Grain Hay And Pasture

In The Columbia Basin

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GRAIN hay acreage, in the days of horses, comprised about 15% of the crop acreage in the Columbia Basin. Strips around fields, areas likely to "burn," and fields near the barn were cut for hay. Mechanized farming reduced the need for hay, and in late years small combines and self-propelled combines have eliminated the need for cutting around field borders.

Now, with grain hay allowable on diverted wheat acres, there is revived interest. Oregon has about 340,000 diverted acres. Those who overseed acreage allotments of wheat are particularly interested, because the excess acreage must be cut for hay or silage, or must be pastured off, or destroyed in order to avoid penalties imposed by law.

Acreage allotments are not new, having been imposed in 1938, 1939, 1940, 1941, 1942, and 1950. In addition, we had diverted acres under the former law in 1934, 1935, and 1936. In those years also, there was an upsurge in grain hay acreage. Table 1 gives some records by years.

Table 1. GRAINS CUT FOR HAY, BY YEARS

County	1929 Census	1934 Census	1939 Census	1944	1949
	Acres	*Acres*	*Acres*	*Acres*	*Acres*
Gilliam	6,166	15,451	5,061	3,463	4,386
Jefferson	7,199	4,267	3,255	4,430	2,044
Morrow	11,597	19,828	8,152	5,762	4,294
Sherman	5,431	18,608	8,455	3,896	4,213
Umatilla	21,163	29,411	13,756	9,837	9,004
Union	6,060	7,752	6,297	4,382	3,284
Wallowa	13,899	21,083	15,352	11,940	9,037
Wasco	15,020	20,547	10,648	9,445	6,794
Wheeler	9,655	11,332	7,707	7,269	6,108
Totals	96,190	148,279	78,683	60,424	49,194

This shows a variation of almost 100,000 acres between low acreages in good years with no wheat diversion called for, such as 1949, and high acreages in drought years with diverted wheat acres in the picture, such as 1934. Drought and diverted acres both result in high acreages of grain hay in the Columbia Basin.

Cereals for Hay

Yield. Fall wheat and fall rye normally will outyield spring grains for hay. If spring seedings are necessary, these things are important:

- √ Spring barley matures more quickly than oats or wheat, hence can be seeded later. It is more likely to make a crop on thin, dry soils, or in years lacking subsoil moisture.
- √ In years with plenty of subsoil moisture, either wheat, oats, or rye is likely to outyield barley.
- √ For deep, rich soils, north slopes, moist bottom lands—use oats. They are adapted to good conditions.
- √ For sandy lands, low in organic matter, use rye.

Quality. There is more difference among varieties of the same grain than there is among grains. Oats average higher in percentage of leaves, however, followed by barley, wheat, and rye in that order. In general, the grain varieties that are the leafiest make the best hay. Also, the varieties that tend to lodge make the best hay. Modern varieties, bred to stand upright for combining, make poorer hay than the old fashioned kinds that "went down" in good years.

It is doubtful if there is enough difference in hay quality among the wheat varieties now grown to justify any search for a particular variety.

Time of Seeding

Fall-seeded wheat or rye will usually beat spring-seeded grain of any kind. If spring seeding is necessary, oats or rye can be seeded earlier than spring wheat or barley. Barley can be seeded latest of all. Late planting, however, affects hay yields even more than grain yields. Seed as early as possible in the spring.

Rate of Seeding

If the crop is to be used for hay, sow 25% to 50% more seed than is used for grain. Hay will be better quality, weeds will be less of a problem, and the soil surface will be covered more quickly. If seeding is late, such as late April or May, do not increase seeding rate except under irrigation.

Weed Control

Control of weeds is less important in a hay crop than in a grain crop because:

- √ Hay is cut earlier, so weeds do not rob the crop of moisture so completely.
- √ Many weeds have some feed value if cut early.
- √ The hay crop is often taken off before the weeds go to seed.

If the crop is full of early maturing weeds, spraying is a good practice to keep the seeds from contaminating the field and to keep the weed seeds out of the hay. Some weeds, such as cheatgrass, may make it necessary to cut the hay early to prevent low quality.

When to Cut

At the Sherman Branch Experiment Station, Rex, Rio, and Golden winter wheats were cut at five stages: head in boot, starting to head out, part bloom, early milk, stiff dough. This was repeated for 4 years—1942 through 1945.

Differences among varieties were not great, so only the 4-year averages are reported in Table 2.

The astonishing thing about this is that when the wheat was not yet completely headed, it had almost as much protein *per acre* as it had at any later stage. In bulk, though, it put on an extra ton as it developed. Whether the extra ton would be worth waiting on would depend somewhat on the use intended for the hay.

During the same years two varieties of spring wheat, Federation and Baart, Meloy barley, and Carleton oats were cut at three different stages of maturity: first heading, kernels nearly formed, and stiff to hard dough.

Comparative hay yields, per cent protein, and pounds of protein produced by the four kinds of grain hay at three stages of maturity are shown in Table 3.

Winter wheat during this period gave higher hay yields than did any

Table 2. Per Cent Dry Matter, Hay Yield, and Protein Content of Winter Wheat by Growth Stages

Stage of growth	Dry matter	Hay yield per acre	Protein content	Protein per acre
	Per cent	*Pounds*	*Per cent*	*Pounds*
Head in boot	29	2,500	8.9	215
Not fully headed	35	3,549	6.7	232
Part bloom	44	4,585	5.3	243
Early milk	52	4,958	5.0	246
Stiff dough	68	5,538	4.7	264

Table 3. Comparative Per Cent Dry Matter, Hay Yield, and Protein Content of Spring and Winter Grains by Growth Stages

Stage of growth	Kind of grain	Dry matter	Hay yield per acre	Protein content	Protein per acre
		Per cent	*Pounds*	*Per cent*	*Pounds*
1st heading	Winter wheat[1]	29	3,549	6.7	238
	Spring wheat[2]	28	2,635	8.5	224
	Meloy barley (Spring)	26	2,657	8.2	218
	Carleton oats (Spring)	28	2,521	8.8	222
Kernel nearly formed	Winter wheat	44	4,585	5.3	243
	Spring wheat	48	3,786	6.5	246
	Meloy barley	40	4,394	6.0	264
	Carleton oats	47	3,721	6.8	253
Stiff to hard dough	Winter wheat	68	5,538	4.7	260
	Spring wheat	82	4,816	5.9	284
	Meloy barley	70	4,725	5.7	269
	Carleton oats	75	4,667	6.4	299

[1] Average of Rex, Rio, and Golden varieties.
[2] Average of Federation and early Baart varieties.

of the spring grains. But the winter wheat gave a lower percentage of protein. The yield of protein in pounds per acre was about equal for all kinds of grain hay and for all three stages of maturity.

Grain hay should be cut before the green coloring begins to disappear, as the color is associated with the palatability and nutritional value of the hay. If one waits until grain is formed it simply means that the protein is taken out of the straw or hay and concentrated in the grain.

A recommended time to cut grain hay is after the bloom and before the grain starts to form. At this stage a near maximum tonnage is obtained and you have a nice, green-colored hay relished by the cows. In feed value it is also superior to older hay, although not so high in protein as younger hay.

If the hay is to be fed to dairy cows, to fattening steers, or to ewes, the higher protein in the early hay will offset the increased tonnage. In other words, for those uses, cut grain hay very early.

If the hay is for horses, or for maintaining weights on beef cattle, it is better to cut as the kernel is forming. Protein down to 5% is getting toward the danger point, and if low protein hay is fed to dairy cows, ewes, or fattening stock it must be supplemented with some higher protein feed. Protein is usually the highest priced article on the feed list and if you can grow it at home, your pocketbook will be grateful.

Bearded grains should always be cut early and so should rye. It is important to cut rye before the stems get too much like broom straw. In the case of bearded grains, the beards begin to get bothersome if the grain is past the early milk stage.

If the hay is for sale, it is important to cut fairly early in order to keep the green color. Buyers shy away from straw-colored hay unless they can get it at straw prices.

There is very little gain in hay weight if any of the cereals are cut beyond the kernel forming stage, because the lower leaves start dropping.

Palatability

Stock of all kinds almost seem to know protein is good for them. Other things being equal, they will always eat the earlier cut hay first. If all cereals are cut at the same maturity, livestock usually will choose hay of oats, barley, wheat, and rye, in that order.

When grain is being fed, the stock will usually prefer a grain hay of a different cereal. Thus, if the stock are getting barley for grain they will choose wheat or oat hay; if they are getting oats, they will prefer barley or wheat hay.

Drying

The shorter the time between cutting and stacking, the less the danger from rain. Rain is usually the villain in the hay drama. But the hay must lose a lot of water. It has about 70% water if cut at heading time and 55% if cut at the time the kernels are forming. This water content must drop down to about 15%. Rain in the swath is less damaging than rain in the windrow. But if left in the swath too long, hay bleaches, and if raked too dry, the leaves live up to their name and leave. So the farmer has to take his choice, balancing danger of rain against quality. Three-day weather forecasts may help.

Haying Machinery

Labor costs in haymaking vary enormously with harvesting methods. Costs are lowest in the first method below and tend to increase with each method listed.

Field chopper
Combination buck rake—stacker
Buck rake with slide stacker
Buck rake with sling or fork
One man pick-up baler
Other pick-up balers
Hay loader and truck
Pitch on and unload by sling or fork
Pitch on and off
Binder

The cost of labor isn't the only thing to consider, though. Field-chopped or field-baled hay must be drier than hay put up loose. If a man has only a few tons of hay, he probably should use the equipment at hand. Quality of hay differs with different methods. For example, use of a buck rake on loose, cloddy ground results in very dirty and dusty hay. This is particularly true of hay from spring grain.

Silage

Rather than buy full scale equipment for hay, many wheat farmers might consider silage, either long or chopped. A trench or stack costs very little. Here are the advantages:

- √ Crop can be cut early, no matter what the weather is—thereby getting high protein.
- √ Early cutting stretches labor better.
- √ If crop is weedy, the juices intermingle, often enabling one to get some feed from weeds.
- √ There is virtually no weather hazard.
- √ The field chopper also can be used for hay or straw.
- √ Silage is more like pasture if cut early, so is better than hay for August to September feeding.

For high-protein, early-cut feed, silage enables you to disregard weather.

Fertilizer

In late years, use of nitrogen on wheat has boomed in the Columbia Basin. It is the most spectacular of all the new developments. Whether it will swing its own weight or not when the wheat is used for hay is a different problem. Several factors are involved. First, nitrogen usually increases hay yields more than grain yields. Ten dollars worth of nitrogen will usually make an extra ton of hay to the acre—even if it doesn't increase grain yields. Second, the extra ton of hay is standing and it costs $6 to $8 to get it cut and stowed away.

About 40 pounds of nitrogen to the acre on summer fallow should be about right, or 60 to 80 pounds per acre if recropping. It should be put on in the fall before seeding, or very early in the spring as a topdressing on fall-seeded grain, or early in the spring for spring grain. Late applications in a dry year will not pay.

If the owner has no use for the hay and is regarding it as a necessary evil, he doesn't want any more of it than is necessary. But, if hay is scarce in the neighborhood and will have a ready use, then it may be worthwhile to get more of it through nitrogen.

Cereals for Pasture

This discussion is based on the assumption that the grain will be used entirely for pasture, and that there is no intention to withdraw the stock and thresh the grain later.

Yields of pasture are normally in this order: Fall rye, fall wheat, spring rye, spring wheat, oats, barley. Barley will outyield the other spring grains, however, if it is spring-seeded in a dry year.

Yields of cereals for pasture normally will be less per acre than if cut for hay. The cereals have been bred to grow in an unbroken pattern from emergence to harvest and if a person cuts them off, as in pasturing, yields are reduced. If one can count on 2 tons of hay, then probably he can't count on much over 1 ton of yield from pasturing.

But, as in early cut hay, the pasture is far more nutritious than most grain hay. Each ton of pasture (dry basis) produced should turn off about 170 pounds of beef or its equivalent.

Since young grain is rather laxative, many farmers like to have a supply of dry feed (hay or straw) available in the field so the stock can eat a little of it when they choose. They do not need any protein supplements, since the young grain usually analyzes 20% protein in the early spring, and about 10% in the late spring toward the end of the pasturing season.

With a combination of fall-seeded grain, spring-seeded spring grain, and spring-seeded fall grain, there is pasture almost all summer. Yield of pasture per acre will also be in that order, with the larger yields in the spring.