Sampling

Forests are generally too large and have too many trees for a 100% inventory of every tree. Limited time and money for cruising usually dictates that the population be sampled. Samples are collected that hopefully will represent the entire population. Sampling has to be done in a way that the answers are still reliable. Reliability comes only when the stratification is done properly, the acres are calculated correctly, the right sampling method is used, the trees are measured or estimated correctly, and data are properly extended to useful information.

There is always some risk of not having the right answer when sampling. Bias can cause a systematic distortion. This can be caused by using the wrong sampling system, bad measurements, or poor estimates. This can only be avoided by cruiser training and continually measuring all of the parameters all day, every day.

Accuracy means the estimates are close to the true values. Often, cruisers will measure one parameter, such as DBH with great precision, and guess all of the heights and have very inaccurate cruise. The measurement effort must be balanced among all parameters in all species to avoid bias and error.

The populations in forests are often variable. Every tree can have a different volume and balance and every acre a different volume and value. This variation is measured by installing a series of samples spread over the entire population.

SuperACE calculates and reports a "Statistical Summary" for each timber type. Variation and Standard Error are calculated for basal area, net cubic feet per acre, and net board feet per acre. The confidence limits are printed for each parameter for a given standard deviation. Usually foresters use one standard deviation, or that the average will fall in the confidence limits 67% of the time.

The statistical calculations are done after the cruise is complete. Rarely is it feasible to go back to the forest and take more samples. The cruiser must decide before starting the cruise, what kind of sampling system to use, what kind of plots to take, and how many plots to establish.

Stratifying the forest into homogeneous types usually brings the Coefficient of Variation in normal forests to around 50%. We have found that 30 to 40 proportional plots with an average of 4 to 6 trees per plot, or a total of around 150 sample trees will yield accurate answers that will cut-out around + or –10%, 67% of the time. Stands with more variation require more plots. Count plots should be used when the basal area per acre varies more than the volume per acre. Count plots only measure species and basal area per acre.

Common sense and a basic knowledge of the various sampling systems are more important than sampling theory.

Key to Timber Cruise Sampling Method

To use this key, make estimates based on observation, aerial photographs, comparable data and personal knowledge of the timber stand. Record the following stand conditions:

1. total height
2. average diameter
3. acres
4. stand structure

Start at the top of the key and review each of the conditions about the stand. Select the sampling method to which the key leads.

REFORESTATION CRUISES: (Trees up to 20 feet tall)

Stocking variable ....Variable radius
Stocking even; density adequate........................Fixed Area

TIMBER CRUISES: (Trees over 20 feet)

Small area up to 10 acres

Area known
Small trees up to 8" ....Fixed area
Few large trees...100 %
Many large trees...Strip or fixed
Area unknown
Few trees ....100 %
Many trees ....Strip

Larger area over 10 acres

Area known
Small trees up to 8" ....Fixed area
Tree over 8" ....Prism
Even aged stand with large tree overstory ....Prism plots plus 100 %
Variable Stocking..Prism plus count plots
Homogeneous stand (Spp and DBH) ....Prism plus count trees
Area unknown...Strip

Sampling Methods

Reforestation Cruise

Reforestation surveys are used in stands with heights of less than 20 feet. Timber stands taller than 20 feet have measurable volume and should be sampled with a timber cruise program. Reforestation surveys are entered in the TC-Tree Input screen of SuperACE by placing **R1, R2, R3, R4** or **R5** in the **PF** column to indicate a fixed radius reforestation plot. Values are assigned to the R1 thru R5 factors on the type master screen. For example, if you're running a stocking survey with 1/100th acre plots, R1 is entered in the PF column for each tree record. In the type master screen a value of 11.78 (plot radius, in feet, for a 1/00th acre plot) is entered in the cell next to R1. Values for R2 thru R5 are left blank since only one plot radius was used in the survey. All blank plots must be recorded in order to calculate stocking. Blank plots are recorded by entering a plot number, species, and 0 in the **Ct** column.

100 % Cruise

This is not a sampling method, but rather a complete or 100% cruise of the entire population. This is rarely feasible. Do not attempt a 100% cruise unless you are absolutely sure all trees can be identified and measured. A 100% cruise tree is entered in SuperACE by preceding the plot number with a dash (-). For example –001. Or, use **S1** in the **PF** column for the tree and assign a value of "1" in the type master screen.

> Situations for use:
>
> 1. A cruise of one tree.
> 2. Marked trees along a right-of-way.
> 3. A few (less than 100) large scattered trees in a reproduction type which can be easily identified.
> 4. A few scattered, large trees of a merchantable type, which are usually a different species, age, and of high value; i.e., older Douglas-fir trees in a younger stand. The younger trees may be prism cruised while the more valuable Douglas-fir trees should be 100% cruised.

> Advantages
>
> 1. No sampling.
> 2. Provides a record of every tree.

> Disadvantages
>
> 1. 100% cruises are expensive. The higher costs must be justified by specific requirements which cannot be obtained otherwise.
> 2. Possibility of missing trees.
> 3. Possibility of cruising trees twice.

Strip Cruise

A strip cruise is a cruise of a percentage of the total type area or number of trees. Continuous strips are run through the tract at regular intervals. A strip cruise is entered in the tree input screen of SuperACE by entering **S1, S2, S3, S4** or **S5** in the **PF** column for each tree record. A strip cruise "blow-up" factor is entered as a whole number on the type master screen. For example, if each tree cruised represents 5 trees (a 20% cruise) then a "**5**" is entered next to S1 on the type master screen. Values for S2 thru S5 are left blank since only one strip "blow-up" factor was used in the cruise.

> Situations for use:
>
> 1. Areas of unknown size.
> 2. Irregular shaped areas.
> 3. Irregular area with field around it.
> 4. Road right-of-way laid out in timber.
> 5. Narrow strip where powerline right-of-way is widened.
> 6. Brushy areas or areas with broken topography where prism cruising would not work.

Acreage's by types must be calculated with a strip cruise; however, they are only used to calculate volume per acre. The total volumes are calculated by multiplying the volume of each tree times the strip area factor.

There is no balancing of diameter and trees per acre as in a prism cruise. If the diameters are estimated too small in a strip cruise, the volume will be low.

> Advantages
>
> 1. Strip cruises can avoid critical acreage errors in small units.
> 2. Blow-up factors can be independent of acreage.
> 3. Brushy areas with scattered trees can be cruised accurately.

> Disadvantages
>
> 1. The entire tree distribution will be sampled, which may mean that many small trees will have to be recorded. These small trees add greatly to the cost of cruising but may not add to the volume and value.
> 2. An accurate baseline has to run completely through the number of strips for cruise % control.

3. Accurate strip widths placed at right angles to the baseline have to be constantly maintained with frequent checking of borderline trees. The strip center must be accurately marked in order to do this.

Fixed Area Plots

These are usually fixed circular plots of a certain size. These plots should be large enough to sample the population with an average of 5-10 trees per plot. The radius of the plot must be larger than the radius of the square of the actual stocking.

Plot Radius = sq.rt. (13,865.58*plot area)

Five fixed area plots can be nested in a plot. They are indicated on the plot card or data recorder with an **F1, F2, F3, F4** or **F5** in the **PF** column and the plot size defined on the type master screen. A plot radius is entered on the type master screen as decimal factor. For example, a ¼ acre plot is entered as 0.25.

Proportional Plots, Variable Radius Plots, Prism Plots

These are the most popular plots for cruising merchantable timber today. A BAF should be selected to yield an average of 5 trees per plot. Use the same BAF for the entire type or strata. SuperACE allows BAF of any number between 1 and 99.99. BAF that are whole numbers can be put directly in the **PF** column on the plot card or in the cruise input screen. BAF that have a decimal number are assigned in the type master screen and coded on the plot card or data recorder as **B1, B2, B3, B4,** or **B5**.

More than one BAF can be used in a type to sample various species or size groups.

Combination Sampling Systems

Types that have mixed species of extreme value, or a wide diversity in age or size, may have to be sampled with more than one system or plot size at the same time.

Nested plots can be used for many situations.

Merchantable stands, with a few scattered large trees, can be cruised with a BAF for the merchantable element and with a 100% or a strip used for the large trees.

Merchantable stands, containing a minor species of high value, can be cruised using a combination of prism for the major species and a strip cruise for the high value minor species.

Recording Blank Plots

If a blank plot (no trees on plot) is encountered on a timber cruise it must be recorded in order to calculate an accurate cruise. To record a blank plot, enter the plot number, prism or fixed radius code, species and a "0" in the CT column.

If nested plots such as a combination of prism with fixed radius (FI thru F5) or strip cruise (S1 thru S5), are being sampled and a blank plot occurs on any of the nested plots on the same sample point, it is recommended that the nested plot be recorded as a blank plot. If, at any time, a blank plot occurs on the reforestation plot (R1 thru R5) it **must be** recorded as a blank plot in order to calculate accurate stocking.

Recording Count Plots

Count plots are taken to supplement cruise plots. They are used when there is a need for more basal area measurements to measure stocking variation. This system allows recording the count by species. Count plots must be done exactly as the cruise plots, using the same form point and prism factor. Count plots are recorded by entering the plot number, prism factor, species and the number of trees in the CT column.

If *count plots* are taken with measure plots, **DO NOT** record *count trees* on the measure plots. *Count trees* can only be recorded on measure plots in a timber cruise with **no count plots**.

Recording Count Trees

Count trees may be recorded by diameter class on measure plots when similar diameters occur in a sampled species or identical measure trees occur on a plot. The count trees are recorded by entering the plot number of the measure plot being sampled, prism or plot radius factor, species, the number of trees in the CT column, and diameter.

If *count plots* are taken with measure plots, **DO NOT** record *count trees* on the measure plots. *Count trees* can only be recorded on measure plots in a timber cruise with **no count plots**.

Sample Design and Intensity

1. Determine the accuracy needed for the project or each sampling unit (type). Prioritize the sampling intensity to the highest value, largest, nearest to operations or highest volume per acre.
2. Stratify the ownership into sampling units (types) or operational units that can be sampled. Each type may be sampled with a deferent method and intensity.
3. The number of plot and tree samples is a function of the needed accuracy and the variation with the sampling unit. Stratification can reduce the number of plots needed to satisfy accuracy. Statistical calculations of the samples will determine the actual sampling error. Estimating the number of plots needed

for the accuracy comes more from experience than from statistical calculations before the sampling is started. Statistics from old cruises in an area can help in judging the number of plots that are required for a certain accuracy on types to be sampled. Average timber types have coefficient of variation of around 40 – 50% and can be sampled to about +/-10% at 1 standard deviation with 30 to 40 plots. Proportional plots require about 4-6 trees average or 120 to 240 trees. Stands with more variation require more plots or trees. To reduce the error by half requires four times the sample.

Determine the number of sample trees per plot

Proportional plots determine the BAF by estimating the basal area per acre and divide by 5 trees.
Example:
BAF = 100 sq. ft. per acre/5 trees = 20
Fixed area plots estimate the trees per acre and divide by 10
Example:
Plot Radius = 200 trees per acre / 10 = 20th acre = plot radius of 26.33 feet.

Determine plot spacing

Square grid = sqrt ((43,560 x type acres) / (number of plots))
Example:
Total acres = 44   Plots = 44
Square grid = sqrt((43,560 x 44) / (44)) = 208.71 feet.
Acres per plot = (plot spacing)^2 / 43,560 = (208.71)^2 / 43,560 = 1.00

Rectangular grid = Spacing between lines = (Acres x 43,560) / (# plots x distance between plots)
Example:
Total acres = 44   Plots = 44   Distance between plots = 132'
Spacing between lines = (44 ac. X 43,560) / (44 plots x 132') = 330'
Acres per plot = (distance between plots x spacing between lines) / 43,560 = (132' x 330') / 43,560 = 1.00

Lay out the plot lines on the maps to cross drainages and other patterns that may cause the sample to be in error. The acres per plot should be multiplied by the number of plots in each type to check the acres calculations and the plot count.

Measure the results

Statistical calculations should be computed for each type, the average for all types and possibly the standard error for the entire project. Cut-out records should be kept to check the actual against the estimated. Measurement errors must be considered. Measure the right things for quality results.

Order of Importance of Measurement Parameters

1. **Acres by strata or timber type**. The actual net acres in each timber type. Acres are used to extend most timber cruise samples and are as important as the sample.

    Three Methods of Acre Calculation

    A. Build a map from aerial photography or satellite imagery. A type map should be made of each area before sampling to help with the sampling design and intensity.

    B. Plot grid or strip cruise. Always check the accuracy of the maps on the ground.

    C. Survey or GPS of the area.

2. **Sampling System**. Use the key to determine which to use: reforestation, 100%, strip, fixed area, proportional plots, or a combination. The sampling system, sampling design, and sampling intensity are critical decisions to be made for every stand to be sampled. This cannot be a "cookbook" policy.

3. **Tree Count** on each and every plot, even count plots. When cruising with proportional plots, pick a BAF that will average 5 trees per plot. Do not change BAF from plot to plot.

4. **Tree height** of every sample tree. Heights should be measured to the nearest foot, not be classified. It is a measurement, and the most important of all of the tree measurements, for volume estimates.

5. **Species**. Correctly identify the species of each sample tree.

6. **Log Lengths and Scaling Rules**. Follow standard bucking practices for the area. Pencil buck the trees as they would be cut for the local markets. Logs are bucked in variable lengths according to local bucking instructions.

7. **Sort** and **Grade** classification for each log. These are value classifications and should be defined for each area as logs are bought and sold.

8. **D.B.H. (D4'H)** and **Form Factor**. Although low on the list, these are still important parameters and must be estimated or measured to reasonable accuracy.

9. **Defects**. Super ACE allows defect deductions to be taken on each log with feet and inch deductions or percent. Cull sections can be taken out with Sort 0, Grade 0.

10. **Bark Thickness**. This can be input into the program by species and should be measured in your area.

11. "**Ao**" Values. The constant used in equations for tree bole diameters.

Sources of error in cruising are:

1. Measurement or Estimating Errors – Mapping, plot and tree measurement.

2.   Sampling error – Statistical

3.   Calculating Errors

4.   Reporting Errors

5.   Mis-understanding or mis-interpreting the data or the information by the user.

Tree Measurements

The measurement of sample trees should include those measurements that result in the answers desired. Measuring trees, while cruising timber, can be done in a variety of ways. SuperACE™ requires a measurement or estimate of the diameter four feet above the stump along with a height. Heights can be taken to the tip, a fraction of the form point diameter, or to a fixed top diameter. For better estimates of volume and value, form factor can be measured or estimated for each sample tree.

Many cruisers use tapes for measuring the trees, which should be done. However, to save time and increase the accuracy of estimating, users can measure the trees from a distance with a relaskop and rangefinder.

Entering Data on Field Plot Cards

Please refer to the plot card example on page 16.

Plot No. - Plot Number (required). A Four digit plot number, alpha/numeric, is assigned to each plot. Each plot in a timber type must have a unique number. Duplicate plot number will computed as one plot. The program will check for duplicate plot numbers when you start entering a plot. Plot numbers should be pre-assigned when more than one cruiser is taking plots in a type. Plot Number –000 means the tree on the line is a 100% cruise and the tree volume will be added separately to a plot cruise. A strip cruise value of 1.00 does the same thing.

Tree No. - Tree Number. A three digit numeric field. Tree number is assigned by the computer except when measuring permanent plots. Users input tree numbers when measuring permanent plots for growth and each tree is going to be measured more than once.

PF – Plot Factor or Prism Factor (required). A two digit alpha numeric field. When a two digit number is entered, the field is a Prism Factor or Basal Area Factor (i.e. 20 equals a 20 BAF). If a decimal value is used for a prism factor then a B1, B2, B3, B4 or B5 is entered with the prism factor value defined in the type master screen (i.e. B1 is entered in the PF column and 33.61 is entered next to B1 in the type master screen). Glass prisms should always be checked for the proper prism factor. A letter followed by a number (i.e. F1, R1 or S1) is referring to a Plot Factor in the type master screen. These refer to various sampling systems and plot sizes.

Up to 5 options for each sampling system can be used:

System	Option	Example
Basal Area Factor:	B1 thru B5	B1 = 27.78
Fixed Area Plots:	F1 thru F5	F1 = 0.25 (One quarter acre plot)
Reforestation Plot Radius:	R1 thru R5	R1 = 11.78 (1/100 acre plot)
Strip Cruise Blowup:	S1 thru S5	S1 = 4.00 (25% strip cruise)

Identification
A. −Age (required): A one digit numeric field for age code. The age in years is input on the cruise master screen. Default age is code **1**. Up to nine ages can be input per type. Age is used for calculating the tree form, bark factors, growth, and for age class reports. If no age is assigned, then a default age of 30 is used for volume calculations.

Spp. – Species (required): A six digit alpha/numeric field is provided for species. The numbers or letters must match the active species screen. A species table must be active before the cruise data is entered. Species is very important. It is usually not a good idea to group species. Each individual species should be entered on the species table with appropriate factors and limits.

St. – Status (optional): A one digit alpha/numeric field. Input must match codes in the status table. Status is used to indicate dead trees, etc.

Ct. − Count (optional): The tree count. A two digit numeric field is provided for tree count. Count plots are used to adjust the trees per acre for the trees on the cruise plot. Trees can be counted on the plots by species and diameter. Count plots can be used with BAF, fixed area plots, and strip cruises. Blank plots are entered as a count plot with a species code and a 0 in the Ct. column.

Measurements
DBH – Diameter Breast Height: This field is required when cruising volume plots and optional when cruising count and regeneration plots. DBH is a four digit numeric field, including the decimal point, is provided for diameter. This diameter is normally at 4.5 feet above the ground on the uphill side of the tree. This diameter is measured four feet or 1.3 meters above the stump outside the bark. Diameters less than 99.9 inches can be input to the nearest tenth inch. Trees larger than 100 inches are input to the nearest inch.

FP – Form Point (required) – A two digit numeric field is provided for form point. Default is DBH (four feet above the stump). Form point is where Form Factor is measured and/or where the tree taken "in" with a BAF. If form point is defined as four feet, the program will automatically use a form point of 16 feet to calculate Form Factor. Form point can be varied for each tree if needed.

FF – Form Factor (required) – A two digit numeric code. Form factor is the percent relationship of the diameter at Form Point (16 feet) divided by the DBH. Default values for Form Factor by species are input on the species screen. If no form factor is entered, the form factor from the species table will be used.

TD – Top Diameter (required). A one digit alpha/numeric field. Top diameter is the diameter outside the bark at the top of the bole. This is entered as a single digit percent value or as an alpha value for diameter. As shown below.

Top Diameter Fractions of FP   **Top Diameters**

TDF = top dia. / dia. at Form Point   Alpha Codes

Code = % of diameter at FP	Code =	Inches	Centimeters
0 = Total Height	A = 1		2.5
1 = 10%	B = 2		5.0
2 = 20%	C = 3		7.5
3 = 30%	D = 4		10.0
4 = 40%	E = 5		12.5
5 = 50%	F = 6		15.0
6 = 60%	G = 7		17.5
7 = 70%	H = 8		20.0
8 = 80%	I = 9		22.5
9 = 90%	Etc….		

Bole Ht. – Bole Height (required)– A three digit numeric field. Bole height is the distance from the stump to the Top Diameter Fraction or the Top Diameter outside the bark to the nearest foot or meter.

Tot Ht. – Total Height (optional) – A three digit numeric field. Total height is the distance from the stump to the tip of the tree. Maximum tree height for a species is input on the species screen. Bole height and tree height can be entered individually or together.

Classification (optional)
Po (T1) – Position
     O = over-story – Older age trees, usually residual
     D = dominant
     C = co-dominant
     I = intermediate
     S = suppressed
     U = under-story – younger trees than the main canopy

CR (T2) – Crown Ratio percent of the tree length with canopy.
     1 = 10%
     2 = 20%
     3 = 30 %
     4 = 40%
     5 = 50%
     6 = 60%
     7 = 70%
     8 = 80%
     9 = 90%

Vi (T3) – Vigor

H = healthy, living tree, may have damage
M = alive, but damaged and/or is not normal.
D = dying

Da (T4) – Damage
     A = animal damage, unknown species
     B = bear
     C =
     D = deer
     E =
     F = fire
     G =
     H =
     I = insects
     J = J rooted when planted
     Etc….

T5 – other

Segments - Up to 12 Segments can be described for each tree (required for volume calculation).

S# - Segment number – two digit automatically assigned by the program. This includes cull segments, breakouts and logs.

Ln – Segment length. Two digit numeric. On the final log segment of a tree, a "- -" may be entered instead of a numeric length. If a "- -" is entered, the program will compute the length of the segment to the minimum top diameter. Log length min and max are defined in the species, sort and grade tables.

S – Sort – A single alpha or numeric code as described in the active sort/grade table.

G – Grade – A single alpha or numeric code as described in the active sort/grade table.

Bd. Ft. F. – Board Foot length deductions .
     I. – Board Foot diameter deductions

Cu. Ft. F. – Cubic Foot length deductions
     I. – Cubic Foot diameter deductions

% – Numeric field left blank when using length or diameter deductions. A **1** is entered when percentage deductions for both board foot and cubic feet are to be used. Percentages are entered as whole numbers (i.e. 10 equals 10% and 05 equals 5%).

Enter Plot Data Into SuperACE™

Before proceeding, please refer to the **'Option 2: Keypunch Plot Data'** section of the *Getting Started with SuperACE*™ booklet.

Plot data is keyboard entered into SuperACE™ through the TC – Tree Input screen. The TC – Tree Input screen is accessed by selecting a stand from the project stand selection screen, this is the first screen that appears after selecting a project, and clicking on the **TC – Tree Input tab** of the stand information screen. The fields in this screen are the same as the fields described on the Field Plot Card. Plot data can also be downloaded directly into SuperACE™ from a data recorder running the SuperEASY™ software package.
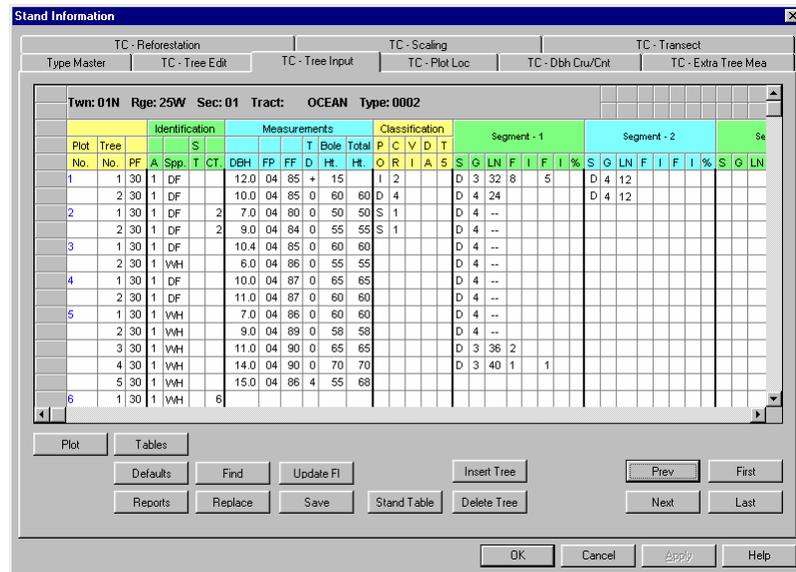
Editing Plot Data

Plot data is edited in the TC – Tree Edit screen. It is accessed by clicking the **TC – Tree Edit** tab of the stand information screen. It shows the data as it was entered in the **TC - Tree Input** screen or downloaded from a data recorder, along with the computed values and error messages for each log segment. This screen is used to edit the tree data that was entered in the TC - Tree Input screen. The tree data is edited directly into the screen cells and through the insert segment, delete segment, insert tree, delete tree, and replace buttons located at the bottom of the screen.
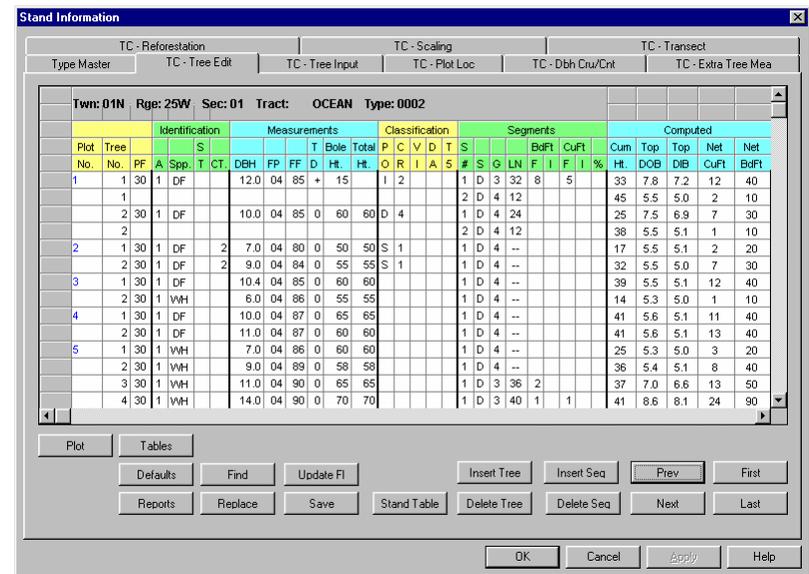
Computed (These fields are calculated automatically by the program.)

Cum Ht. – Cumulative Height – Height of segments including trim.

Top DOB – Top Diamater Outside Bark – The small end of the log, outside the bark, as specified in the scaling rule.

Top DIB – Top Diameter Inside Bark – The small end of the log, inside the bark, as specified in the scaling rule.

Net CuFT – The cubic feet in a log less defect deductions.

Net BdFt – The board feet in a log less defect deductions.

If a tree segment does not meet any of the parameters defined in the species or sort and grades tables an error message will appear in red to the right of the computed fields. Once the segment is edited the message will disappear.

After the editing of data is complete, the cruise data is ready for reporting. Please refer to the on-line help section, **'How To… Run Reports\Graphs'** in SuperACE™ or the **'Running Reports'** section of the *Getting Started with SuperACE*™ booklet.

SuperACE™ plot card

Running a Stand Table Adjustment Cruise

With this routine, existing stand table information can be entered into the TC – Tree Input screen of SuperACE™ and run against existing cruise information. Use this feature **only** if there is a high level of **confidence** in the stand table information. The stand table data is actually used to adjust the volume of the collected cruise data. This is useful in situations such as timber marking, dot tally cruises or percent cruises. **Do not** run this routine with count plots or count trees in the timber cruise.

The stand table information can be entered before or after the cruise is run. Every species and diameter class must be represented by at least one cruise tree. The stand data is entered by inputing **STND** in the plot number column, a species code, tree count and diameter class. The cruise data is entered as normal.

Below is an example of the TC – Tree Input screen with stand table and cruise data

				Identification				Measurements						Classification					Segment - 1						
Plot No.	Tree No.	PF	A	Spp.	S T	CT.	DBH	FP	FF	T D	Bole Ht.	Total Ht.	P O	C R	V I	D A	T S	S	G	LN	F I	F I	%	
STND	1	20	1	WH		99	12.0																	
	2	20	1	WH		45	12.0																	
	3	20	1	WH		20	14.0																	
	4	20	1	WH		10	17.0																	
	5	20	1	WH		20	18.0																	
	6	20	1	WH		5	30.0																	
T101	1	20	2	WH			12.0	16	89	4	64	80						8	3	40				
	2	20	1	WH			17.0	16	88	4	75	97						8	3	40	2			
	3	20	1	WH			30.0	16	87	4	90	102						8	2	40				
T102	1	20	1	WH			18.0	16	88	4	77	99						8	3	40				
	2	20	1	WH		1	14.0	16	87	4	64	85						8	3	40				

Twn: 01N   Rge: 01W   Sec: 11   Tract: TEST   Type: 1000

entered.

In the above example, the stand data listed WH 12.0'' at 144 trees. The CT column only accepts a two digit number, therefore, WH 12.0" has to be entered twice. Once with CT equal to 99 and again with CT equal to 45 so that the two entries together yield 144 trees.

Cruise reports can be run to view the results of the cruise after the data has been entered for the stand table and the cruise plots.

Timber Cruising

with

Atterbury Consultants Inc.

SuperAce 98 (TM)

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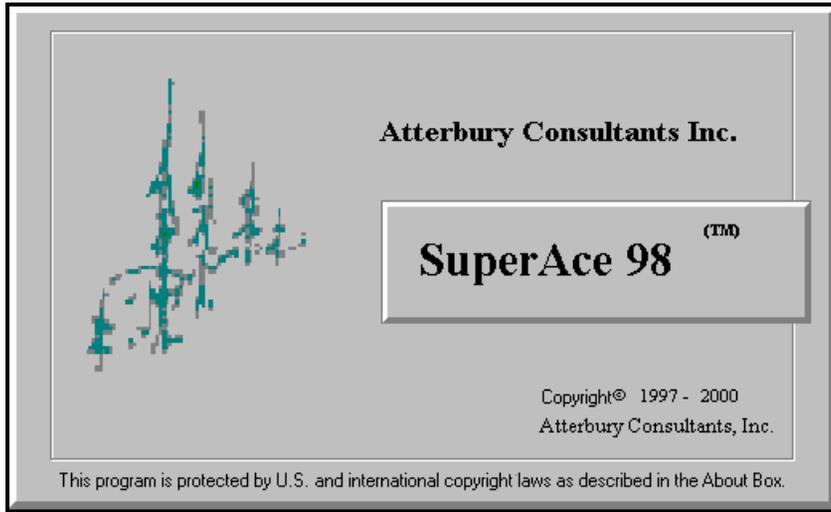
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