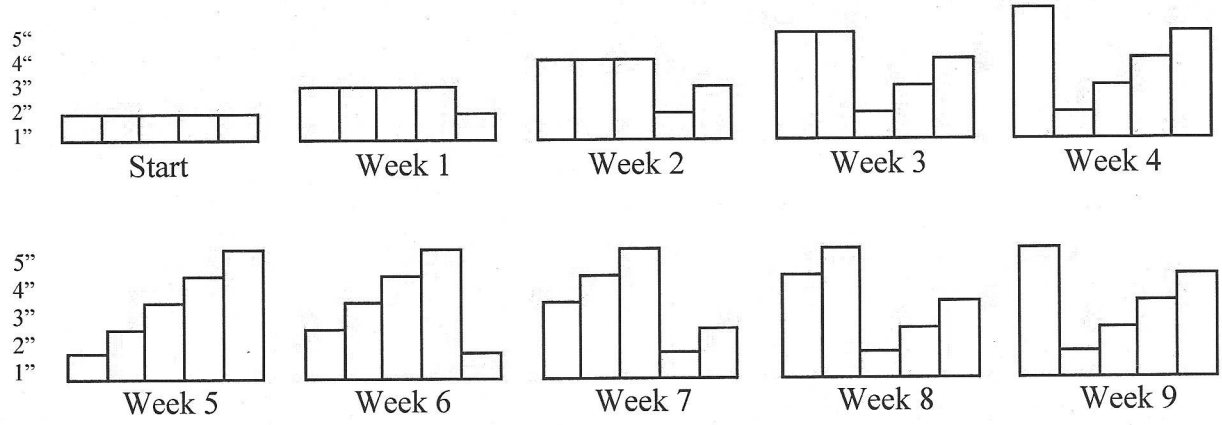
HOW TO HARVEST THE GROWTH, THE WHOLE GROWTH AND NOTHING BUT THE GROWTH WITHOUT KNOWING WHAT THE GROWTH IS

Before a Non-industrial Timber Management Plan can be approved, the stand to be cut must undergo a rigorous sampling. The data collected is used to estimate the growth of the stand. Harvesting is limited to the estimated growth. After harvesting the stand may need to be sampled again to refine the estimate. We do all that to ensure harvesting does not exceed growth. The process is difficult, time consuming and costly – and a total waste of time and money. There is a common cutting method that easily harvests the growth, the whole growth and nothing but the growth, without knowing what the growth is. It's called percent cut. The following shows how easy it is.

PERCENT CUT HARVESTING IS AS EASY AS MOWING A LAWN

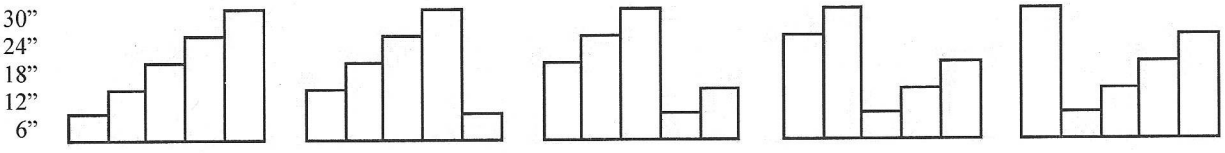
Divide a lawn into five strips. Every time the grass grows 1" in height, mow a strip with the tallest grass – a 20% cut. If the grass grows 1" per week, that will create a five cut rotation five weeks in length. That is, it will take five cuts at one week intervals to complete the cycle. Here's how the cutting pattern develops if we start with 1" tall grass that grows 1" per week. The figures below depict the height of the grass in each strip.



Equilibrium is achieved in Week 4. The pattern that week, and the pattern every week thereafter, contains 1", 2", 3", 4" and 5" tall grass. Cutting is automatically balanced with growth. Over-cutting is impossible. Sustained yield is automatic and guaranteed. The prescription will harvest five inch tall grass every week in perpetuity. We can begin with any combinations of grass heights, and the results will always be the same. Equilibrium is achieved independently of the starting condition by simply applying the cutting rule. Therein lays the guiding principle of percent cut harvesting.

A PATTERN OF CUTTING CREATES A PATTERN OF GROWTH

That principle works just as well in the woods as it does in a lawn. In the lawn we allowed five strips of grass to grow 1" in height between cuts. In the woods let five strips of trees grow 6" dbh between cuts. The figures below depict the diameter of the trees in each strip once equilibrium is achieved. This cutting scheme harvests 30" dbh trees in perpetuity.



But the trees don't have to be in strips. A simple cutting prescription applied across the entire stand will create a more or less even distribution of the various tree sizes. The prescription consists of the percent cut (measured in trees 18" dbh and larger) and the dbh growth between cuts (measured on dominant trees). If the largest trees are taken first, the only question is: What size harvest trees will a given prescription produce? Maximum harvest tree size is a function of the percent cut and growth between cuts. For example, frequent light cuts will produce larger harvest trees than frequent heavy cuts. A couple of estimates illustrate that principle. Taking the largest trees first, 25% cuts with 4" dbh growth between cuts produce harvest trees up to about 32" dbh. Taking the largest trees first, 50% cuts with 4" dbh growth between cuts produce harvest trees up to about 24" dbh. The maximum size of the harvest trees is controlled by the combination of percent cut and growth between cuts.

Dale Holderman, RPF 69, 5/9/13

CUTTING RULE PRODUCES MAXIMUM HARVEST TREE SIZE ABOUT 30" DBH

PERCENT CUT / DBH GROWTH SINCE PREVIOUS CUT
MAXIMUM DBH HARVESTED (FROM FORSEE) WHEN LARGEST TREES TAKEN FIRST

Cut	20% / 3"	30% / 4"	40% / 5"	50% / 6"	60% / 7"
1	74.9	74.9	74.9	74.9	74.9
2	37.2	35.5	33.4	32.4	33.0
3	35.5	33.8	31.5	32.1	31.0
4	34.4	31.5	31.7	31.2	30.4
5	33.2	31.7	29.4	30.4	30.2
6	31.8	31.6	30.5	30.4	30.1
7	31.2	30.6	30.2	30.1	29.9
8	31.5	30.6	30.5	30.4	30.5
9	31.1	31.7	30.6	29.9	29.9
10	32.9	31.5	30.7	30.4	30.7
Holderman[1]	33.0	32.0	30.0	30.0	28.0
Yrs btwn cuts[2]	10	12	14	16	18
Hvst Vol/year[3]	2,111	1,965	2,007	2,091	2,008
Cuts/rotation[4]	11	8	6	5	4

[1] Maximum dbh harvested at equilibrium in Holderman's percent cut model.
[2] The number of years between cuts is a guess loosely based on the number of growth units generated by FORSEE. The interval between cuts actually is measured in growth.
[3] FORSEE's total volume in the 10 cuts / years in the nine intervals between cuts.
[4] Number of cuts in one rotation from Holderman's percent cut model. (One rotation is the years needed to grow a tree to harvest size.)

BASIS FOR TABLE: Each cut removes the indicated percentage of trees 18" dbh and larger, taking the largest trees first, following the indicated growth since the previous cut. For example, Cut 3 @ 40% / 5" means that in cut 3 40% of the trees 18" dbh and larger were cut, taking the largest trees first, following 5" dbh growth since the previous cut. The largest trees cut had a dbh of 31.5".

The maximum growth between cuts was computed in FORSEE by averaging the dbh growth of trees within 4" of the maximum dbh of the stand. For example, if the largest tree in the stand is 37.3" dbh, then the dbh growth since the previous harvest of all trees 33.3" to 37.3" dbh was averaged.

THE CUTTING RULE: The average inches of dbh growth of dominant trees since the previous harvest minus one, times 10 equals the maximum percent cut allowed of trees 18" dbh and larger where the largest trees are taken first. For example, 3.7" dbh average growth of dominant trees since the previous harvest minus one, times 10 equals 27% maximum percent cut of trees 18" dbh and larger, taking the largest trees first.

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