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

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

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

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).

<table>
<thead>
<tr>
<th></th>
<th>IES vs SLS</th>
<th>SLS vs SLS+Fire</th>
<th>IES+Fire vs SLS+Fire</th>
<th>IES+Fire vs SLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain/Acre</td>
<td>19</td>
<td>26</td>
<td>37</td>
<td>74</td>
</tr>
<tr>
<td>Average Daily Gain</td>
<td>9</td>
<td>26</td>
<td>40</td>
<td>78</td>
</tr>
<tr>
<td>Gain/Steer</td>
<td>-41</td>
<td>26</td>
<td>-31</td>
<td>-12</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Stocking Density</th>
<th>Average Daily Gain</th>
<th>Gain / Acre</th>
<th>Gain / Steer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tallgrass Prairie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2X SLS¹</td>
<td>2.2</td>
<td>93</td>
<td>167</td>
</tr>
<tr>
<td>3X SLS²</td>
<td>2.2</td>
<td>138</td>
<td>165</td>
</tr>
<tr>
<td>Mixed Prairie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2X SLS¹</td>
<td>1.5</td>
<td>64</td>
<td>110</td>
</tr>
<tr>
<td>3X SLS²</td>
<td>1.2</td>
<td>73</td>
<td>89</td>
</tr>
</tbody>
</table>

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 tallgrass.  
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 supple-
mentation 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 background-
ning 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 sys-
tems (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, substan-
tial 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 range-
land improvements that require deferment, without reducing the 
range'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 op-
tions occur when IES is incorporated with other management 
practices. More stability in income is obtained as the corre-
lation 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 ro-
tated 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.

<table>
<thead>
<tr>
<th>Year</th>
<th>No Burning SLS</th>
<th>IES</th>
<th>Spring Burning SLS</th>
<th>IES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>-8.59</td>
<td>-5.81</td>
<td>-8.13</td>
<td>-0.34</td>
</tr>
<tr>
<td>1977</td>
<td>-0.79</td>
<td>2.14</td>
<td>-0.24</td>
<td>7.44</td>
</tr>
<tr>
<td>1978</td>
<td>27.68</td>
<td>40.02</td>
<td>29.66</td>
<td>48.90</td>
</tr>
<tr>
<td>1980</td>
<td>18.70</td>
<td>24.36</td>
<td>20.62</td>
<td>33.18</td>
</tr>
<tr>
<td>1981</td>
<td>5.53</td>
<td>-5.18</td>
<td>6.66</td>
<td>0.95</td>
</tr>
<tr>
<td>1982</td>
<td>8.93</td>
<td>13.50</td>
<td>9.84</td>
<td>19.58</td>
</tr>
<tr>
<td>1983</td>
<td>-6.00</td>
<td>-4.16</td>
<td>-5.58</td>
<td>1.06</td>
</tr>
<tr>
<td>1984</td>
<td>3.44</td>
<td>4.31</td>
<td>4.11</td>
<td>9.72</td>
</tr>
<tr>
<td>1985</td>
<td>-7.21</td>
<td>-6.29</td>
<td>-6.85</td>
<td>-1.22</td>
</tr>
<tr>
<td>Average</td>
<td>5.14</td>
<td>6.61</td>
<td>6.25</td>
<td>13.36</td>
</tr>
</tbody>
</table>

1 All figures are reported as real 1985 dollars.
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