

# MARKETING STANDARDS FOR SOUTHERN CALIFORNIA GRASS EXPORT HAY

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## ABSTRACT

Grass hay exports are an important sector of the agriculture of the irrigated Sonoran Desert. These grass hays are exported to the Orient from West Coast ports. Bermudagrass, kleingrass, and sudangrass are the grass hay crops that are exported. The grading standards for these grass hay exports are quite variable and very subjective. Some of the primary determinants of export hay grades are color, weediness, stem size, texture, plant maturity, and rake. These visual attributes of hay grades are all subjective. Other than NO<sub>3</sub> determinations, which are required for sudangrass hay transactions, the present grass hay grading standards do not require any chemical assessment of hay quality. To further cloud the issue, the final country of destination may have its own set of standards. Different hay trading companies from the same country may have different hay grading standards. Different geographical areas of the same country may also have differing hay preferences. The lack of a defined, uniform grass hay standard in California, makes the production of consistent export quality hay by California growers quite difficult.

**Key words:** hay grades, bermudagrass, kleingrass, sudangrass

## INTRODUCTION

Throughout the US, the standards for the marketing of alfalfa hay are clearly defined. The different states have different alfalfa marketing standards. Most states use the *Relative Feed Value* concept as the principal determinant of alfalfa hay grades. The *Relative Feed Value* (RFV) of hay is calculated from two chemical determinations, the *Neutral Detergent Fiber* (NDF) and *Acid Detergent Fiber* (ADF) values of a hay sample. In addition to RFV, some states also require the ADF value for the determination of alfalfa hay grades. Many western states require RFV, ADF, and the crude protein (CP) value of a hay sample to determine the alfalfa hay grade (USDA, 2001). Besides these chemical attributes of the hay sample, visual appraisals of mold, color, softness, and weediness are also determinants of alfalfa hay grades. In California, the only chemical analysis of an alfalfa hay sample that is required is the ADF value. From the ADF value, the *Total Digestible Nutrients* (TDN) value is calculated. Besides the aforementioned visual attributes, in California, ADF and TDN determine alfalfa hay grades (UCCE Alfalfa work group, 2001). The hay grade standards for grass hays are not so well defined. Throughout most of the US, the only chemical analysis of a grass hay sample that is required is CP. Additionally, the same aforementioned visual attributes of the hay sample are also required for the determination of grade. In many states, the following table describes grass hay standards (USDA, 2001).

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Hay grade	CP %
Premium	>13
Good	9-13
Fair	5-9
Low	< 5

In the year 2000, in Imperial County, 42,059 acres of bermudagrass (***Cynadon dactylon*** L.) and 55,045 acres of sudangrass (***Sorghum vulgare sudanense***) were grown (Imperial County Agric. Commissioner, 2001). Additionally, about 20,000 acres of a new grass, kleingrass (***Panicum coloratum*** L.), are grown in the Imperial and Palo Verde Valleys and in Arizona along the Colorado River. Most of the hay from these three grasses is exported to the Orient. There is no single set of grass hay grades that apply to the marketing of these hay products. Each grass hay has its own standards, and depending on the country of final destination an additional set of grades apply. Further complicating the hay grading issue, is that different commodity brokers from the same country may use differing company grades.

The following descriptions of grass hay grades for export, were obtained from the interviews of several Imperial Valley hay brokers. The hay brokers that were interviewed export more than 1/2 of the hay exported from the Imperial Valley. The following description of grass hay standards for exported hays from the irrigated Sonoran Desert is a *generalization/amalgamation* from the description of hay standards from several Imperial Valley commercial hay brokers. Since hay grading standards are largely determined by proprietary arrangements between the exporter and the importer, the following *generalized* grass hay standards may not apply to any one grass hay transaction.

### **BERMUDAGRASS**

Originally, In the Imperial Valley, common bermudagrass was grown as a seed crop, hay and straw being secondary products. Over the last several years, bermudagrass hay has become increasingly important for Imperial Valley growers as an export crop. Common bermudagrass has several marketing options. Firstly, if the price of seed warrants bermudagrass seed production, seed production may be the desired production option at the first cutting. Straw is a byproduct from seed production. Bermudagrass straw may be sold on the domestic market for dry dairy cows or for beef feedlots. Bermudagrass straw is also exported for dry cows and for beef feedlots. Depending on the annual price of seed, 1/2 of the local acreage may be allocated to bermudagrass seed production. About 10 to 15% of the bermudagrass acreage is allocated to the production of domestic horse hay.

In the irrigated Sonoran Desert, the primary objective in making bermudagrass hay is the export market. Bermudagrass hay has three general grades; A, B, and C. Within each grade there is a further differentiation into a +, 0, or – grade; eg. A+, A<sub>0</sub>, or A-. The principal factors that determine bermudagrass hay grades are fiber length, texture, color, rake, and weediness. Bermudagrass hay that does not meet the C grade, is diverted to the domestic market. Bermudagrass hay grades do not require any chemical analysis.

Grade	length	texture	color	rerake	weeds
A	8"	Soft	Green, Consistent	No	No broadleaf, No watergrass
B	8"	Soft, few Hard stems	Lighter green, Consistent	Some	Weed free Permissible
C	10" or <8"	Many hard stems	Light green	Some	Some watergrass domestic (not horse hay)
D	18"	Hard stems or brown	Bleached,	Yes	Visible watergrass

The term *rerake* may be new to some symposium participants. Not all cured hay in the windrow is picked up by the baler. Some hay remains in the field, at ground level, gets wet during flood irrigation, and eventually turns brown. At subsequent balings, this off-color hay may be picked up by the baler and mixed into the fresh, green hay. This *rerake* discoloration severely diminishes hay value.

Bermudagrass hay is becoming increasingly important in the domestic horse market. Firstly, all bermudagrass hay bales going to the domestic horse market must weigh from about 75 to 100 lb, light bales. Common bermudagrass is not desirable in the horse market, giant bermudagrass because of the longer fiber length is more desirable. Bermudagrass hay for the horse market must be green in color and contain no weeds.

### KLEINGRASS

Kleingrass is a relatively new crop in the irrigated Sonoran Desert, first being planted only about 6 years ago. Kleingrass hay is a new crop in the Orient with many reported palatability problems. In comparison, in the Southwest US, beef range cattle relish kleingrass pasture. About 20% of kleingrass hay, hay that does not meet export standards, goes to the domestic market. This kleingrass hay going to the domestic market, primarily to dry dairy cows and to beef feedlots, may contain weeds, be rained-on, be off-color, and contain rerake.

Grade	Weediness	Texture	Maturity	Color	Rerake
1+	<b>NONE</b> 1 <sup>st</sup> cut	soft,dry	no seeds	dark green to lt gm	No
1-	<b>NONE</b>	soft	no seeds	green to lt gm	No stems
2+	<b>NONE</b>	mostly soft	no seeds	light green	Minimal
2-	<10%	mostly hard	no seeds	light green, to bleach	Some

The primary determinants of kleingrass hay grades are texture, color, plant maturity, and most important of all weediness. Weed contamination will exclude baled kleingrass from the export market. Kleingrass export hay has two basic grades; #1 and #2. Each grade has two differentia-

tions; a “+” and a “-“, eg. 1+ and 1-. The color differentiations for kleingrass export hay within each grade may be classified as dark green, green, light green, bleach-, and bleach+. Bleach+ hay disqualifies the hay for export and is diverted to domestic feedlots.

Depending on the country of final destination, kleingrass hay grades differ substantially. Research reports from Texas have related that under certain growing conditions, kleingrass may contain potentially toxic amounts of *saponins*. In Texas, kleingrass has caused toxicity problems for sheep and for horses, but not for cattle fed the same kleingrass. These saponin problems have not been reported under the drier irrigated conditions of the Imperial Valley. No chemical analyses are required to grade kleingrass export hay.

## SUDANGRASS

Sudangrass has been cultivated in the irrigated Sonoran Desert for more than four decades. Even more so than for bermudagrass or kleingrass, the country of export destination determines sudangrass hay grades. It is quite natural to expect that each sovereign nation have its own set of commodity import standards. Hopefully these national commodity import standards would be published by some governmental agency and would be science based. To further cloud the issue, different regions within the same country may have differing market requirements. For example, certain areas of Japan prefer a “pink” hue in sudangrass hay. To produce this kind of sudangrass hay, the crop should be N deficient and thoroughly bleached; antithetical to high hay yields and certainly for the grower, economically dubious.

In the irrigated Sonoran Desert, sudangrass is grown primarily for export. Hay not qualifying for export is diverted to domestic markets. About 20% of sudangrass hay goes to the domestic market; primarily dry dairy cows, beef feedlots, zoos, and to Mexico. This domestic sudangrass hay is from later cuttings, may be green or dark green, weeds may be present, stems may be hard, thick stemmed, and may contain high NO<sub>3</sub> levels.

The primary determinant of export sudangrass hay grade is stem size. Stem size may be classified as very thin – a cell phone antenna, thin – a soda straw, medium – cigarette thickness, and thick – greater than pencil thickness. After stem size, the next most important grade factor is color. Color may be classified as light, medium light and standard (green) within each grade, the lighter colored hay being preferred. All hay brokers can distinguish between the hay color which results from N deficiency and from sun bleach. Sun bleached hay is not desirable.

Export sudangrass hay grades –

Premium – very thin stems, first cutting, soft texture, and NO<sub>3</sub> <1000 ppm

A+ -- thin stems, later cuttings, same as above

A -- medium stems, same as above

A- -- medium stems, some thick stems, same as above

B -- thick stems, harder stems

TMR grade -- green color, rake, weeds, thick stems

Other than NO<sub>3</sub>, no chemical analyses are required for export sudangrass hay grades. Export sudangrass hay grades are very subjective, by definition.

## **SPECIAL CONSIDERATIONS**

Bermudagrass, kleingrass, and sudangrass are tropical C<sub>4</sub> grasses which are well adapted to hot Sonoran Desert summers; for these grasses, the hotter the better. Some bermudagrass and kleingrass varieties, well fertilized may yield 10 to 12 tons of hay per acre per year. Kleingrass hay is a new and developing market, with many neophobia (fear of new things) problems in the Orient. The recent discovery of a single cow with BSE (mad cow disease) in Japan has been devastating to the Japanese beef industry. Japanese per capita beef consumption has plummeted. The demand for export quality grass hay from California has consequently declined.

## **CONCLUSIONS**

California grass hay exports have no single market grade standard as does alfalfa hay. Other than NO<sub>3</sub>, no chemical analyses are required for export hay grades, while in the US, chemical analyses are the bases for hay grades. Green, soft hay has always been prized by US livestockmen. For export hay, while green color is desirable for bermudagrass and kleingrass hays, green colored hay is undesirable for sudangrass hay, an apparent contradiction. Presumably there might be an association between hay color and NO<sub>3</sub> levels in sudangrass hay, but only well defined research results would quantify this possible linkage. Visual appraisals of stem size are subjective. The presence of thick, coarse stems which would add fibrousness to the hay lot, could easily be detected by the ADF analysis. California hay producers are at the mercy of ill-defined and subjective grass hay export grades with no regards to objective chemical analyses. Clearly the definition of objective, grass hay export standards by US scientists in association with Japanese and Korean colleagues, hay standards based on chemical analyses but still including some visual appraisals, would be beneficial for both the California hay grower and for the hay importer in the Orient.

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