



Intensive Early Stocking

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practices, such as prescribed burning. Not only do IES and prescribed burning complement each other, but a rotation of the combination will ensure that each pasture is burned and rested regularly.

Producers should not hesitate to utilize the forage remaining after late-season deferment, once the first hard freeze has occurred and the plants are dormant. This forage can be grazed over winter, saved for cattle arriving in spring, or used as fuel for a prescribed burn. When plants are dormant, they can be grazed without reducing carbohydrate reserves that will be used to initiate growth the following spring.

Standing forage serves as nesting cover for birds such as greater prairie chicken, bobwhite quail, songbirds and provides protective cover for other wildlife. Consideration should be given to leaving this cover if wildlife management is an objective of the ranching operation. Prescribed fire can improve brood rearing habitat for birds by reducing mulch, providing succulent vegetation, promoting large insect populations, and reducing external parasites. Late spring burning on a large scale, however, can have negative impacts on ground-nesting birds if spring nesting is interrupted or insufficient cover is left. As with most management practices, there are trade-offs. All of these concerns should be addressed in a management plan for the entire ranch before IES is used.

Summary

Intensive-early stocking is a successful, proven grazing system, developed to increase beef production. In addition to the effects on livestock, IES has been shown to promote desirable forage species for cattle and expand opportunities for other rangeland improvements. Integrating IES with other management practices can also increase marketing options. Increased beef production and reduced operating costs allow greater short-term profit, while improved vigor and production of desirable forage, as well as additional marketing options, support long-term stability for the operation.

For additional information, see the following Extension Publications:

- PSS-2871 Stocking Rate: The Key to Successful Livestock Production
- NREM-2870 Drought Management Strategies
- NREM-2869 Management Strategies for Rangeland and Introduced Pasture
- PSS-2867 Difference Between Range and Introduced Pasture Management
- E-904 Habitat Appraisal for Bobwhite Quail
- E-927 Using Prescribed Fire in Oklahoma
- E-969 Ecology and Management of the Greater Prairie-Chicken
- E-970 Ecology and Management of the Lesser Prairie-Chicken

Many Oklahoma livestock producers are looking for ways to increase beef production, improve their rangeland for cattle grazing, diversify their operation and expand cattle marketing opportunities. Intensive-early stocking (IES) is one form of grazing management that helps producers achieve many of these goals. IES was conceived in eastern Colorado but has been widely adopted in Kansas tallgrass prairie to improve the efficiency of forage harvest by stocker cattle. The system has been used there for many years, but with the exception of ranchers in northeastern Oklahoma, few in Oklahoma have used IES because most are cow/calf operations.

IES involves doubling the number of cattle required to stock moderately season-long (from May through September), and allows grazing only during the first half of the growing season (from May through mid July). In tallgrass prairie, two-thirds of cattle gains generally occur by mid July, and more than two-thirds of the forage is produced by that time. IES was designed to take advantage of high forage production and quality during the first half of the growing season while avoiding the late-summer slump.

The deferment of grazing during the last half of the growing season benefits native warm-season grasses by allowing them to build root reserves before entering dormancy. This rest also can provide opportunities for other vegetation management practices. Because IES cattle are removed from the rangeland at an unconventional time, producers have more marketing options. The cattle can be sold as light cattle, moved to another forage type, or moved to a feedlot.

Stocking Rate vs Stocking Density

While stocking rate is often discussed in terms of acres per head, this is actually stocking density. Stocking rate includes animal units, pasture size, and length of grazing period. Stocking density has no reference to time. The information provided by each of these terms is very different. Stocking rate accounts for variation in forage use between animals of different size and the amount of exposure those animals have to the forage. Similar stocking densities can produce various stocking rates and vice versa. This difference is important in explaining the effects of IES. While the stocking density for IES is twice that of season-long stocking (SLS), the stocking rate is unchanged because the grazing period is reduced by half (Table 1).



Stocking rate may be increased with grazing systems that use high stocking densities for short periods of time. This is only the case when grazing distribution is improved. Stocking at high densities forces cattle to be less selective, so they may utilize plants and areas that were previously avoided. If grazing is already uniform, an intensive system will not support increased stocking rates without some detriment to the rangeland. Stocking rate is more important than grazing system.

Forage Production

Vegetation and stocker cattle response to IES are best described by comparison with effects of other grazing practices. Season-long stocking has been selected for such comparison because continuous grazing systems are common in Oklahoma and SLS is the form of continuous grazing most comparable to IES.

Intensive-early stocking with double the season-long cattle density (2X) increases the amount of herbage remaining at the end of the growing season. Even in cases where the amount of standing herbage is the same after SLS, grazing is more evenly distributed across the pasture. If prescribed burning is part of the management plan, the continuity of fuels that IES provides can improve the effectiveness of fire for brush control or other management objectives. The fact that

Table 1. Comparison between season-long stocking (SLS) and intensive-early stocking (IES) for stocker cattle on native grass.

	SLS	IES
Land Area (acres)	200	200
Grazing Season	5/1 - 9/30	5/1 - 7/15
Grazing Days	150	75
Number of Steers	50	100
Stocking Density (acres/steer)	4	2
Stocking Rate (AUM/acre) ¹	0.88	0.88

¹ Animal unit month equals 780 pounds of air-dried forage.

end-of-season standing crop has been shown to be greater with IES suggests either foraging efficiency increases, forage production increases, or forage consumption decreases.

Broadleaf plants (forbs) have been reduced as much as 50 percent in mid-July with IES. Forb reductions occur because a number of forbs are readily consumed by cattle during spring and early summer, and forbs are usually less resistant to grazing than grasses. The late-season deferment, however, benefits many forbs. By the end of the growing season, forb standing crop may be equal to that in pastures stocked season-long.

While additional forage may be available following IES, stocking rates cannot be increased without some loss of preferred cattle forages or increase of undesirable plants. IES with 2.5 and three times the moderate season-long cattle density increases production of cool-season annuals and shortgrasses. Forb standing crop is also greater nearly 50 percent of the time with higher stocking rates. Total herbage standing crop at the end of the growing season is the same for 2.5 and 3X densities, but both are lower than the 2X density. The loss of herbage is a result of declines in high-producing grasses such as Indiangrass in tallgrass prairie and western wheatgrass in mixed prairie.

Prescribed Burning

Prescribed burning in spring is not necessary for IES, but the two are mutually beneficial for cattle production. The uniformity of herbaceous fuels that occurs with IES allows fire to carry continuously across a pasture, providing more intense fire and better brush control. The advantages of using prescribed burning include brush and forb control, enhanced forage quality, more uniform grazing distribution, and increased weight gains for livestock.

Livestock Performance

The advantages of IES for beef production are increased daily weight gains and more gain per acre. Grazing season gains for individual animals are reduced with IES since the season is half as long, but improved daily gains and higher stocking density allow for greater total beef production. Be-

cause IES is designed for rapid gains, the system is best suited to large-framed stockers with potential for compensatory gain. Spring burning is recommended for further improvement in livestock performance. The combination of IES with spring burning appears to promote more beef production than explained by the sum of gains from each practice used alone (Table 2). Weight gains of summer stocker cattle are commonly 10 to 15 percent greater after prescribed burning.

Stocking density has little influence on livestock performance under IES in tallgrass prairie (Table 3). By mid-July, weight gain for individual steers stocked at a moderate season-long rate often are the same as that of cattle stocked at two, 2.5, and three times the SLS density. Differences in cattle gains between IES and SLS occur after mid-season when forage growth and quality decline. This change between each half of the growing season is most pronounced in tallgrass prairie where two-thirds of the gains occur early. Only about 55 percent of total weight is gained during the first half of

Table 2. Percent change in stocker cattle performance from four studies using different combinations of intensive-early stocking (IES), fire, and season-long stocking (SLS).

	IES vs SLS	SLS+Fire vs SLS	IES+Fire vs SLS+Fire	IES+Fire vs SLS
	(%)			
Gain/Acre	19	26	37	74
Average Daily Gain	9	26	40	78
Gain/Steer	-41	26	-31	-12

Table 3. Comparison of intensive early stocking rates on stocker cattle performance in tallgrass and mixed prairies.

Stocking Density	Average Daily Gain	Gain / Acre	Gain / Steer
	(lb)		
Tallgrass Prairie			
2X SLS ¹	2.2	93	167
3X SLS ²	2.2	138	165
Mixed Prairie			
2X SLS ¹	1.5	64	110
3X SLS ²	1.2	73	89

¹ Two times the number of animals for one-half the amount of time. From the time that native grass begins to grow until July 15 (75 days maximum).

² Three times the number of animals for one-half the amount of time. From the time that native grass begins to grow until July 15 (75 days maximum).

the season in mixed prairie because shortgrasses and mid-grasses maintain nutritive value much longer than tallgrasses. Substantial increases in production per acre can be obtained in mixed prairie with 3X-IES and marginal increases may be achieved with 2X-IES over SLS, but higher stocking density is not sustainable over time. Total beef production increases as IES densities are raised in tallgrass prairie, but shifts in species composition toward forbs and cool-season grasses may reduce long-term profitability of higher stocking rates.

Feeding and Feedlot Performance

Cattle stocked season-long usually require protein supplementation during the latter half of the season. Because IES cattle are offered higher quality forage, the need for protein supplementation is reduced or eliminated. Feeding high concentrate rations during the backgrounding phase can be beneficial, depending on the arrangements of the operation. Cattle limit-fed concentrate feeds during the winter will weigh more at the beginning and end of the grazing period and usually gain better for the first month in the feedlot. Gains, however, are reduced in the grazing phase by about 1/3 of a pound for each additional pound gained in winter. If cattle are being purchased or leased on gain after the backgrounding phase, selecting cattle that have not previously been fed allows for greater summer gains. In the feedlot, IES cattle consume about 16 percent less feed than SLS cattle. Also, IES cattle are more efficient at converting feed, requiring 12 to 13 percent less feed per pound of gain. Even when IES cattle enter the feedlot weighing less than SLS cattle, daily gains are equal and carcass traits at slaughter are similar.

Economics

IES can be implemented into an existing operation without additional long-term investment. Unlike rotational grazing systems (including short duration grazing), IES does not require additional fencing or equipment. However, running twice the number of cattle may require larger handling facilities.

Availability of capital is an important factor in determining the feasibility of using IES because adjustments in credit may be necessary to acquire additional cattle. Since cattle may be held only half as long as cattle stocked season-long, substantial reductions in per-head interest payment can be realized. Additional benefits result from the economies of size, such as reduced labor, hauling, marketing, and fixed costs per head. Annual operating costs also may be reduced with decreased feed, labor, machinery use, and capital investment.

IES provides additional marketing options because cattle can be moved to another pasture, sold as light cattle, or sent to the feedlot at the end of the grazing period. This allows the producer to reduce risks of market variability by marketing cattle at different times of the year. Selling cattle in July gives producers the premium prices offered for light cattle. The shortened grazing period also offers opportunities for rangeland improvements that require deferment, without reducing the ranch's total livestock inventory. The higher cattle densities may increase the economic feasibility of some vegetation management practices.

Economic analysis shows IES and prescribed fire may increase net return per acre by 114 percent over SLS (Table 4). IES provides greater returns or lower losses than SLS in eight of the 10 years evaluated thereby reducing risk. IES is

economical if 60 percent of the season-long gains regularly occur in the first half of the season. This figure normally is exceeded in tallgrass prairie. Spring burning increases returns for both grazing systems, but the improvement is much greater with IES because the enhanced gains that accompany spring burning occur early in the season. Also, IES allows fuel to accumulate thus improving the conditions for prescribed fire without deferment of grazing.

Working IES into the Operation

The greatest number of marketing and management options occur when IES is incorporated with other management practices. More stability in income is obtained as the correlation between grazing practices decreases. Coupling IES with cow/calf production, season-long stocking, or leasing, for example, offers different products or marketing periods and can help stabilize income. Committing an entire operation to IES can maximize profit, but this may also maximize the potential for financial loss. If a portion of the grazing land is moderately stocked season-long or year-long, economic disasters, such as severe drought, can be avoided by shifting IES cattle to other pastures. In general, stocker cattle add flexibility to a primarily cow/calf operation.

If two or more pastures are available, IES can be rotated among pastures each year. Such a system allows all pastures to receive the late-season deferment over time and facilitates the implementation of other vegetation management

Table 4. Ten-year estimated net returns from season-long and intensive-early stocking with and without spring burning.

Year	No Burning		Spring Burning	
	SLS	IES	SLS	IES
	(\$/acre) ¹			
1976	-8.59	-5.81	-8.13	-0.34
1977	-0.79	2.14	-0.24	7.44
1978	27.68	40.02	29.66	48.90
1979	9.71	3.20	12.42	14.36
1980	18.70	24.36	20.62	33.18
1981	5.53	-5.18	6.66	0.95
1982	8.93	13.50	9.84	19.58
1983	-6.00	-4.16	-5.58	1.06
1984	3.44	4.31	4.11	9.72
1985	-7.21	-6.29	-6.85	-1.22
Average	5.14	6.61	6.25	13.36

¹ All figures are reported as real 1985 dollars.