



WESTERN PINE ASSOCIATION

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THE NEED FOR SEGREGATION: DRYING MIXED CHARGES

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Most lumbermen need not be sold on the value of segregation. Nearly everyone who works with lumber, whether he mills, seasons, manufactures, grades, sells or builds with it, soon realizes that some form of sorting must be done for one reason or another.

Some of this sorting is mandatory, of course, and we cannot escape it. In the first place, lumber must be sorted to size, i.e., to thickness, width and length. Lumber must also be sorted to grade if the producer is to realize its greatest value and the consumer is to find in the retailers' stock the proper item for the job at hand.

The dry kiln superintendent, as a seasoning specialist, seeks a different type of sorting. He wants the lumber sorted to drying rate, so that he can dry lumber economically to a predetermined moisture range by means of special drying schedules. It is up to each of you to show the need of this special segregation. Now, that most of our mills are cutting so many species, the problem becomes quite complicated. The one very excellent way you have of convincing your management that segregation is needed is to prove the dollars and cents value of the segregation you seek. Get information on your problems from every possible source. Make use of the services of your Association and your dry kiln clubs. Seek out the methods that have proven successful at other plants so that you may be able to adapt them to your own operation. Many of these ideas may be old stuff to you, however, it is very helpful to go over the possibilities so that we may present them in more logical order.

Many of you kiln operators have found yourselves being forced into situations without being able to do very much about it. You are constantly being dictated to by the other departments of your plant. Your Shipping Department insists that you supply stock for a committed shipment when you know very well that you cannot supply it on time without seriously sacrificing quality. You may be asked to dry the cut of the sawmill plus the added burden of additional purchased lumber in ever-increasing quantities. How are you going to meet these demands? Only by efficient segregation can you gain both drying speed and moisture uniformity without being plagued by spiraling degrade losses.

Let us go back into the pages of the early history of lumber seasoning and quickly follow some of the evolution into present day methods.

In the beginning of lumber manufacture there was little seasoning or little sorting at the mill. The farmer often went to the mill and bought the product of the log in the green and stacked it to dry many months ahead of his building needs. Normally only the best trees were saved for lumber because lumber was a by-product. The aim was often land clearing for farming purposes.

In many areas, White Pine was king. Little else was saved for lumber. In the South it was Southern Yellow Pine and in the West it may have been Ponderosa Pine or Douglas Fir or Redwood. One species only was cut and there was little

sorting within the species. The smaller mills may have made two or at the most, three sorts. Clears were saved for finish; boards of common grade were saved for other uses and dimension was cut for framing. All of these sorts were normally cut from the best trees only. I can recall in the past watching the razing of some of our early day houses, torn down to make way for the buildings which were to follow as the towns built up. The grades of lumber used in these houses were generally very broad and often much too high for their intended use. Up in the hills here and there you may occasionally find a mill still cutting lumber this way.

The next step was the sorting of stock to thickness so that larger volumes could be milled with one planer setup. With the advent of the sideheads at the mill planers, another sort was added. By this means it was possible to send one width to the planer and further lessen the planer setups. Although this plan had some disadvantages, it also had merit and is still in wide use in many plants which have turned to the use of unit package handling. While we are discussing this phase, I should like to point out one way in which segregation by width can be used to conform somewhat to segregation by drying speed. In Ponderosa Pine, for instance, the sorts of 4" and 6" plus some of the 8" run heavily to sap and dry well together in the same charge. The 10" and 12" widths are generally cut from the heartwood and can be dried by themselves at a faster schedule in a shorter time without degrade. In Idaho White Pine, for example, the 12" width common lumber may have a large amount of water core which is difficult to dry rapidly and which will be heavy if pulled when the balance of the charge is dry. If any attempt is made to dry such mixtures without an equalization period, even greater problems arise. Heartwood in most instances is over-dried while the sapwood is still heavy. The very opposite is generally needed.

Even if it were possible to dry lumber acceptably this way, under present markets the time is fast approaching when we must meet more critical moisture levels or lose our trade to those who will.

These mixtures of stock sorted only by width regardless of drying needs have made disadvantages which we should not overlook. Any compromise in moisture level is difficult to attain without an unduly long drying time. Where no other means are available, schedules can be set up to dry such stock. These schedules must be mild enough in the beginning to prevent damage to slow drying items. After the bulk of the free water has been removed, steeper gradients are established in order to gain drying time. In the last third of the run conditions are set to equalize the stock. An E.M.C. is needed which will not only continue to dry the remaining heavier pieces, but will add moisture to the over-dried portion.

I might add a word of warning at this point. After lumber has been carefully dried in this manner, it is folly to let it stand around in stickered packages in order to save a small repiling cost. Unless such stock is taken off the stickers and placed into solid packages, the lumber will continue to dry until most of the value of this conditioning is lost. In hot summer weather the losses from such practices wipe out completely the care and effort put into careful drying. It is up to you as a kiln operator to be able to show your manager the value of correct handling methods, both before and after drying.

In the past, we have generally been cutting few species. Many mills have often cut but one. As conditions changed we cut more species and more grades in each species. Logs were then sorted by species. By cutting one species at a time the sorting pockets could all be used for the one species. Without this sorting, many mixtures developed which were difficult to season effectively. As new

species were added to our production, the value of this method was even more apparent. Log sorting became the first and probably most important step in the effort to secure adequate segregation. In the larger plants, a desirable method of gaining drying time was by drying in sorts which dried well together and which needed the same general final moisture content. Grade sorting was not necessary at this point as long as the other conditions were met. If enough stock of one type was available to make a drying sort, the grade could be separated later at the dry chain. The sort to width could also be made at the dry chain. In larger mills, length sorts were also made at this time. This splendid sorting made it possible to do a real job of drying on each segregation in the minimum of drying time. As markets change, more and more special items are sorted by grade from each species. Instead of allowing ourselves to be placed into the position of being forced to continually apologize for our product, why not be on the alert to the possibilities for the better sorting our plant may provide through careful planning.

In some plants, it is no longer possible to segregate so many ways. We are forced to dry these mixtures. Now that the unit package has been so generally adopted we may even have to dry more than one item in each crib. I am sorry to see the picture changing for there is no real substitute for adequate segregation.

Let me cite a typical example: A plant might have a double-track kiln drying Douglas Fir, White Fir and Ponderosa Pine. If this plant drew timber from the Western slopes, it might even be asked to dry Hemlock and possibly Sitka Spruce in this same charge. With no log sorting in the pond or deck, this method could easily send all these species through at once. The plant would be compelled to sort to thickness. The Shipping Department would want these items sorted to width if there is no dry chain, and unit packages would go straight to the planer without going over a dry sorter. Let us hope that this kiln operator can show management the need of keeping the sinker stock out of these mixtures! Stock would have to be piled with all lengths together, further complicating the building of square straight-sided packages without large void spaces through which the air will short circuit. Management will not want the dimension over-dried but the clears shouldn't be heavy. The dry kiln operator would be asked to protect the black knots in the common and as a final blow - dry this charge as soon as possible, if not sooner! Sometimes I wonder why anyone would deliberately choose such an occupation as being a kiln operator. We can be proud, however, of the way many of you have met this challenge.

Let us see what might be done in this case I have cited to you. In the first place, the spreads in temperature will have to be maintained closely enough to protect the Douglas Fir clears from checking. The higher moisture content of the Ponderosa Pine will serve to supply enough moisture for a time without turning on the sprays. Wet bulb temperatures must be held low enough to protect the Ponderosa from brown staining. In a double-track kiln, placing of the higher moisture content Ponderosa down one track helps distribute moisture evaporated and also helps equalize temperature from end to end.

In the second stage after the free water is out of the most of this stock, the temperatures are raised to hasten the transfusion rate while still holding a moderate spread. In the final stage, temperatures can be raised still higher but spreads should be closed again to a point where the easy-to-dry pieces will not be pulled down to an excessively low moisture content. The few stray high moisture content pieces will still be drying in this final setting.

The time on this type of schedule will be longer than normal but, as a whole, the stock will look good and generally meet most requirements except the most critical.

This principle can be used to advantage in drying mill run mixtures of one species, the only modifications being those made to meet the specific needs of the species being dried.

One important principle is shown here:

Where sorting can be restricted to one item per schedule, often great gains can be made in schedule building. Savings are made in total elapsed time and ranges in final moisture content can be reduced. Where mixtures must be dried together, fast schedules with high final temperatures and low humidities can be expected to produce many bad effects. The overly dry heart will be difficult to mill without considerable degrade. The black knots in the common and select alike may be considered as normally loose with many falling out and leaving knot holes. The slow-drying portion of the mixture will show many heavy pieces where sap or slow-drying sinker have failed to dry at the fast schedule. Schedules advanced for the majority of the stock may season check severely the portion still above fiber-saturation point when the schedule advance was made. If such stock is conditioned, the heavier pieces will still be drying at this stage and stresses will not be relieved. This case is not an isolated one. I have spent the time telling this case history because these conditions become more frequent as the years pass by. Each succeeding season brings us more and more of such drying difficulties. Many operators are being pushed into these situations. Surely no one would deliberately choose to dry lumber in these mixtures. We are forced to try to make the best of a bad situation.

Perhaps you have other means at your command to avoid these situations. Take a page from the experience of some of the mills in the Inland Empire. Here, Fir and Larch grow together in the forest. For years these have been harvested together, dried and marketed together. This has been mainly a marriage for convenience because in some ways the woods are very dissimilar. They certainly dry very differently. The butt logs of many Larch trees are of sinker type. Dried as dimension with the Douglas Fir, the Larch has hardly started to dry when the Fir is dry enough to market. The trend now is toward cutting the Larch to 4/4 and the Douglas Fir to dimension in those areas. In this way it has been possible to do a better job in drying both of these species. Eventually we will raise the values of both species above those developed under present handling methods.

This same principle can be applied to other woods. In the White Fir, the sinker can be dried separately from the corky. Sugar Pine sinker should be dried by itself in order to avoid including wet lumber in the shipping order. Too long a drying time is needed for such items. You cannot afford to hold up the charge for them. Included as a mixture they are generally damaged as well as being too wet to market. Cut Sugar Pine sinker to 4/4 and 5/4 thicknesses only. Cutting such items to these thinner sizes speeds up their drying rate immensely and quite often will raise the value of such items, for this sinker stock is of fine quality when properly dried.

If it is possible for you to further sort your lumber by drying rate or by the end moisture content desired, so much the better. Most of you have seen the speed that can be gained by separating these difficult to dry items. Sap common Ponderosa is ruined, surely, when dried at a typical select schedule and select

final moisture content. Lower temperatures save the knots and higher final moisture content gives better machinability. Ponderosa Pine heart common can be dried at lower humidity than would be possible on shop and select. Stock intended for paneling must be dry. Separate this from the common for special drying care or be prepared for the degrade which follows over-drying. Your sales force should be shown the extra price that knotty paneling must bring in order to compensate for natural loss which develops in drying lumber to extra low moisture contents.

If you have items which season check easily, like Fir or Larch clears, it is poor drying economy to put them with an item which can stand lower humidity. If you have only a small amount of this item, do not put it out in the weather on stickers while awaiting enough for a charge. To do so is to invite such severe season check that this clear stock might better have been left in the common board grades or dimension because it will lose most of its extra value by degrade due to season check. Some mills use water sprinklers or fog nozzles to keep Fir and Larch (non-staining species) from drying out while awaiting the accumulation of enough for a kiln charge. Pre-air checking is prevented thereby. The least that can be done would be to leave the lumber in solid package until ready to charge in the dry kiln, then stick and charge as quickly as possible.

Through the years we have seen schedules come and schedules go. Many of you may have been tempted to try John Doe's schedules in the hope of gaining production speed through your plant. Many schedules which work well where lumber can be segregated properly are failures where mixtures abound. If time is to be gained by making schedule changes at an established moisture content, you will have to know whether your stock is uniformly down to that point or reap the damage done to the portion still too high in moisture content to stand the schedule advances. If the proportion of high ones is small, it may be poor economy to wait for them. It would then be better to accept some degrade in that portion than to hold up the entire charge.

For that reason, if for none other, kiln operators are having more and more difficult decisions to make as we add more species to our production schedule. You cannot sort everything that comes along. You would have too many jags setting around which would increase your problems no end. Only by a mutual exchange of ideas can we hope to solve all these sorting problems in your plant. That is why the kiln clubs are growing in value from year to year.

How will you determine the proper methods by which to segregate? One thing is certain, your problem cannot be decided overnight. Only by careful study of your own cutting methods, drying equipment, sales methods, plus many other factors can you come up with the answers.

Share your problems with each other. Ask your Association staff. It is much easier to work together as a team.

Let us review some of the sorting methods which may be used:

1. First in importance is probably the sorting of logs. By cutting one species at a time we increase the number of sorts as many fold as the species we are cutting. The increased cost of labor at this point is more than offset by the gains to be derived.

2. Restrict the number of thicknesses cut at one time. Determine the cutting needs in advance, however, so that the stock can be balanced to the orders on hand. Cutting all thicknesses at once brings confusion and reduces the number of drying sorts possible.

3. Whenever possible sort the green lumber to drying rate rather to grade and width. In this way both drying time and final moisture content uniformity can be gained.

4. Use the rough dry sorter to segregate the lumber to separate widths, lengths, and grades. Any high moisture content pieces can be sorted to advantage at this stage. After redrying they may generally be salvaged and placed back into the regular grades. Without a dry chain, these wet pieces go through the planer before being spotted by the grader. When culled after surfacing and redried they have shrunk to below standard sizes and are not salable except as culls.

5. Separate the sinker, to be dried either by itself in the dry kiln or, better yet in most instances, in the air seasoning yard.

6. Cut sinker to thin sizes, 4/4 or 5/4.

7. Cut the Larch to boards and the Douglas Fir to dimension rather than mixed as dimension.

8. Sometimes it is possible to dry two charges of 4/4 heart Ponderosa Pine common with one of 4/4 select. In a double-track kiln, place the shop and select on one track and the common on the other, pulling and recharging the common somewhat past the middle of the schedule.

9. In a single-track kiln, the same idea can be sometimes used by placing the common at the door end where kilns are loaded and unloaded from one end.

10. On a double-ended single-track kiln, place the common lumber to be dried on the dry end. When the common is sufficiently dry, discharge these loads, shove the shop and select on down to the dry end. Then put more loads of common in the space behind them and pull this second batch at the same time with the shop and select.

11. Idaho White Pine 12 inch may contain much water core which must be dried longer to compensate, or can be air dried. The sinker stock of White Fir, Sugar Pine or other species can also be handled this way.

Meet your responsibility as a dry kiln operator by using every means at your command to turn out a quality product. Take advantage of the saving in drying time that segregation will give you to increase your production. If your manager can be shown the dollars and cents value of these ideas, I am sure that you will find him most cooperative. In the future as our markets become more and more critical, we are going to need even more segregation.