

Longleaf Pine Cone Maturity

Measuring Specific Gravity

Key Points About Collecting Longleaf Cones

- Only mature cones will give high germination and good yields of seeds
- An objective measure of maturity is needed so that only mature cones are taken
- There will be a desire to collect as many cones as soon as possible and as early as possible – remain objective and do not start early as this will give poor seed quality

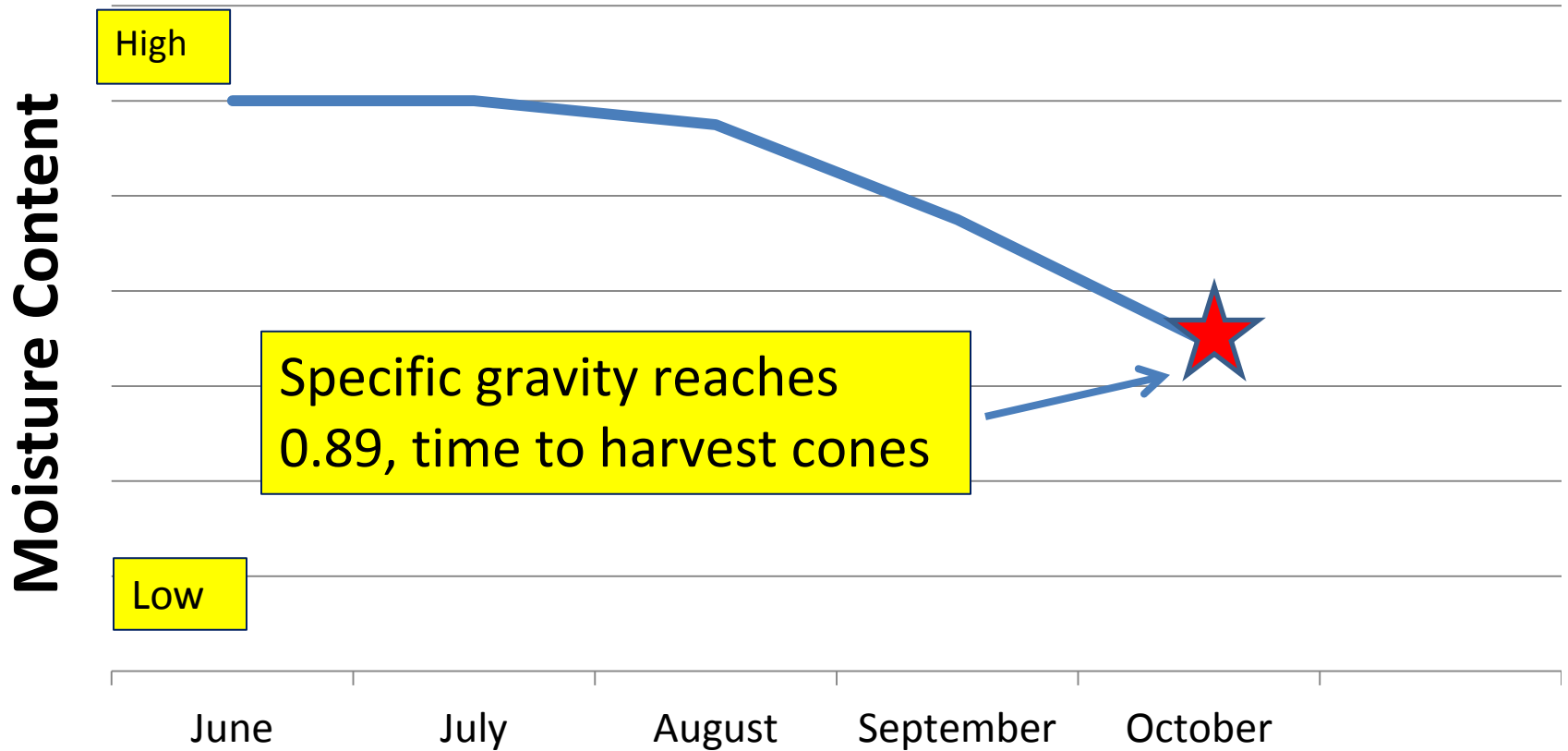
Benefits of Collecting Mature Longleaf Pine Cones

- More detail on collecting found in: Guidelines for producing quality longleaf pine seeds Author(s): Barnett, James P.; McGilvray, John M. Date: 2002 Source: Gen. Tech. Rep. SRS-52. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 21 p. Station ID: GTR-SRS-052 - See more at: <http://www.srs.fs.usda.gov/pubs/4538#sthash.Be7KHycV.dpuf> mature cones can be found in the pamphlet
- <http://www.srs.fs.usda.gov/pubs/4538>

Stages of Cone Maturation

- 2 years are required for a cone to mature
- Year 1
 - Pollination occurs in the spring
 - Cones remain small through this 1st year
- Year 2
 - Fertilization occurs and cone grows to full size
 - Embryo and seed grow to full size
 - Cones gradually dry in preparation for seed shedding

Cones Dry Down as They Mature



What is Specific Gravity ?

- The weight of an object compared to the weight of a volume of water equal to the volume of the object
- A measure of how well a cone will float in water
 - Specific gravity greater than 1, the cone sinks
 - Specific gravity less than 1, the cone floats
 - The lower the specific gravity the better the cone floats

These Three Cones Are Floating in Water.
They Have Specific Gravity Less Than 1



How Is Specific Gravity Measured ?

The next 8 steps will show you how

Step 1

- . Obtain a 4 inch diameter cylinder
 - Large enough to accept the large longleaf cone
 - Make from these parts
 - 4 inch pvc toilet flange with knock out in place
 - 18 to 24 inches of 4 inch diameter pvc pipe
 - Pvc cemet to glue flange to pipe
 - There can be no leaks from the joint between flange and pipe
 - Use plenty of pvc cement putting glue on the inside of the pipe first and on the flange second, immediately put pipe onto the flange and hold for several seconds

Toilet Flange Makes the Base for the Test Cylinder



Step 2

- Pour water into the cylinder sufficient to float cone and deep enough to fully submerge cone



Step 3

- Remove stem from cone if it is present with pruning shears or sharp knife



Step 4.

- Measure the distance from top of cylinder to top of water (measurement A)
 - A metric ruler is best because it has fine mm markings
 - Place a mark on the top of the cylinder at which to take measurement for consistency
 - Hold the ruler as vertical as possible
 - Practice this step until you get the same measurement every time (+, - no more than 1 mm between measurements)

Step 4



Step 5

Slowly lower cone into water, top down, for easy submerging later, do not drop



Step 6

Measure from top of cylinder to new water level
(measurement B)



Wire Holder for Submerging Cones in Step 7



Step 7

Submerge cone with wire holder and measure from top of cylinder to new water level (measurement C)



Step 8

Compute the Specific Gravity

Measurements			Cone Weight	Weight of Water Displaced	Specific Gravity
A	B	C	A-B	A-C	$(A-B)/(A-C)$
169	149	144	20	25	0.80
174	157	150	17	24	0.71
172	155	147	17	25	0.68
188	171	165	17	23	0.74
185	171	166	14	19	0.74
184	172	168	12	16	0.75

Step 9

- Repeat steps 3 through 8 until 20 cones have been tested for specific gravity
 - Repeat step 2 as needed to keep water levels sufficiently high to float the cone
- Cones should all be tested immediately upon removing from the tree
- 19 of the 20 cones need to have specific gravity of 0.89 or less before harvest can be started