\_\_\_\_

Collector's name: \_\_\_\_\_

Species (check one):  Black  Blue  Green  Pumpkin  White

<b>Seed Lot Identification</b>	
Collector's ID number: _____	Seed lot number: _____

State _____	County _____
GPS Coordinates: lat _____ long _____	elevation _____ meters
Decimal Degree Format	Accuracy + _____ ft

Number of ash trees within 20 to 40 feet of this tree:  0,  1,  2 to 4,  5 or more

Number of other trees that are not ash within 100 feet this tree:  0,  1,  2,  4 or more

Distance between this tree and nearest other ash tree from which seeds were collected.  
 100 feet (minimum),  200 feet,  more than 200 feet

Soil:  Rocky  Gravel  Sand  Loam  Clay

Site type:  upland  wetland  aquatic.

**Complete only for upland sites**

Topography:  Flat  Slope (Aspect:  N  S  E  W)

**Directions to the site if not using GPS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Twig sample has been put in bag  Trunk and whole tree photos have been taken

# Collecting Seed



- Identify Species
- Locating and monitoring trees
- Seed maturity
- Insect Damage
- Data Sheet
- Picking Seeds
- Post harvest handling

# Identify Species



- Opposite branching and pinnately compound leaves
- Use multiple characteristics – leaves, twigs, seeds, and location/habitat
- Green ash and black ash are found on wetter sites with black ash sometimes generally growing in swamps.
  - Green ash might be found near black ash.
- White ash is an upland species growing on moist but more well drained sites.
  - Green ash might grow close to white ash.
  - White ash and black ash will not normally grow near each other in nature.



White ash showing opposite arrangement of branches and leaves.



This is the underside of the leaves. White ash is lighter colored beneath than is green ash.





A black ash leaf. The leaflets of black ash are attached very closely to the rachis. They are **sessile** on the **rachis**.

Another black ash showing leaflets that were more pointed (acute) than the leaf in the previous slide. Species characteristics can be variable.







Terminal bud

Lateral bud

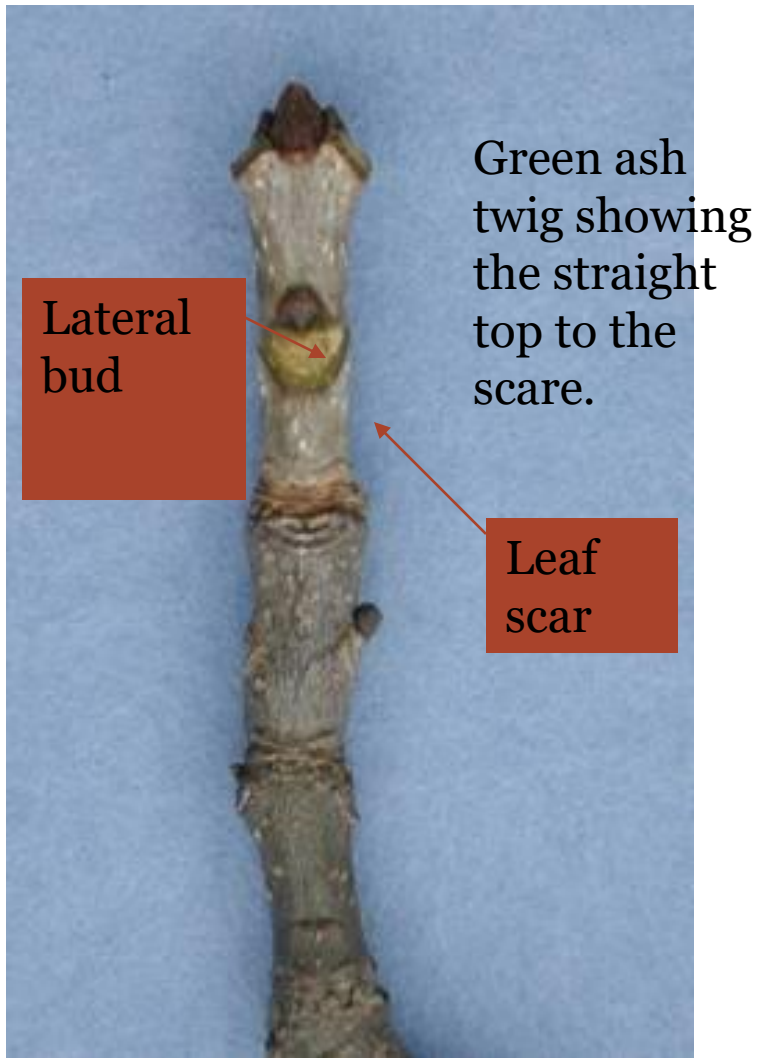
leaf scar



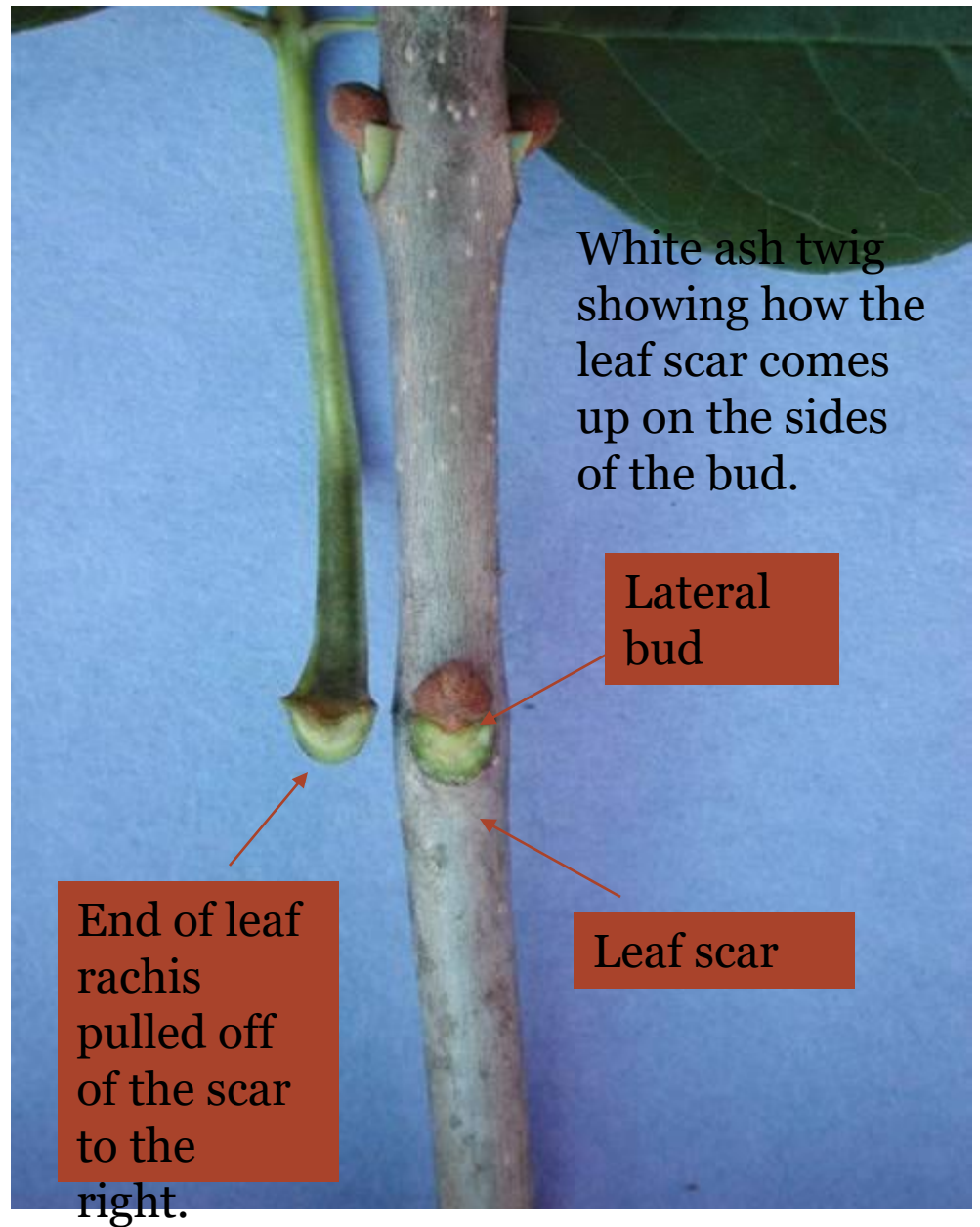
Black ash twig

Green ash twig.

The tip of a black ash twig has parallel sides, while a green ash flares at the tip.



The upper edge of the leaf scar on green ash is typically straight across the top and does not wrap around the bud.



# Seeds



Seeds of green ash are usually born in tighter panicles than white ash. The seeds are also narrower and more pointed.

White ash seeds are usually born in looser panicles than are green ash. The seeds generally are not as pointed and sharp as green ash are.





# Comparison of black, green and white ash seeds



Note that the angle of the wing is much straighter on green ash as the wing goes towards the tip of the seed. The white ash wing is more curved

Black ash

Green ash

White ash



# When are seeds ready to collect?



- Must first know the seed structures to observe if they are developing and maturing.
  - The following slide shows the structure of a mature ash seed
  - Subsequent slides show seeds in different stages of development and the changes they undergo as they mature.

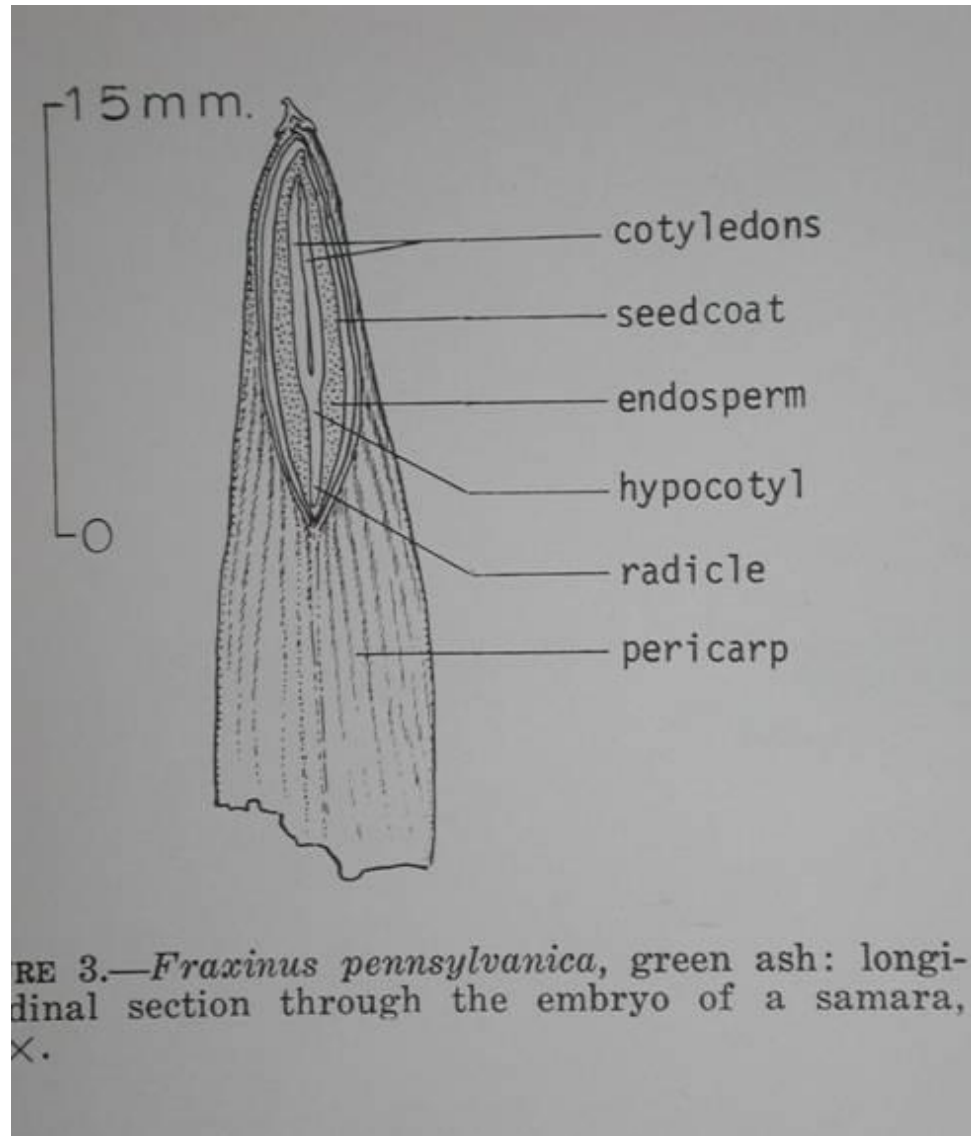
## Seed Structure

It is important to know the structure of the seed for determining when seeds are mature and good for collecting.

What is called the seed in practice is actually the fruit, samara, of the ash tree. The true seed is inside the fruit.

The pericarp in this drawing is the fruit wall. This fruit type is a samara. A samara is a one-seeded, dry, indehiscent, winged fruit.

The first seeds to fall are empty or damaged by insect. This is an x-ray of seeds fallen from a tree in late August.



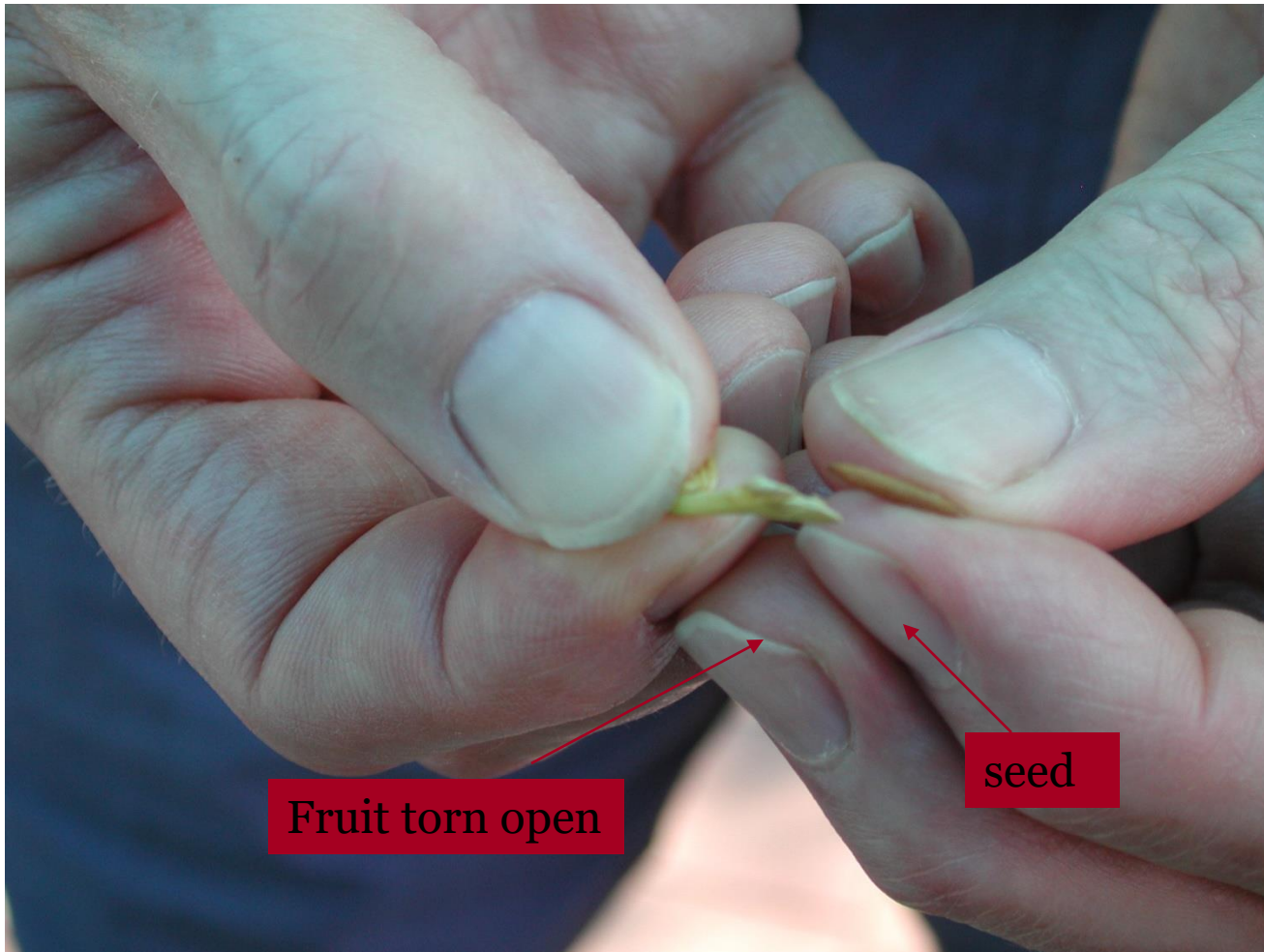
# Examining Seed



To examine the seed, first grasp it as shown here. The fruit can then be torn open with the thumb nail of the other hand to expose the developing seed.

This fruit has been torn open to expose the seed for examination.





This seed has been pulled from the fruit after tearing the fruit open. The brown seed color indicates the fruit is ready for harvest.

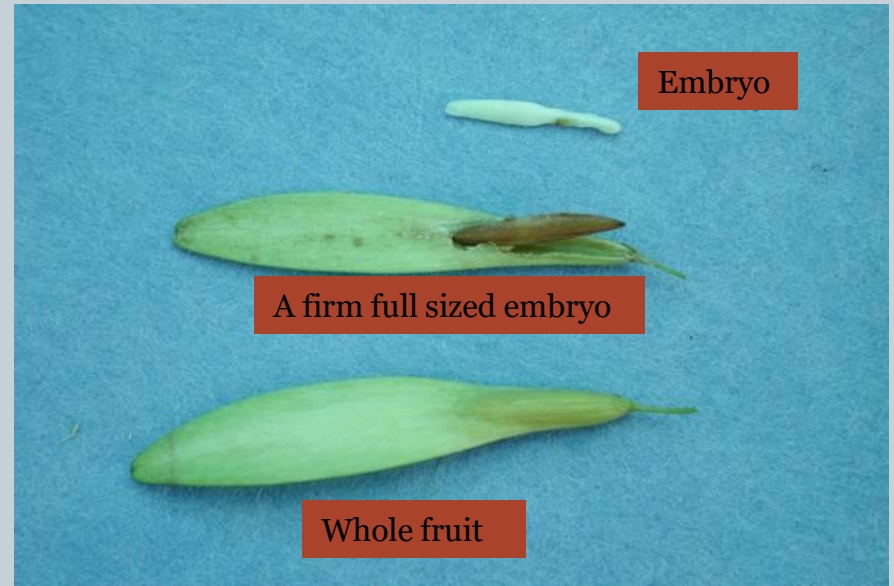


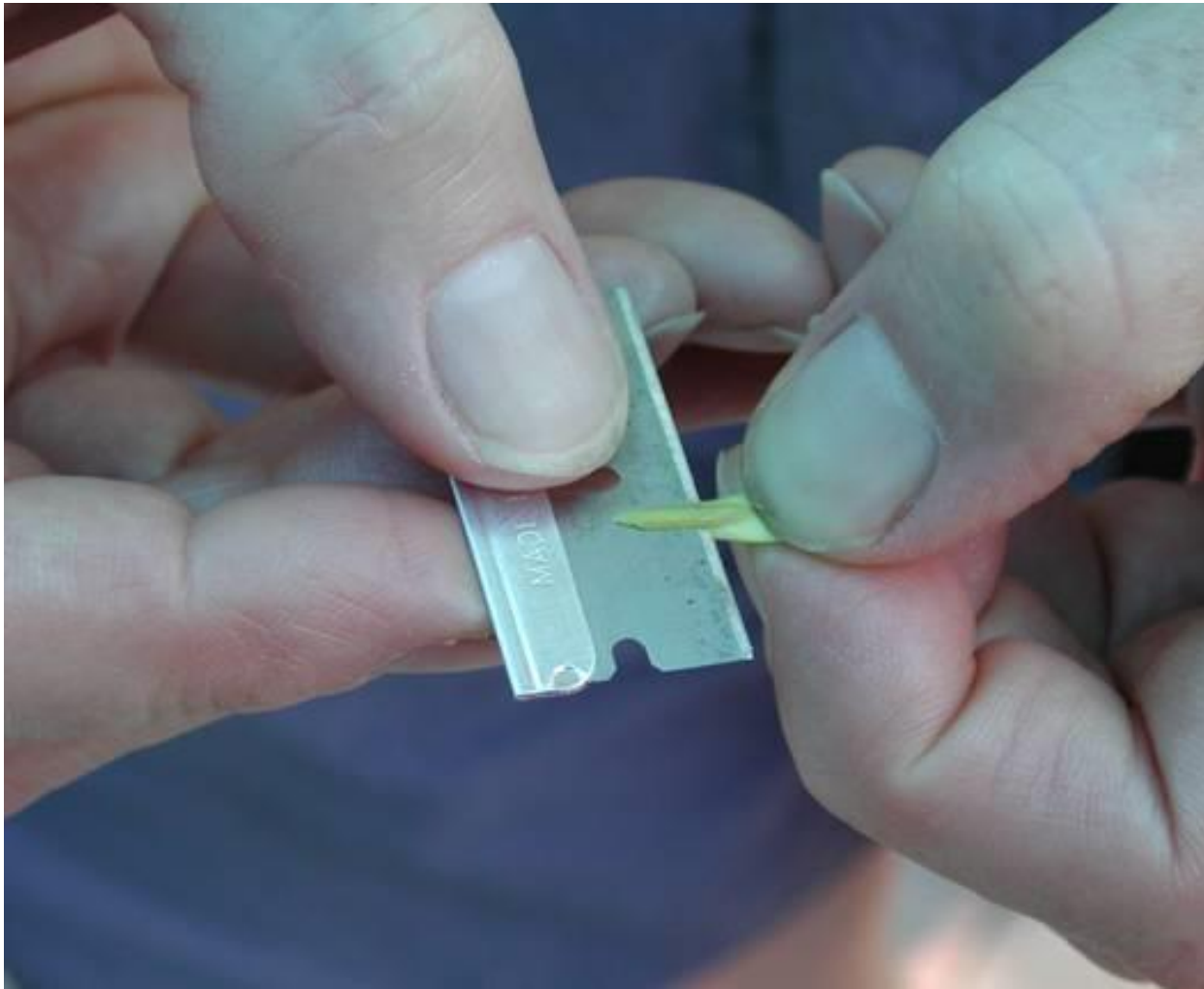
# Maturity



A green immature seed excised from the fruit with the embryo excised from the seed. The embryo is firming up but is still immature.

White ash seeds at different stages of examination. These seeds are ready to collect because the seed coat is brown, the seed fills the fruit, and the embryo and endosperm are firm and not soft or milky.





Fruits can also be cut longitudinally with a razor blade to make a clean cut that sometimes makes it easier to see more detail.

# Cut Tests



Longitudinal cut showing the developing seed. This seed is about half of its mature size. It is important to distinguish between the seed and the placental tissue next to it. Otherwise it could be concluded that the seed fills the fruit when in fact it only about half fills the fruit with the other half filled with placental tissue. This seed is not mature enough to harvest. The seed must develop further.



Longitudinal cut showing the developing seed. This seed is almost mature size, but is not mature enough to harvest. The seed coat is still green in color. Seeds from their mother tree must develop further before picking.







Longitudinal cuts on green ash seeds showing that the seed coats have matured and turned tan colored. These seeds are ready for harvest.



# Insect damage on seeds



- When insects feed on seeds the seeds are often killed.
- A longitudinal cut with a razor blade or knife will show if the seed is damaged.
- Insect damage can also be seen in an x-ray
- Weevils and seed bugs cause damage to ash seeds.

# Insect Damage

These fruits apparently have been attacked by a seed bug.



A weevil larva has destroyed this seed



# The Actual Seed Collection



- **Prerequisites**
  - The species of ash has been identified
  - A tree with an abundant seed crop is located
  - Examination of the seeds shows they are full, mature, not damaged by insects
  - Assembled the collection materials

## Ash Seed Collection Data Sheet

Date of collection: \_\_\_\_\_

Collector's name: \_\_\_\_\_

Species (check one):  Black  Blue  
 Green  Pumpkin  White

**Seed Lot Identification**

Collector's ID number: \_\_\_\_\_

Seed lot number: \_\_\_\_\_

State \_\_\_\_\_ County \_\_\_\_\_

GPS Coordinates: lat \_\_\_\_\_ long \_\_\_\_\_ elevation \_\_\_\_\_ meters

Decimal Degree Format      Accuracy + \_\_\_\_\_ ft

Number of ash trees within 20 to 40 feet of this tree:  0,  1,  2 to 4,  5 or more

Number of other trees that are not ash within 100 feet this tree:  0,  1,  2,  4 or more

Distance between this tree and nearest other ash tree from which seeds were collected.  
 100 feet (minimum),  200 feet,  more than 200 feet

Soil:  Rocky  Gravel  Sand  Loam  Clay

Site type:  upland  wetland  aquatic.

**Complete only for upland sites**

Topography:  Flat  Slope (Aspect:  N  S  E  W)

**Directions to the site if not using GPS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Twig sample has been put in bag  Trunk and whole tree photos have been taken

A data collection sheet is needed for each seed lot collected in order to maintain its identity. These sheets are found in the accordion folder.

Filling out the data sheet is the first step in taking the seed from the tree.

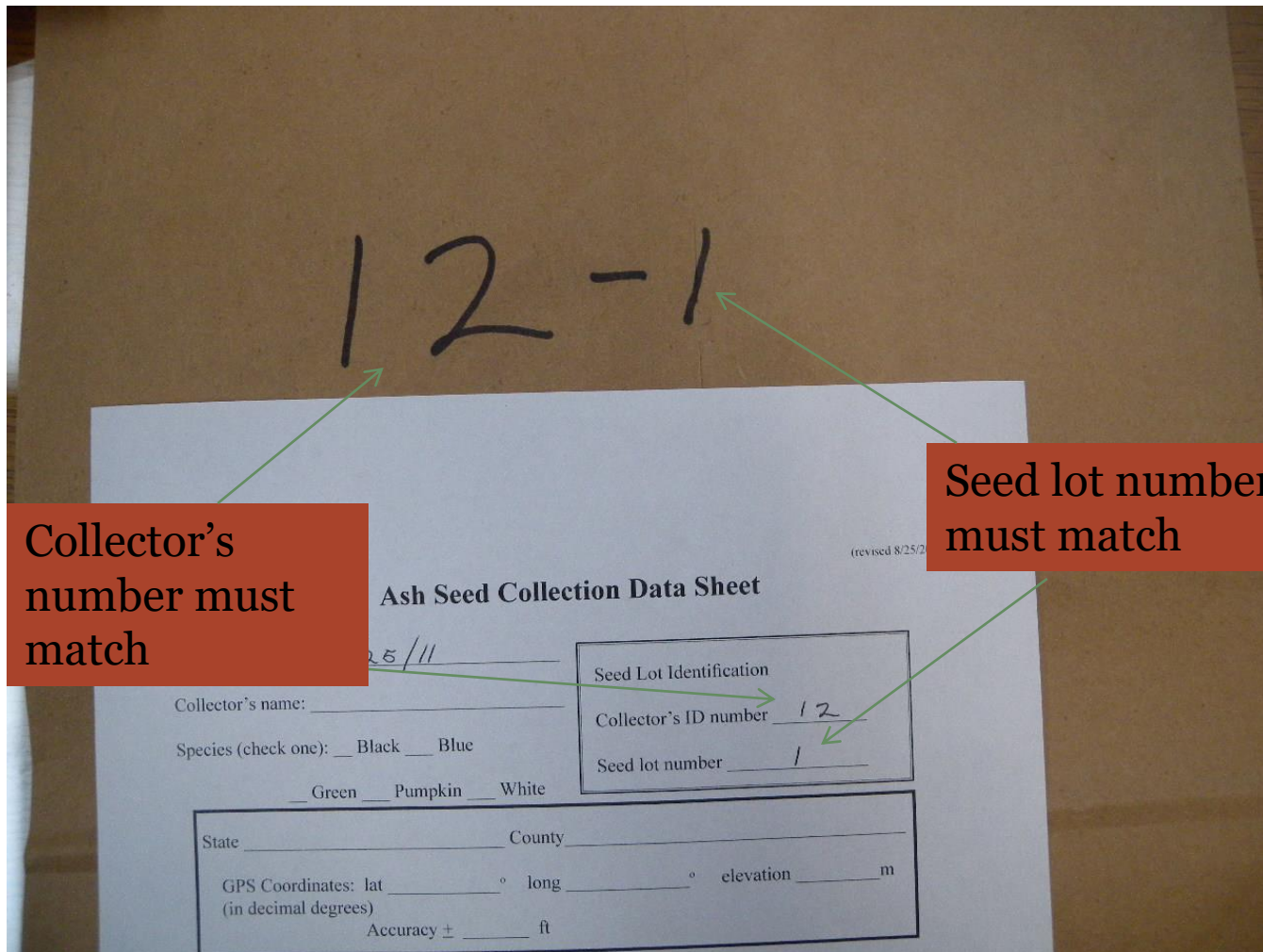
“Collector’s ID number” and “Seed lot number” maybe filled in by the seed lab before the data sheets are sent to you.

If the “Collector’s ID” and “Seed lot number” are not filled in, obtain specific instructions from the seed lab on what numbers to use.





Clearly write the collector identification number and seed lot number on the collection bag for the seeds. Use a dash as shown to separate them. Write the collector's ID number first followed by the dash and the seed lot number.



Bag number and data collection sheet numbers must match exactly for the seed to be positively identified and useable in the gene preservation program.

# Ash Seed Collection Data Sheet

Date of collection: \_\_\_\_\_

Collector's name: \_\_\_\_\_

Species (check one):  Black  Blue

Green  Pumpkin  White

### Seed Lot Identification

Collector's ID number: \_\_\_\_\_

Seed lot number: \_\_\_\_\_

State \_\_\_\_\_ County \_\_\_\_\_

GPS Coordinates: lat \_\_\_\_\_ long \_\_\_\_\_ elevation \_\_\_\_\_ meters

Decimal Degree Format Accuracy + \_\_\_\_\_ ft

Number of ash trees within 20 to 40 feet of this tree:  0,  1,  2 to 4,  5 or more

Number of other trees that are not ash within 100 feet this tree:  0,  1,  2,  4 or more

Distance between this tree and nearest other ash tree from which seeds were collected.

100 feet (minimum),  200 feet,  more than 200 feet

Soil:  Rocky  Gravel  Sand  Loam  Clay

Site type:  upland  wetland  aquatic.

### Complete only for upland sites

Topography:  Flat  Slope (Aspect:  N  S  E  W)

### Directions to the site if not using GPS:

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

Twig sample has been put in bag  Trunk and whole tree photos have been taken \_\_\_\_\_



# Picking the Seeds



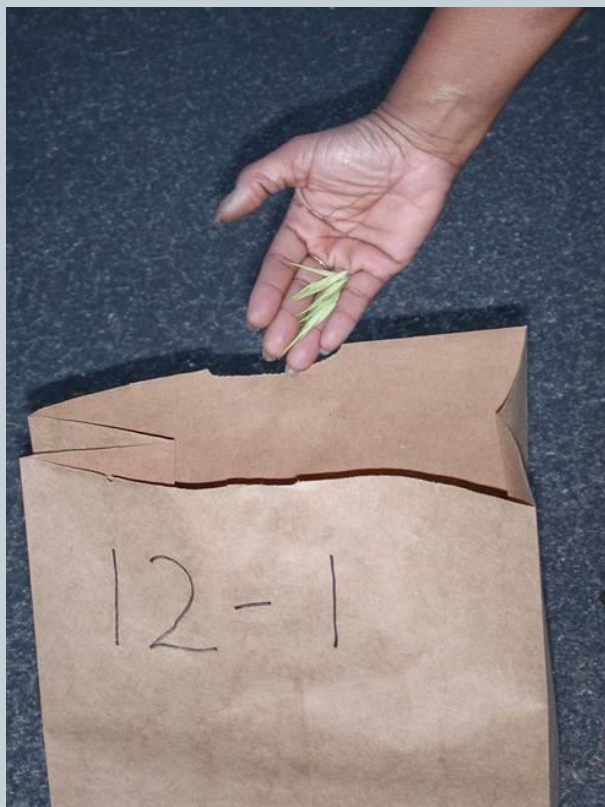
For seeds that can be reached from the ground, hold the branch in one hand and pull or strip the seeds from the tree with the other hand.

Seeds pulled from the tree.





The seeds are next put into the collection bag that was marked earlier with the Collector's ID number and Seed lot number



As an interim step it is often helpful to toss the seed into a tote bin. The bin is more stable on uneven ground and in the wind than is a paper bag. Once the seeds are collected they can be transferred from tote to bag. The tote can also serve as a carrier for the collection supplies.





As many seeds as reasonably possible should be taken from each tree. This will maximize the benefit from the effort of finding the tree by making the most research possible.

A good minimum to shoot for is to cover the bottom of the paper grocery sack about 3 inches deep with seeds.

It would not be a good use of time and supplies to take more than one full bag from any one tree.







## Twig Sample

After picking all the seeds that can be reached, a twig sample is taken for identification purposes. To do this grasp the twig with both hands and break off a the end of the twig (about a 6 to 9 inch long piece).

The twig should snap off relatively easily. From a tall tree it may be necessary to use a pole pruner to take the twig sample.

Pull all the leaves off of the twig and drop it in the bag with the seeds you have just collected.





With the twig sample in the bag, fold the top of the bag over once and staple it shut in three or four places to be sure the seeds will not spill out.

Bags can be folded down to make them easier to ship and carry.



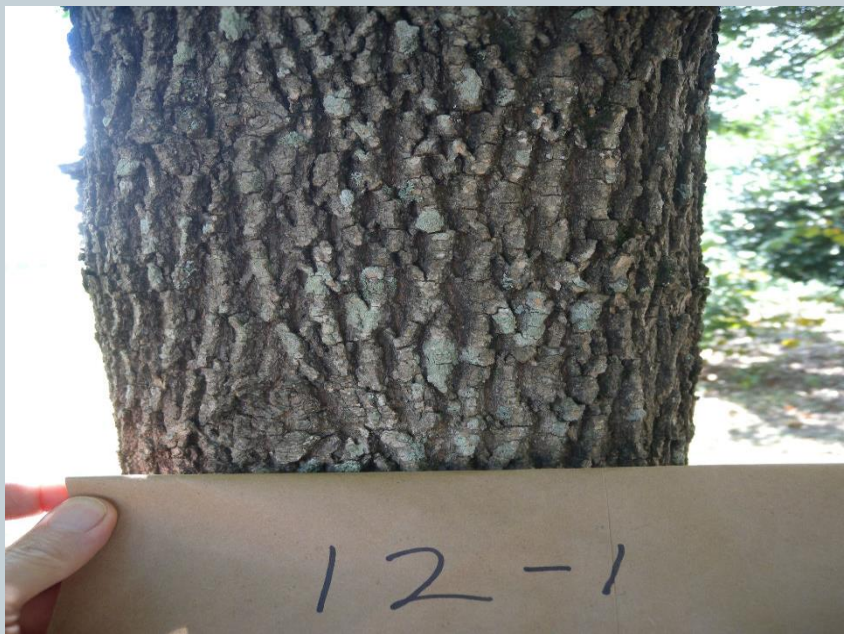


# Photos



Take a picture of the tree. The photo provides back-up information about where the tree was growing, its size, condition, and what other trees were growing nearby.

Two photos are taken of each tree. One photo of the trunk and one of the full tree. Take the photo of the trunk first. In this way the whole tree photo will be associated with the correct trunk photo. Hold the collection bag against the trunk to show the seed lot number when photographing the trunk. This will identify the seed lot to the tree photos.



# Post harvest handling



- Keep the seed out of the heat (over 90°F)
  - Do not leave in the car in the sun
  - Store them so they do not dry out, but they must remain cool.
- Ship the seeds, along with their leaf samples, frequently to the address provided.
  - You will receive instructions with your supplies on when, to who, and how to ship the seeds.
  - Upon arrival at the processing location the seed will be given a 2 to 4 week chilling treatment that will cause any weevils to leave the seed.
    - ✦ This is why the seed is kept moist after harvest. Premature drying of the seeds will kill the weevils before they can exit during the chilling treatment.
    - ✦ Once the weevils exit the seeds, the weeviled seed will be more easily separated from the good seeds with a seed cleaner. This makes the seed higher quality for growing seedlings.
    - ✦ The seeds are dried and cleaned after the chilling period.

# Mailing Instructions



- Please ship the sample using the shipping materials provided.
- Mail to:  
Clara Holmes  
Mid-Atlantic Regional Seed Bank  
Greenbelt Native Plant Center  
3808 Victory Boulevard  
Staten Island, NY 10314
- Please send us an email and let us know you've sent us mail. Thank you!

# How the Seeds Will Be Stored Long Term



- Dried with air of 30% relative humidity or less until dry.
- Sealed in a moisture proof container
  - 4 to 6 mill poly-foil bag, or
  - Plastic bottle with a tight lid
- Frozen at  $-8^{\circ}\text{C}$  or below
- All collections recorded in the GRIN



# Thank you!



NYC Parks



SEEDS



OF SUCCESS