

ALFALFA CUBING

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Waukena

Hay cubing is one part of our farming operation (M. Curti and Sons). At present we own and farm 2800 acres of land. Most of this land is planted in alfalfa, barley, oats and corn for silage, grain and cotton. The alfalfa crop usually includes from 600 to 900 acres, depending on the crop rotation. In addition to crop farming, we operate an 800-cow dairy and raise all of our own replacement heifers.

Practically all the feed grown on the farm is consumed by our herd. The only crop we market is cotton. Prior to cubing the alfalfa in our operation all the hay was field chopped, either dry or green. Very little hay was baled.

Chopping dry hay was not the best method to handle this roughage, so we began to look for a better one. It was almost impossible to stack and store the dry chopped hay without heating and often times resulting in spontaneous combustion. Another disadvantage of chopping hay is the dust. These are the reasons we decided to change to cubing the hay.

We began our cubing operation in June, 1968. A wafer machine was tried five or six years prior to cubing, but it was not practical. The hay had to be shredded and laid in a windrow before wafering. The capacity of the machine was very low compared to the cuber.

In June 1968 we purchased a John Deere 400 field cuber, after a 30-day trial. That year we cubed approximately 4,500 tons of alfalfa hay. This was at an average rate of nearly five tons per hour. In 1969 we continued to operate this cuber and cubed almost 6,500 tons, which is the largest tonnage for one machine that we have processed in one year. In order to do this the cuber had to run from 18 to 24 hours per day when hay was available and weather permitted. One reason for more tonnage in 1969 over the previous year was that we had the cuber for a full season and started earlier.

In the year 1970 we started with the same machine, but after some thought and study, we purchased a second cuber in May. Also, the demand for cubes was increasing. In August of the same year we purchased the third unit. This decision was made for two reasons. First, we had more hay than two cubers could handle. If the equipment is already taxed to capacity and one unit breaks down, you are suddenly behind schedule a couple of days. You can appreciate how irritated the grower can get. Second, three units are more efficient in labor and investment. Three cubers are the minimum for good efficiency in our operation, but more units may be more efficient for other operations. Regardless of whether one or more cuber is used you must have a water truck, a service truck and at least one pickup. Also, with three or more cubers it is possible to employ a higher caliber service and maintenance man.

At the beginning of the 1972 season we decided it was necessary for us to have some accurate facts and figures on this operation. As you well know, it may appear that a profit is being made without figures to substantiate it. In 1971 and 1972 we operated three cubers for the full season. The total cubes produced in 1971 was a little over 16,000 tons. The amount of acreage in our operation would only justify one cuber, so we harvest about two-thirds of the cubes for other dairymen on a custom basis. We also purchased some hay standing and harvested it.

The total tonnages harvested in 1972 were:	Alfalfa hay	12,870.58
	Beet tops	526.07
	Total	13,396.65

Hay cubing costs for 1972 were:

Labor	\$ 1.259 per ton
Fuel oil and grease	.284 " "
Repairs and supplies	1.402 " "
Depreciation	2.353 " "

Taxes	.149 per ton
Interest	.598 " "
Overhead	.554 " "

TOTAL COST \$ 6.599 per ton

In calculating the overhead cost 10% of the entire operation was used. This may be somewhat high, but there must be a management charge in addition to other overhead costs. Interest and depreciation were figured on \$120,000 investment even though our cubers were of the following ages: 1, four years old and 2, almost two years. This may be high, because the actual value of the cubers was probably somewhere between \$60,000 to \$70,000. The pickup unit on the 4-year old machine was changed to a new unit. The three units had to be repaired completely and new dies installed at the beginning of the 1972 season.

These costs in our operation may differ somewhat from a straight cubing operation. Most of our cubing is done in a radius of 8 to 10 miles from our headquarters. Most of the fields are quite large which means less moving time on the road and this is a big advantage. We try to pick up the smaller fields to harvest while moving from one large field to another.

Now what are the advantages and disadvantages?

When hay cubing was first being explored in our area, operators or advisors led us to believe hay preparation for cubing had to be handled somewhat differently than for baling. But the more we learn about handling hay, we find there is very little difference, if any. The land does not have to be any drier than when preparing for baling.

Unless the production of a field is approximately two tons and over, the preparation of hay from swath to windrow is handled the same as for baling. Two swaths should be rolled into one if production is over two tons. If drying conditions are not good, it is better to turn the one windrow even though production is less than two tons. Curing time when weather is good is no longer than for baling..

When the hay is cubed, there is nothing left in the fields. The irrigation can be started shortly after cubing. It is getting more difficult to get the bales hauled out of the fields unless they are harrow-bedded out. Labor saving is certainly the big advantage in cubing hay.

Cubed hay must be dumped on a slab and cured for ten days to two weeks before it is piled in a stack. Baled hay must be stacked along the roadside for transportation. This requires extra labor over cubes, because cubes are loaded with a skip loader and no manual labor is required.

Some growers will not have a cuber in a field because of compaction. This may be true to some extent, but it is not that bad. The thing that is undesirable about a cuber on the land is that it travels the same path every time it goes over a field. The swather travels the same path and when raked together, the windrows are in the same path. This is noticeable in some fields and especially if the ground is wet. Some of this has been eliminated since the floatation tires have been installed on the front of the cuber and the cuber wagon. As nearly as we can tell it has not affected the yields on our fields.

Hay cubing has another advantage in our region because winds blow continuously at times in May and June, which makes it ideal for cubing. There is no dew, and we can sometimes operate around the clock if it is possible to keep operators on the equipment. Weather conditions such as these make it possible to make the most desirable cubes. It sometimes keeps hay balers out of the fields for two or three days at a time. In the reverse, it is not possible to cure hay well during the first and last cuttings. It is possible to bale it, even though it may be difficult to make a good bale.

In our operation we make silage out of the first and last cuttings. This is the best way for us to handle it. The hay is off the field in a couple of days, with no risk or gambling on the weather.

The original cost of the cuber is a disadvantage over the cost of a baler. The

number of tons per hour is considerably lower than with a baler. The cuber kept in good running order and with favorable conditions will cube seven or eight tons maximum or an average of approximately five tons. I have heard that some balers will bale up to 20 tons per hour, but have no idea what they will average per hour. Cubers can operate many more hours per day than a baler.

Grassy hay is difficult to cube, and does not make a desirable cube when there is 10 percent or more grass in a field. Coarse hay and old hay is more difficult to cube and doesn't make a good cube either. The ideal hay for cubing is a good leafy hay with a fine stem. There is no problem to make a good quality cube with this type of hay. Oat hay cannot be cubed. It must be baled. A cuber requires more maintenance service and possibly more skilled operators than a baler. The key to a successful cubing operation is a good maintenance man and qualified operators. There is more "down time" on a cuber than a baler.

The cost of hay cubes layed in a stack or on a slab is certainly higher than baled hay, so a consumer should expect to pay three to four dollars a ton more for cubed hay than baled hay. The advantages of cubed hay over baled hay will off set the additional cost. First, it saves in the cost of handling. Labor becomes more and more of a problem in any operation. Being very conservative, I would say one man can feed as many cattle with cubes as it would take four men or more to feed baled hay. Less storage space is required for cubes. We figure that it only takes about one-third as much space for cubes as for the same tonnage of baled hay.

If cubes are not overfed, there is no waste. From my observation the condition of a cow is better when fed cubes. I think the reason for this is the cow eats stems and all, and therefore she gets all the constituents from the hay. Hay consumed in cube form does not increase in food value as we are sometimes led to believe. No matter what form hay is harvested, it still takes good quality hay for good quality cubes. Cows fed good cubes will consume slightly more than baled hay.

Hardware in cubes is sometimes a problem. This is not a problem to us, because we do not have balers in our fields. A cuber operating behind a baler where wire is scattered in the field will certainly cause a hardware problem to the cattle receiving the cubes.

Consumers who have tried cubes sometimes discontinue, because the cubes are of poor quality. There have been cases where a seller will blend good cubes with poor cubes. This may be to his advantage at first, but it is impossible to fool the consumer long - and especially that old dairy cow.

A complete ration of only cubes and grain will not be successful on a dairy. A straight cube roughage will depress the fat content of milk. If cubes are fed as roughage without silage, about 10 percent of the roughage should be fed as baled hay or some long hay. The ideal combination is to feed cubes and silage for roughage.

We have done some cubing of beet tops, but it was not very satisfactory. There needs to be some changes made in the types of conveyors and elevators to handle this material satisfactory. If the beet tops can be purchased at a reasonable price, it may pay to cube them. One advantage is that it can fit in at the end of hay cubing season when the dies are worn. I certainly would not recommend cubing beet tops with a new set of dies.

Hay cubing in this area is increasing at a steady but slow rate. If it were possible to manufacture a cuber with increased output, it would, in my opinion, increase hay cubing more rapidly. Eventually most hay must be handled with a minimum of labor so hay cubing is here to stay. It is the same as any other mechanization; at first it is slow to start, but eventually is used by the majority of operators. The same thing happened with the mechanical cotton pickers. At first the growers were very skeptical about them, but now all of our cotton is harvested by machine.

In closing I want to say that we are satisfied with cubes in our operation, and it was a change that proved to be economical.

Curti & Sons Dairy
Waukena, California



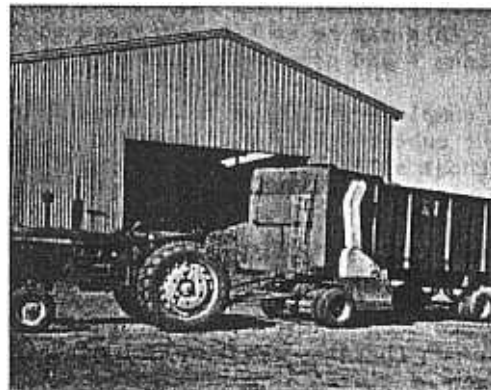
Hay Cuber



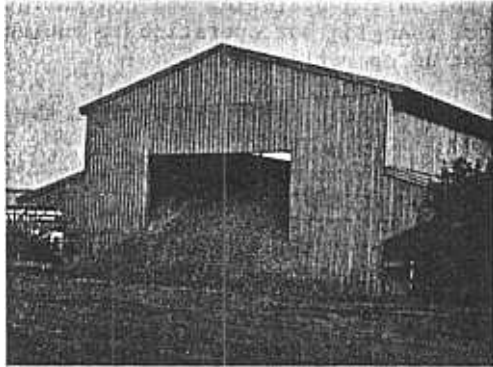
Unloading alfalfa cubes on slab to dry.
Cubes are loaded into truck from cuber wagon.



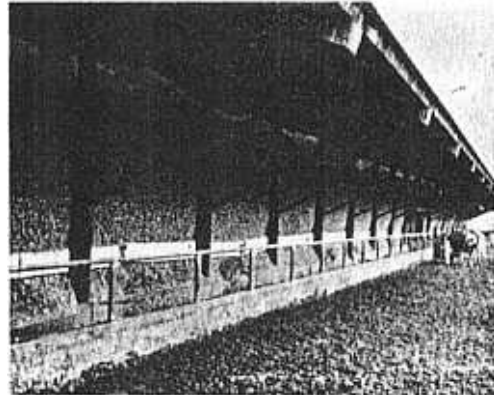
Loading cubes from the slab for feeding
to dairy herd.



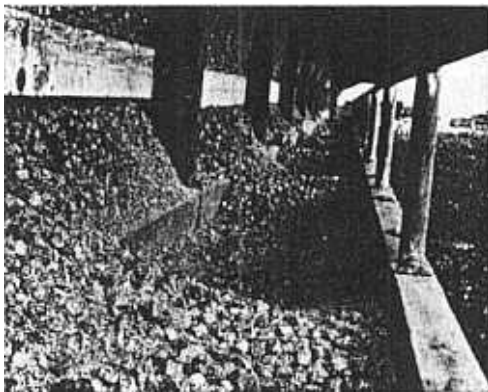
Tractor and automatic feeder wagon for
alfalfa cubes, silage and green chop.
Note alfalfa cube storage shed in back-
ground.



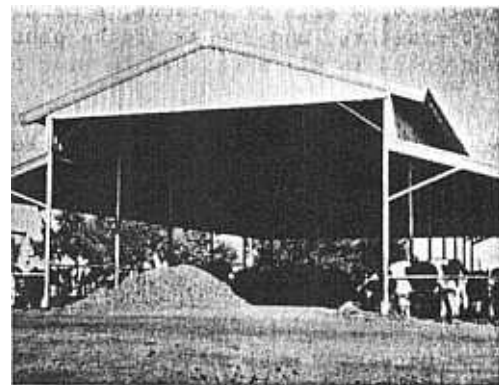
End view of storage shed filled with alfalfa cubes. Mangers in feeding sheds on each side of storage shed used for feeding cubes to part of herd.



Feeding shed and manger on side of alfalfa cube storage shed.



Manger on side of storage shed with alfalfa cubes ready for feeding.



Feeding shed and alfalfa cubes for young stock calves feed on three sides of shed.