Harvest Strategies for Alfalfa

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Chapter 13

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Harvest management decisions are critical to the profitability of an alfalfa crop. The timing of alfalfa harvests is the primary method by which growers can influence the nutritional quality of alfalfa hay. Additionally, harvest timing has a profound influence on forage yield and stand life as well as pest management, particularly weed infestation. It is difficult to overemphasize the importance of cutting schedules to alfalfa performance and overall profitability.

The Yield–Quality–Persistence Tradeoff

Deciding when to cut alfalfa is a difficult management decision. There are several tradeoffs involved, and no single cutting schedule fits all situations. Alfalfa yield and forage quality are almost always inversely related within a growth cycle. Alfalfa harvested at an immature growth stage (short interval between cuttings) results in relatively low yield but high forage quality. Conversely, cutting alfalfa at a mature growth stage (long interval between cuttings) results in high yield but low forage quality. This relationship of alfalfa growth and development is often termed the yield–quality tradeoff (Fig. 13.1), and is fundamental to understanding the influence of cutting schedules on alfalfa performance.

In addition to the yield–quality tradeoff within a growth period, cutting schedules influence the number of harvests possible in a year, thereby influencing seasonal yield and costs. Additionally, cutting alfalfa at immature growth stages shortens stand life and increases weed invasion due to the deterioration in plant health from frequent cuttings.

Alfalfa Growth and Root Reserves

To better understand the effects of time of cutting, it is helpful to review some principles of alfalfa growth and development (see Chapter 3, "Alfalfa Growth and Development"). Plant leaves use energy from the sun, through the process of photosynthesis, to transform carbon dioxide and water into carbohydrates. These carbohydrates (primarily sugars and starches) are translocated to the roots during the latter portion of the growth cycle (Fig. 13.2). These are commonly called "root reserves," and they provide the energy for initial growth in spring and regrowth after cutting. Protein and minerals are also stored in the root and crown of alfalfa plants in a similar fashion.

When active growth resumes in spring or following a cutting, the alfalfa plant relies on carbohydrates from the roots to support this growth until new leaves can photosynthesize sufficient carbohydrates to satisfy the needs of the growing plant. When growing nondormant alfalfa varieties in Mediterranean climates, this takes about 2 weeks after cutting, or until the alfalfa attains a height of 6–8 inches (15–20 cm). From approximately this point on, there is a net increase in carbohydrates, and the plant begins replenishing its root reserves. Carbohydrate reserves in roots and crowns increase with plant maturity, until full flowering of the alfalfa. Cutting alfalfa at excessively immature growth stages, which occurs when cutting intervals are very short, does not allow enough time for the alfalfa to replenish root reserves (Fig. 13.3), and the vigor of subsequent new growth is affected. Stand life may also

FIGURE 13.1

The yield–quality tradeoff for alfalfa hay. Over a growth period, yields increase while forage digestibility declines. This dataset is from Yolo County, CA, 2 years, spring, summer, and fall cuttings, which accounts for the "scatter" of the data, but the fundamental relationship can be seen.

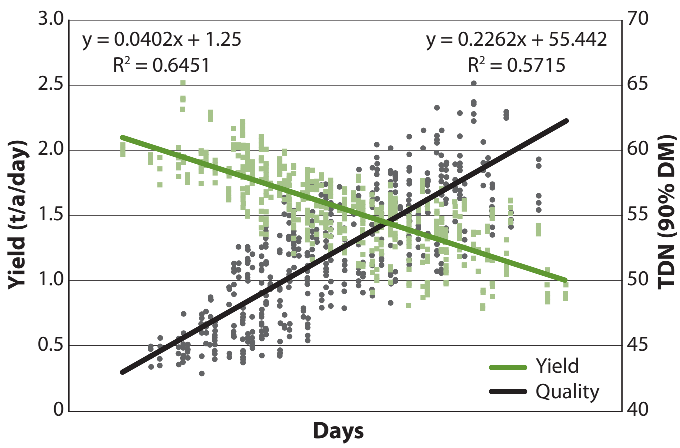
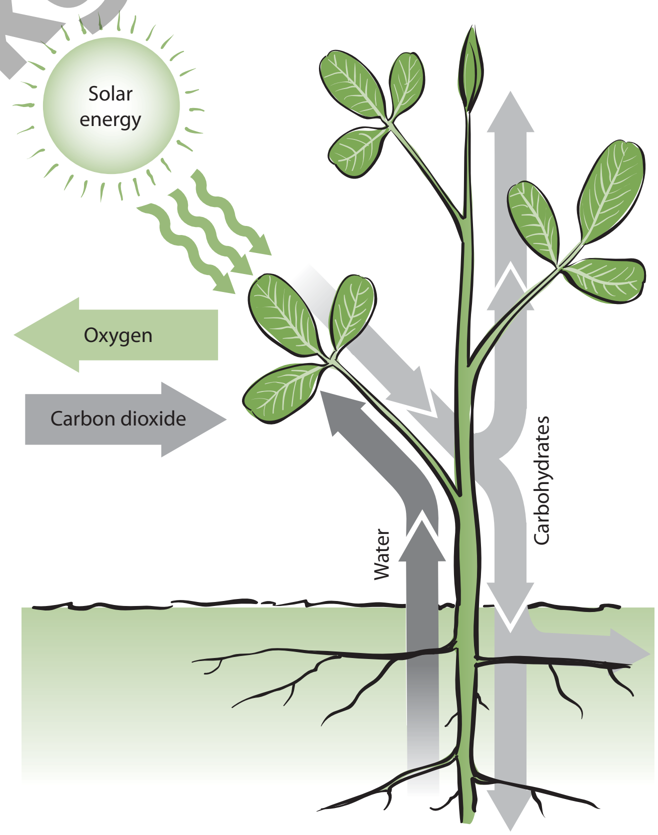


FIGURE 13.2

Plants use energy from the sun during growth to transform carbon dioxide and water to carbohydrates. Carbohydrates for alfalfa regrowth are translocated to the roots. Plants harvested at an immature stage accumulate fewer "root reserves" for subsequent regrowth.



be reduced if alfalfa is repeatedly cut before root reserves are restored. Repeatedly cutting immature alfalfa plants in attempts to obtain high-quality hay, in combination with other stresses such as water stress, scalding, pest stress, and equipment traffic, are the most common reasons for stand loss in Mediterranean and desert regions.

The Effects of Plant Maturity on Yield

Alfalfa yield per cutting increases as plants mature during a growth period and the interval between cuttings increases. Yield can double as alfalfa goes from the pre-bud to full-bloom stage. In theory, maximum yield occurs when alfalfa reaches full bloom (Fig. 13.1). However, as a result of leaf senescence and loss from lower portions of mature alfalfa plants, maximum alfalfa yield is often reached at around 50-percent bloom and may level off after this point. Most California growers harvest during early to late-bud stage, and well before the alfalfa exceeds 50-percent bloom. Stages of alfalfa growth are provided in Tables 13.1 and 13.2.

In Mediterranean and arid environments, increases in yield are mostly linear, from early vegetative to early bloom stages, with each day bringing a steady increase in the dry matter accumulation of the crop. The actual rate of yield increase varies, depending on environmental conditions (such as weather, soil fertility, soil moisture levels) as well as alfalfa variety and other management factors. In research trials conducted in the Central Valley (Yolo and Fresno Counties), yield increased from 65–221 pounds (29–100 kg) of dry matter per acre (33–112 kg/ha) per day as alfalfa matured from the vegetative pre-bud stage to full bloom (Fig. 13.4).

TABLE 13.1

Relationship between stage of maturity and crown bud development

Stage of Maturity	Crown Bud Development
Flower bud stage	50% of the crown with buds ¼ in. or less
10% bloom	60% of the crowns with regrowth ½ in.
50% bloom	90–100% of the crowns with regrowth 1 to 2 in.
Full bloom	100% of the crowns with bud regrowth in excess of 2 in.

FIGURE 13.3

Cutting at different growth stages affects the carbohydrate content of alfalfa roots.

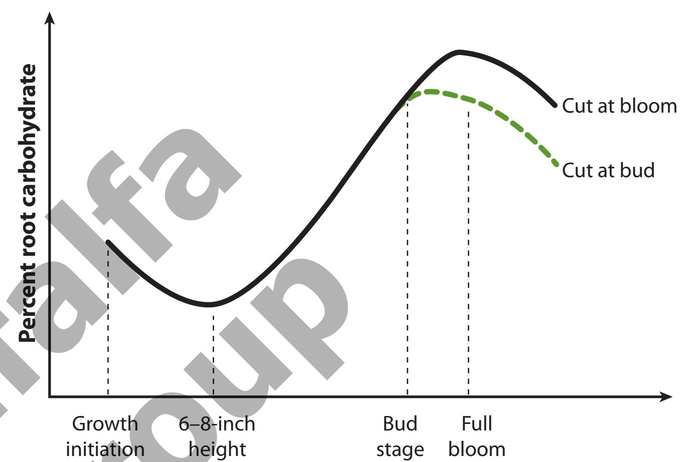


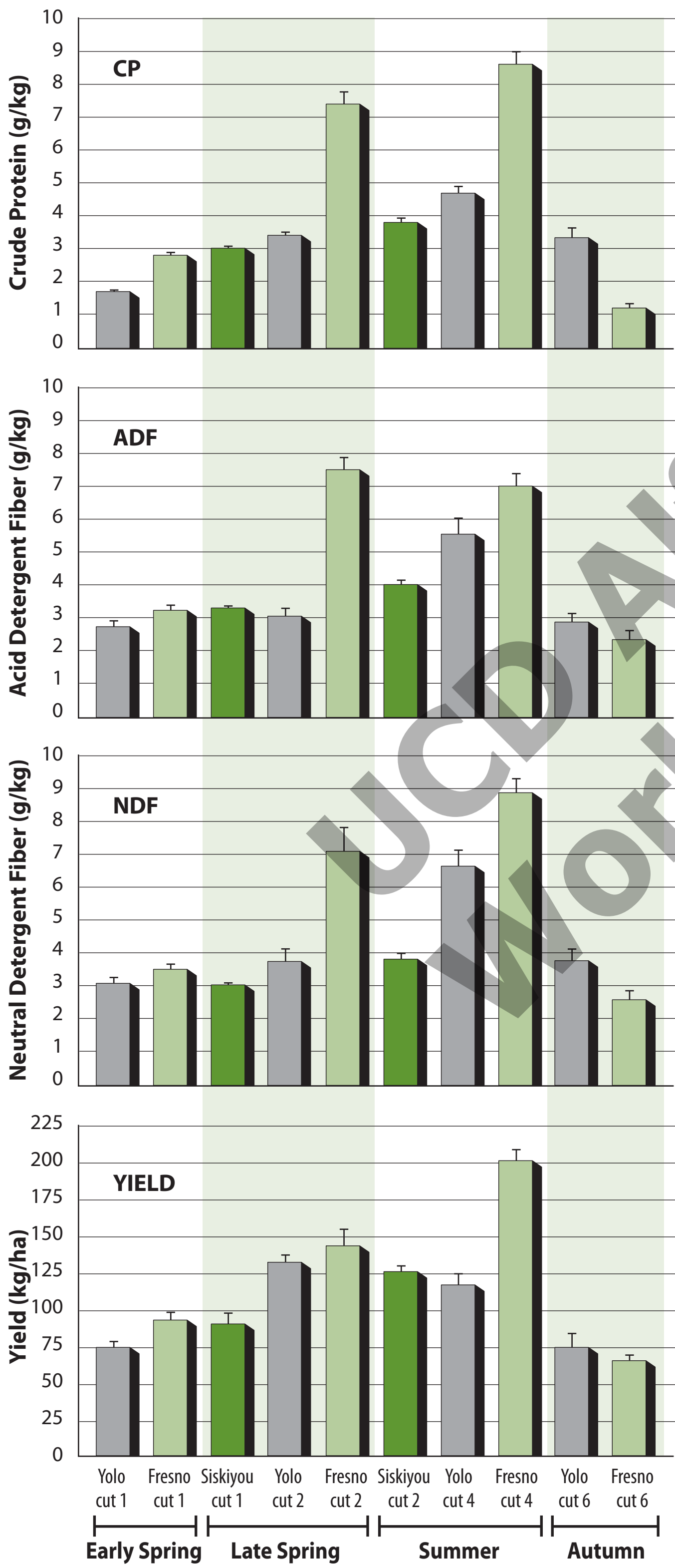
TABLE 13.2

Definition of alfalfa developmental stages for individual alfalfa stems

Stage Number	Stage	Stage Definition
0	Early vegetative	Stem length ≤ 5 inches (13 cm); no buds, flowers, or seed pods
1	Mid vegetative	Stem length 6–12 inches (15–30 cm); no buds, flowers, or seed pods
2	Late vegetative	Stem length > 12 inches (30 cm); no buds, flowers, or seed pods
3	Early bud	1–2 nodes with buds; no flowers or seed pods
4	Late bud	≥ 3 nodes with buds; no flowers or seed pods
5	Early flower	One node with one open flower; no seed pods
6	Late flower	≥ 2 nodes with open flowers, no seed pods
7	Early seed pod	1–3 nodes with green seed pods
8	Late seed pod	≥ 4 nodes with green seed pods
9	Ripe seed pod	Nodes with mostly brown mature seed pods

FIGURE 13.4

Average daily increase in yield (bottom graph), and decline in quality (increase in ADF, NDF, decrease in CP, top three graphs), as alfalfa matures from pre-bud to full bloom at Yolo County, Fresno County, and Siskiyou County, CA, during different seasons (Ackerly 2001).



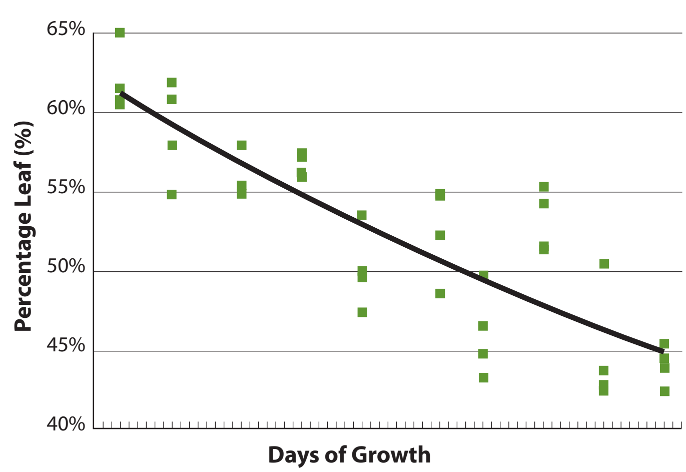
The Effects of Plant Maturity on Forage Quality

In contrast to yield, forage quality and digestibility decline dramatically with advancing alfalfa maturity (Fig. 13.1), (also see Chapter 16, "Forage Quality and Testing"). There are two primary reasons for this decline. First, as alfalfa plants grow, the proportion of stems to leaves (as a percentage of the dry matter yield) increases rapidly. During the vegetative stages, the weight of leaves may be up to 70 percent of the total yield. However, as the plant ages, the stems continue to grow, whereas the leaf biomass remains relatively constant, so the leaf percentage declines to 40–45 percent of the crop by mid bloom (Fig. 13.5). Because leaves are much higher in forage quality than stems, forage quality declines. In addition, the quality of the stem material itself declines rapidly as the plant grows and matures (Fig. 13.6). The forage quality of the leaf portion changes little with increased maturity, but the stems rapidly become much more fibrous, especially the highly indigestible lignin component.

The combined effect of declining leaf percentage and increased fiber in the stems dramatically affects forage quality as the alfalfa plant matures. These morphological changes cause reliable and powerful negative effects on forage quality during the growth period and

FIGURE 13.5

Effect of plant maturity on leaf percentage, first cutting, Davis, CA, (Ackerly 2001). Leaf percentage has a powerful effect on forage quality, and ranges from about 65% to 40% over a growth period.



understanding these changes is important for making cutting schedule decisions.

Seasonal and Environmental Effects on Cutting Schedule Decisions

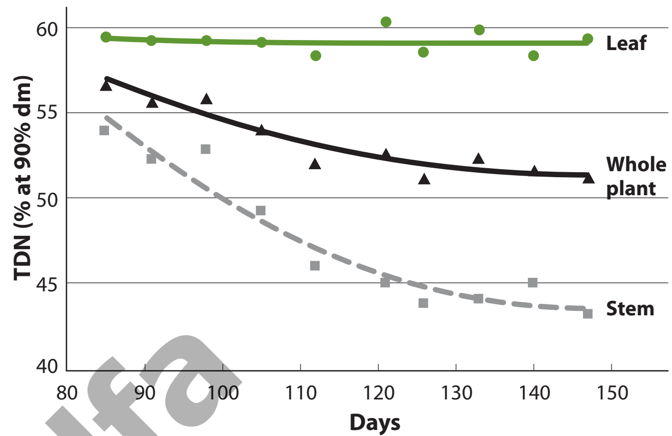
The optimum cutting strategy may be impacted by location, time of year, and even time of day. Changes in acid detergent fiber (ADF), neutral detergent fiber (NDF), and crude protein (CP) are much more rapid during summer months than during spring and fall (Fig. 13.4). In studies in the Sacramento Valley, ADF and NDF increase about 0.3 percentage points per day during spring, but about 0.6–0.7 percentage points per day during summer. Similarly, CP decreases much more rapidly during summer months, compared to spring or fall. Thus, losses in quality are much more rapid during hot summer months than during spring or fall. Consequently, a 28-day harvest schedule, for example, will result in higher quality in spring and fall versus summer.

Seasonal effects are primarily due to changes in temperature, solar radiation, and photoperiod (day length). Of these, temperature appears to exert the greatest influence. Within a season, quality declines much more rapidly at warmer locations. For example, in our studies, loss in quality was much greater in Fresno County (which has hotter days and nights) compared with Yolo County (Fig. 13.4). The final cutting of the season in all Mediterranean and desert regions typically yields less but has much higher quality than previous cuttings because the growth rate slows in response to cooler nighttime temperatures and shorter day lengths.

Alfalfa producers frequently complain about the difficulty in producing high-quality alfalfa in midsummer. Even when cut at the same growth stage, alfalfa harvested in spring and fall will usually have higher digestibility than alfalfa cut in midsummer. The decline in forage quality with advancing maturity is much slower in early spring and fall than in summer (Fig. 13.4). Poor forage quality in summer months is caused by rapid rates of fiber and

FIGURE 13.6

Effect of plant maturity on TDN content (calculated from ADF) on the stem, leaf, and whole-plant components of alfalfa, first cut, Davis, CA (Ackerly, 2001).



lignin accumulation and lower leaf-to-stem ratios.

Although obtaining high quality on every cutting during summer months may be nearly impossible, especially in the hot desert and Mediterranean regions, growers may want to consider "staggered" cuttings that allow some harvests to be high yield but low quality, and cut alternating harvests early for higher quality. This approach provides a "rest" period after a short cutting interval to give the plant more time to replenish root reserves. This concept is discussed more later in this chapter.

Time of Day Influences

There is some evidence that harvesting during afternoon periods (e.g., noon through 8 p.m.) may result in higher-energy, lower-fiber hay. In the afternoon, sugars and starches may temporarily accumulate in plant tissue due to the rapid rate of photosynthesis. At night, these compounds are respired and used by the plant, slightly increasing the fiber level. Accumulation of sugars (and other soluble components) in the cells may lower the fiber and the crude protein concentration due to dilution with cell solutes. Cell solutes (mostly sugars) contribute to the energy value of the forage and may improve palatability.

If alfalfa is cut in the afternoon, and respiration in windrows is minimal, the higher concentration of soluble carbohydrates may contribute 1 to 1.5 percent of the total digestible nutrients (TDN) of the forage. Although TDNs are higher in afternoon harvests, lower CP levels are often observed, due to dilution of the protein with soluble carbohydrates. All other factors being equal, we recommend afternoon cutting (compared to early morning), if feasible, to help "tip the balance" toward higher quality.

It is likely that the advantage of afternoon harvest would be greatest under mild, sunny conditions, not under cloudy growing conditions or excessive heat. Diurnal changes in quality may only be preserved where the forage is properly conditioned and curing conditions after cutting favor minimal respiration in the windrow.

How Many Harvests Over the Year?

The principles discussed earlier in regard to the yield–quality tradeoff hold true for the selection of a cutting schedule for the season as well. More cuttings per year do not equate to higher total production per year. In fact, the opposite can be the case. Within reason, a long cutting interval (fewer harvests) will generally result in higher total seasonal production (Table 13.3, Fig. 13.7). Cutting five to six times in the Central Valley of California at full bloom (harvest interval of 37 days) resulted in an average yield over 3 years of 11.6 tons per acre (25.9 Mg per ha) per year. In contrast, harvesting at pre-bud, every 21 days for a total of nine to ten cuttings per year, resulted in a 3-year average yield of 7.5 tons per acre (16.8 Mg per ha) per year (Table 13.3). A separate study conducted during 2002-2004 showed a clear advantage of

FIGURE 13.7

Effect of cutting schedules (Early, 23 days; Mid, 28 days; Late, 34 days) on yield of alfalfa, average 2002–2004, Davis, CA. Data averaged across 18 varieties, all cuts. The darker portions of the bar graph represent higher quality yields from each cutting schedule, averaged over 3 years.

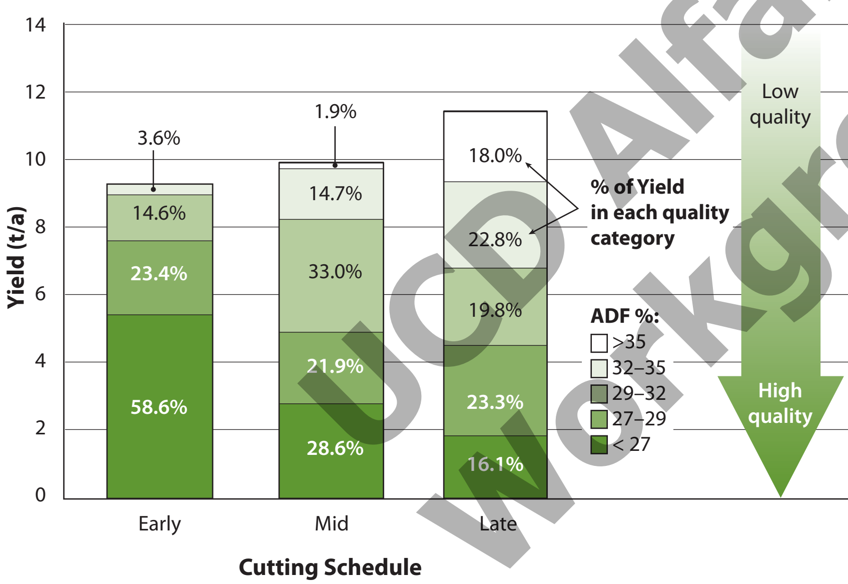


TABLE 13.3

Effects of different alfalfa cutting frequencies on 3-year average yield and quality, weeds, and stand at the end of the third year at Davis, CA (*Source:* V. Marble, 1974)

Maturity at harvest	Harvest interval (days)	Harvests per year	Yield tons/A	TDN*	Crude protein	Leaves	Weeds	Stand
Pre-bud	21	9–10	7.5	56.3	29.1	58	48	29
Mid-bud	25	8–9	8.8	54.2	25.2	56	54	38
10% bloom	29	7	9.9	52.4	21.3	53	8	45
50% bloom	33	6–7	11.4	52.0	18.0	50	0	56
100% bloom	37	5–6	11.6	50.1	16.9	47	0	50

*Percent total digestible nutrients (TDN) expressed on a 90-percent dry-matter basis calculated from modified crude fiber (MCF) late cutting schedules (typically 5-6 cuts) for yield, but a large component of these harvests were low quality (Fig. 13.7). Similarly, short cutting schedules (23 days) resulted in high quality but lower yields (Fig. 13.7).

Frequent cutting also reduces alfalfa stand life and vigor. In the Central Valley, plots harvested at 50 or 100 percent bloom (five harvests per year) had no weeds, whereas plots cut at pre-bud or mid-bud (eight to nine times per year) had approximately 50 percent weed cover after 3 years (Table 13.3). This is due to stand loss in the treatments where the alfalfa was cut more frequently.

Identifying the Best Cutting Schedule Strategy

Selection of the best cutting schedule is not an easy task, since so many factors are involved. It requires the integration of all the topics mentioned above into a season-long harvest management plan, which includes market considerations as well as agronomic factors. The timing of an individual cutting should not be considered alone, but in relation to its effect on the entire production season, with consideration of stand life and economics over time. Several factors are important: the quality of the hay desired, time of year, weather conditions, desired stand life, and practical considerations, such as the irrigation schedule, harvests costs, whether the grower uses a custom harvester, and market conditions.

The growth stage at which alfalfa is cut should reflect the intended use of the hay. Alfalfa intended for use as a feed for beef cows or for recreational horses can be of much lower quality than that sold to dairies for high-producing milking cows. Alfalfa hay intended for the dairy market must be cut early (late-bud stage at the latest) for the necessary quality to be achieved, at least for most dairy buyers. Conversely, hay intended for beef cattle or horses can be cut later, at 10- to 30-percent bloom, to maximize yields with acceptable quality for these classes of livestock. See Chapter 17 which cover utilization of alfalfa by various classes of livestock.

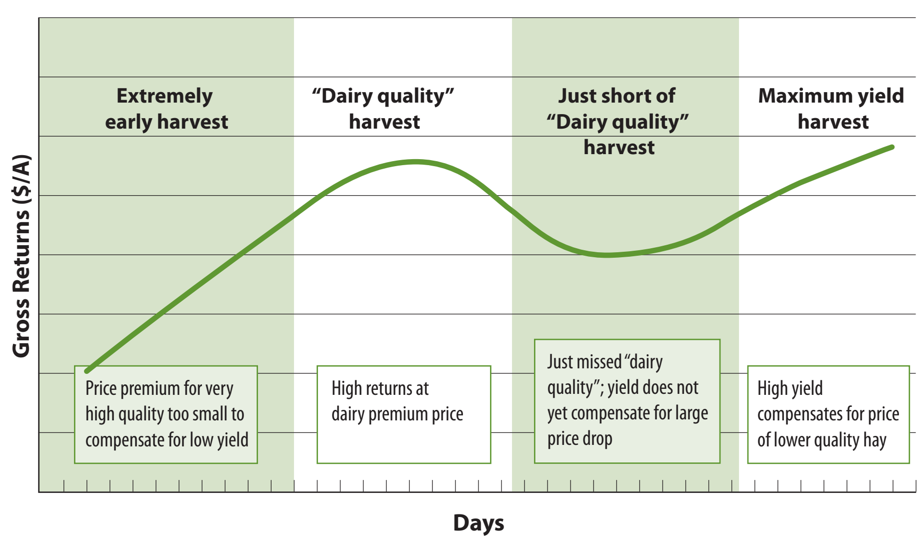
Weather conditions alter the growth rate and forage quality of alfalfa. Therefore, a cutting schedule should account for changes in weather. In addition, rain or extremely poor curing conditions can reduce the forage quality of alfalfa hay after harvest. If preserving alfalfa as hay, it is best to avoid cutting when very poor curing conditions or rain are anticipated.

Economic Considerations

Deciding when to harvest is largely an economic decision. Given the existence of the yield–quality tradeoff, the decision is not easy. Early harvest results in low yield but high forage quality and price, whereas delayed harvest results in increased yield but forage quality and price decline. The optimal time to cut alfalfa depends on the cutting schedule that generates the highest revenue (Fig. 13.8).

FIGURE 13.8

Gross returns as affected by alfalfa cutting schedules. Although there are several possible outcomes, a typical curve shows that early growth produces high quality but insufficient yields, followed by an optimum combination of yield and quality, and subsequently a decline in gross returns due to loss in quality. Under some market conditions, very high yields at long cutting schedules may result in a recovery of gross returns.



Consider the difference in price between premium dairy quality and less-digestible hay (typically hay used for beef cows or nonlactating dairy cows). This price difference varies significantly over the season and from year to year. The average differences due to quality have been approximately $7.00 per unit ADF in California markets over eight seasons, but range from $4.00 to $9.00, depending on year and location. This averages about $45.00 from top to bottom market categories. To determine the most profitable approach, take into account the rate of change in yield and quality for that season and the current price differential between the different quality market classes for alfalfa hay.

Pest management decisions may also impact cutting schedules. The decision to harvest early to control an insect pest without resorting to spraying is an option for weevil control in spring and worm control in summer. Additionally, allowing longer growth periods at least a few times during the year may enable an alfalfa crop to compete more vigorously with weeds.

Common Cutting Schedule Strategies

Calendar Dates

Alfalfa fields are frequently harvested on a calendar basis, using a predetermined fixed interval and fixed number of cuttings per season. The advantage of this method is that it facilitates planning. It allows advance scheduling of irrigation, cutting of other fields, and bale pickup. Cutting fields on a calendar basis is common when a custom harvester is employed to harvest fields. Custom harvesters often harvest fields on a predetermined interval, typically every 26–28 days, to schedule the harvest of other clients' fields.

The problem with harvesting alfalfa on a calendar basis is that it does not account for variable weather conditions, different rates of growth due to dormancy of the variety, temperature, season, or differences in growth between fields. For example, 28-day alfalfa during a hot August period will likely be very different than 28-day alfalfa during a cool May. Weather in most Mediterranean and arid climates is relatively constant during the summer months but can still fluctuate enough even during the summer to affect yield and quality at a constant cutting interval. Spring and fall weather is more variable than summer, and there should be enough flexibility in the cutting schedule to allow for adjusting to weather changes. The dormancy of a variety also influences its rate of development (Chapter 5, "Choosing an Alfalfa Variety"). In general, a less dormant variety will be more mature on a given date than a more dormant variety. Scheduling harvests using the calendar fails to account for the stage of growth of the crop at each harvest.

Harvesting by Growth Stage

Another method of scheduling alfalfa harvests uses the growth stage of alfalfa to indicate the appropriate time to cut and thus the number of cuttings per season. The grower selects a specific alfalfa growth stage (such as pre-bud, bud, 10-percent bloom) at which harvest will begin. This method takes into account the effects of environmental and varietal differences and results in more consistent, predictable forage yield and quality than when harvesting on a calendar basis. Generally, the alfalfa growth stage at harvest is based on the appearance of bud or bloom; however, regrowth from crown buds is also used to indicate the proper time to cut (Tables 13.1 and 13.2).

Harvesting by growth stage results in more consistent, predictable forage yield and quality than when harvesting on a calendar basis.

The primary drawback to cutting based on stage of development rather than a calendar basis is that it is more management intensive and requires the ability to make labor and schedule adjustments. Additionally, the "stage" of development often does not always correspond to known values of quality and yield across environments. For example, a "full-bloom" alfalfa in the deserts of California may be higher in quality than a full-bloom alfalfa in a cooler environment. That is because flowering under desert conditions often occurs very early (sometimes within 10 days) and actually produces a higher-quality plant (lower stem percentage) than a full-bloom alfalfa growing in a cooler environment (higher stem percentage).

Growth Models

Growing-degree day models have been developed for some areas of the country to predict alfalfa growth and quality. These models have not been consistently accurate across cuttings, years, or environments. The problem may be that although temperature is a major factor, it is not the only factor affecting alfalfa growth and development. Most growing-degree day models developed for the Midwest for predicting forage quality are limited to the first cutting. The usefulness of this approach for Mediterranean regions is questionable, as winters are mild and the alfalfa often never goes truly dormant, making it difficult to apply a growing-degree day model.

Numerical Staging

Methods have been developed to quantitatively assess the maturity of alfalfa. One such method is a 10 stage numerical system (Table 13.2) in which alfalfa growth stages are described based on stem length or the presence of reproductive structures (see Chapter 3, "Alfalfa Growth and Development"). Alfalfa stems are visually evaluated and categorized. Only the first seven stages are used for hay production. These numerical categories can then be used to predict the forage quality of a standing alfalfa crop by determining a weighted average for a sample. Either the weight of the stems (mean stage by weight [MSW]) or the number of stems (mean stage by count [MSC]) that falls into each category is multiplied by the number corresponding to that stage. This number is then divided by the total weight or count for the MSW or MSC method, respectively (see Chapter 3, "Alfalfa Growth and Development" for examples of these calculations). Correlations between the mean stage value and the forage quality are used as a harvest decision tool.

PEAQ

A variation of this system, which is easier to use, was developed to predict the forage quality of alfalfa. The system is called Predictive Equations for Alfalfa Quality (PEAQ). This method uses the numeric growth stages, as determined by the scoring system described in Chapter 3. The PEAQ method involves evaluating only the most mature stem in a sample and the height of the single tallest stem to predict the forage quality of a standing alfalfa crop. PEAQ has worked well to predict forage quality in short-season production regions where dormant alfalfa varieties are produced. This technique may not be as accurate for Mediterranean regions where semidormant and nondormant varieties are produced and there is not as much variation in plant height over the season as there is in short-growing-season areas.

PEAQ has worked well to predict forage quality in short-season production regions where dormant alfalfa varieties are produced.

Staggered Cutting Schedules

To achieve dairy-quality hay in midsummer, alfalfa must be cut at an extremely immature growth stage. However, this may not be worthwhile. The yield sacrifice associated with such early cutting is significant. Additionally, continued frequent harvests are harmful to root reserves, regrowth potential, and ultimately stand life. A "rest period" in midsummer would allow more time for the alfalfa to store root reserves. Therefore, it may be best to delay harvest and produce beef or horse hay in midsummer, targeting early spring and fall harvests for the dairy market. "Staggering" longer cutting intervals with shorter intervals may be beneficial in a single field, but practical considerations (scheduling of water, labor, machines) may limit this approach.

Although scheduling harvests by the calendar is most convenient, this strategy may result in harvests that "just miss" high quality, yet don't maximize yield (Fig. 13.8). The most common cutting schedule in the Low Desert and Mediterranean regions of California is 28 days, and many growers harvest as often as 21–24 days to achieve high quality. Even with frequent cutting, growers often fail to achieve high quality due to high summer temperatures (see Chapter 16, "Forage Quality and Testing"). Repeatedly harvesting at such short intervals in an attempt to achieve high quality may cause severe stand loss, weed intrusion, and low yields, and is not recommended.

Although scheduling harvests by the calendar is most convenient, this strategy may result in harvests that "just miss" high quality, yet don't maximize yield.

A more complex strategy that involves staggering short and long cutting intervals may be beneficial to account for the need for high-quality hay while maintaining high yield and increased stand life. This approach entails planning a "short–long" cutting cycle, or a "cut for yield then cut for quality" strategy. This may be accomplished by changing the order of fields harvested from the first to the last field, so that the order is different in the second cutting compared with the first, and different in the third compared with the second. This allows a "recovery period" after a short cutting cycle during which the plant has an opportunity to recover its root reserves before subsequent cuttings. Growers may schedule an additional irrigation during this period to maximize yield and plant recovery.

This approach incorporates the agronomic advantages of long cutting cycles, while still producing high-quality forage to satisfy the quality demands of dairy markets at other harvests. From a marketing perspective, this strategy allows a continual stream of both high- and medium-quality harvests for different market uses. Compared with continual early harvests, this strategy should improve alfalfa vigor and stand longevity and help prevent weed invasion.

Although this approach introduces greater complexity and requires a higher level of management, a "staggered" strategy which allows at least one to three "recovery" periods during the season is likely to contribute to long-term profitability.

Cutting Height

Occasionally, questions arise regarding the appropriate cutting height for alfalfa. The bottom of the stem is the least nutritious part of the alfalfa plant. Perhaps raising the cutting height could improve the nutritional quality of the alfalfa. Studies from the central and northern United States have shown that average annual yields of dry matter, protein, and digestible dry matter decrease as cutting height increases from 3 to 9 inches (8 to 23 cm). Wisconsin data shows that cutting above 2 inches (5 cm) results in a yield reduction of 0.5 tons per acre per year (1.12 Mg per ha^{-1}) per inch of additional cutting height. Raising the cutting height did increase forage quality, but it resulted in a significant decrease in yield. Therefore, leaving a stubble height of no more than 2–4 inches (5–10 cm) is recommended when cutting alfalfa.

Fall and Winter Harvest Management

The timing of the last harvest in the fall is an important consideration. Weather conditions may dictate when to make the last hay harvest. However, greenchop, silage, or grazing with sheep may be feasible later in the season when a hay harvest is not possible. Weather conditions are not the only factors to consider. Keep in mind the effect of fall harvest management on stand life and vigor. The timing of the last harvest in fall is very important in cold areas of the country where winter conditions are harsher than in Mediterranean regions. The importance of fall harvest management is not as obvious in Mediterranean and arid climates where nondormant alfalfa varieties are produced.

Late fall or winter harvesting can affect yield the following year, as well as stand life, weediness, and the degree of damage by the Egyptian alfalfa weevil and aphids. Just as too frequent a cutting interval during the normal production season can excessively deplete root reserves, so can harvesting too many times during late fall or winter. Research in the Central Valley of California indicated that it is possible to harvest alfalfa once in November or December without harming yield the next season, seriously damaging stand and vigor, or increasing weed contamination. However, additional harvests before the following spring can have detrimental long-term effects on alfalfa.

Research in the Imperial Valley showed no reduction in yield, vigor, or stand density with one or two late fall to winter harvests, provided there was a rest period of at least 45 days between harvests made from December through mid-February. Winter grazing of alfalfa in these desert environments may be advantageous, since haymaking is difficult. A sufficient rest period is also advised before grazing, because grazing, like cutting, can excessively deplete root reserves. Caution should be used to avoid animal traffic damage to crowns if the soil is wet.

Additional Reading

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