***EFFECTIVE IMMEDIATELY***
Cornell Cooperative Extension has new phone numbers!

The front desk number will remain 607-664-2300

**Ag Staff direct numbers**
Kerri Bartlett: 607-583-3170  
Stephanie Mehlenbacher: 607-583-3240

**4-H Staff**
Jenny Groen: 607-583-3245  
Kim Randall: 607-583-3185

**Executive Director**
Tom Tomsa: 607-583-3477

**Office Manager**
Robert Shirley: 607-583-3239

*Our email addresses and mailing address will remain the same*

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How Does Corn Planting Depth Affect Stand Establishment?
Bill Cox, Section of Crop and Soil Sciences, Cornell University

Growers should check corn seeding depths when they enter fields with different soil types or tillage practices.

Most agronomists agree that a ~2.0 inch planting depth is usually optimum for corn establishment in northern latitudes that receive ample rainfall during the spring. A shallower planting depth, especially less than 1.5 inches, may lead to early-season root lodging associated with shallow nodal root development or corn injury from pre-emergence herbicides. In addition, a planting depth of less than 1.5 inches or less when soil conditions are dry could result in drying out of the seed, thereby reducing emergence or delaying emergence until precipitation alleviates the dry soil conditions. Planting deeper than 2.0 inches may delay emergence, especially when planting under cool conditions in April or early May. Also, planting deeper than 2.0 inches may reduce emergence because of crusting problems, especially on heavier clay soils, or pest problems, associated with the delayed emergence.

Optimum corn seeding depths depends greatly on soil conditions as well as climatic conditions before and after planting.

We conducted a hybrid x planting date x seeding depth study at the Aurora Research Farm in 2013 and 2014. We planted two corn hybrids on five dates from early April through late May at seeding depths of 1.0, 1.5, 2.0, 2.5, and 3.0 inches. In addition, we conducted field-scale studies with four corn growers who planted corn at four seeding depths (1.0, 1.5, 2.0, and 2.5 inches). We will share with you the early plant populations taken at the 4th leaf stage (V4), about 3 to 7 weeks after planting (depending upon planting date), in each study. We will eventually run regression analyses on the data but in this news article we will just observe trends in the data, based on an ANOVA analyses.

Table 1. Days to emergence, averaged across two corn hybrids, planted on five dates and at five depths at the Aurora Research Farm in Cayuga Co. in 2013 and 2014.

<table>
<thead>
<tr>
<th>Inches</th>
<th>4/10</th>
<th>4/20</th>
<th>5/6</th>
<th>5/19</th>
<th>5/30</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>26.25</td>
<td>14.25</td>
<td>12.5</td>
<td>9.25</td>
<td>9</td>
</tr>
<tr>
<td>1.5</td>
<td>27.9</td>
<td>15.9</td>
<td>11.9</td>
<td>9</td>
<td>8.75</td>
</tr>
<tr>
<td>2.0</td>
<td>28.9</td>
<td>16.9</td>
<td>10.25</td>
<td>8</td>
<td>8.75</td>
</tr>
<tr>
<td>2.5</td>
<td>29</td>
<td>16</td>
<td>10.25</td>
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<td>3.0</td>
<td>30.25</td>
<td>16.75</td>
<td>11.25</td>
<td>8</td>
<td>8.25</td>
</tr>
</tbody>
</table>

Planing depth x planting date interaction was observed for days to emergence as well as plant populations at the V4 stage for both years in the small plot study at Aurora (Tables 1 and 2). The deeper planting depths, especially the 3.0 planting depth, required 2 to 4 additional days for emergence on the April planting dates in 2013 and 1.25 to 2.25 additional days in 2014. The 1.0 inch depth however, required an additional 1 to 1.75 days for emergence for the May planting dates in 2013 and an additional 0.75 days for the late May planting date in 2014. Obviously, cool conditions delayed emergence at the 3.0 inch
depth for the April planting dates and dry soil conditions probably delayed emergence at the 1.0 inch planting depth for May planting dates in 2013 and the late May planting date in 2014.

Table 2. Corn plant populations at the 4th leaf stage (V4), averaged across two corn hybrids, planted on five dates at five depths at a seeding rate of 31,800 kernels/acre at the Aurora Research Farm in Cayuga Co. in 2013 and 2014.

<table>
<thead>
<tr>
<th>Inches</th>
<th>4/10</th>
<th>4/20</th>
<th>5/6</th>
<th>5/19</th>
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<td>28,000</td>
<td>29,000</td>
<td>24,500</td>
</tr>
<tr>
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<td>28,000</td>
<td>27,500</td>
<td>28,000</td>
<td>29,000</td>
</tr>
<tr>
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<td>28,500</td>
<td>28,500</td>
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<td>29,000</td>
</tr>
<tr>
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<td>28,500</td>
<td>27,500</td>
<td>28,000</td>
</tr>
<tr>
<td>3.0</td>
<td>21,500</td>
<td>27,500</td>
<td>28,500</td>
<td>26,500</td>
<td>27,000</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>26,500</td>
<td>28,335</td>
<td>28,500</td>
<td>25,000</td>
<td>27,625</td>
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<td>27,000</td>
<td>27,750</td>
<td>24,350</td>
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<td>28,200</td>
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<td>27,685</td>
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</table>

+ Bold numbers indicate the highest values that are greater than the lowest value(s) in the same column (planting depth) but cannot be separated out themselves.

Delayed emergence at the 2.0, 2.5 and 3.0 inch depths affected plant populations on the early April planting date in 2013 (Table 2). Compared with the 1.0 and 1.5 inch depths, the 2.0 and 2.5 inch depths had 2500 fewer plants/acre and the 3.0 inch planting depth had 6500 fewer plants/acre. Plant populations among seeding depths, however, did not differ for most other planting dates in both years, except for the late May planting date in 2013 and the mid-May planting date in 2014. On both those planting dates, the 1.0 inch planting depth had ~4000 fewer plants/acre compared with the 2.0 inch planting depth. Overall, the 1.5 to 2.0 inch planting depth mostly had the highest plant populations with the exceptions being the 2.0 inch depth too deep for the early April planting date in 2013 and the 1.5 inch depth being too shallow for the late May planting date in 2013 and mid-May planting date in 2014.

Despite the planting date x seeding depth interaction for days to emergence and plant populations in 2013, yield did not have a planting date x seeding depth interaction (What’s Cropping Up?, vol.24, no.1, 2014, p.7-8). The 1.5 and 2.0 inch seeding depths, however, did have a significant 4% yield advantage when compared with the 2.5 and 3.0 inch seeding depths but yielded the same as the 1.0 inch seeding depth. Wet spring conditions prevailed in 2013 (3.6 inches of May precipitation), however, so soil conditions did not become dry in the top 1.0 inch until late May, which contributed to the similar yield at the 1.0, 1.5, and 2.0 planting depths in 2013. Wet spring conditions prevailed again in 2014 (4.2 inches of precipitation in May), which again negated a reduction in plants/acre on most planting dates. Root lodging did not occur in this study in 2013.

Table 3. Corn plant populations at the 4th leaf stage (V4) at four seeding depths planted on four farms from May 7 to May 15 in 2013 and from May 14 to June 2 in 2014.

<table>
<thead>
<tr>
<th>Inches</th>
<th>CAYUGA</th>
<th>LIVINGSTON</th>
<th>ORLEANS</th>
<th>SENECA</th>
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<tr>
<td>1.0</td>
<td>35,845</td>
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<td>25,995</td>
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<td>24,960</td>
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<td>31,500</td>
<td>36,780</td>
<td>21,000</td>
</tr>
<tr>
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</tr>
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<td>2.5</td>
<td>30,680</td>
<td>34,890</td>
<td>24,945</td>
<td>30,155</td>
</tr>
</tbody>
</table>

+ Bold numbers indicate the highest values that are greater than the lowest value(s) in the same column (planting depth) but cannot be separated out themselves.

Growers at three of the sites in the field-scale studies had new planters in 2013 so depth control and seed metering were optimum. Nevertheless, plant populations had year x location x seeding depth interactions in the field-scale studies, illustrating that the optimum planting depth depends equally upon soil conditions at and shortly after planting as the actual planting depth itself (Table 3). The Cayuga County site, a well-drained silt loam soil in both years, had ideal conditions at planting (moist at planting and a light shower after planting) in 2013 and plant populations (and yield) did not differ among seeding
depths. In 2014, however, dry conditions prevailed for 10 days after planting at the Cayuga Co. site and the 1.0 inch seeding depth had ~3000 fewer plants/acre compared with the other seeding depths. At Livingston County, pre-emergence herbicide injury resulted in severe damage to stand establishment in 2013 (~2.0 inch rainstorm shortly after planting) greatly reducing plant populations (and yield). In 2014, dry conditions prevailed for 2 weeks after planting and the 1.0 inch depth had more than 6000 fewer plants/acre compared with the 2.0 and 2.5 seeding depths. Obviously, the grower will not plant below the 2.0 inch depth at this site in the future.

Dry conditions also prevailed for 15 days after planting on the silty clay loam soil at the Orleans Co. site in 2013 resulting in ~2000 fewer plants/acre (and 12 bushel/acre lower yield) at the 1.0 inch compared with the 2.0 and 2.5 inch seeding depths. In 2014, a torrential downpour occurred within minutes of planting at Orleans Co. The silty clay loam soil at this site apparently developed significant soil crust upon drying, which contributed to 2000 to 4000 fewer plants/acre at the 2.0 and 2.5 inch depths compared with the 1.0 inch depth. Likewise, in 2013 at the Seneca Co. site, torrential rainstorms (3.0 inches) occurred a few days after planting resulting in significant crusting upon drying on this clay loam soil, which contributed to ~2500 to 6000 fewer plants/acre (and 10-15 fewer bushels/acre) at the 2.0 and 2.5 inch depths compared with the 1.5 inch depth. In 2014, dry conditions prevailed after planting but this no-till site had ample moisture in the top inch for similar emergence rates as from the deeper soil depths. Root lodging was not observed at the 1.0 inch depth at any sites in 2013.

In closing, soil conditions play an equal role as seeding depth does for corn stand establishment. Generally, planting depth should be shallower on heavier soils but not always as indicated by the 2.0 and 2.5 inch depths having the greatest plant populations because of dry conditions after planting at Orleans Co. in 2013. The 1.0 inch planting depth is usually too shallow because of dry soil conditions (Orleans Co. in 2013 and Cayuga and Livingston Co. in 2014 or can result in herbicide damage to the shallow-planted seed at Livingston Co. in 2013). On the other hand, torrential rains after planting can reduce plant populations, especially on heavier clay soils (Seneca Co. in 2013 and Orleans Co. in 2014). Overall, the 1.5 inch seeding depth provided the most consistent plant populations in the field-scale studies (but yields were higher at the 2.0 and 2.5 inch depths at Livingston and Orleans Co. in 2013). Once we get the yield data from 2014 we will summarize our findings. Based on the plant population data, there does not appear to be a “one size fits all optimum seeding depth” and the optimum seeding depth depends equally on soil and weather conditions as actual planting depth.
How Does Soybean Planting Depth Affect Early Plant Populations?

Bill Cox, Section of Crop and Soil Sciences, Cornell University

Soybean seeding depth typically, but not always, affects early plant populations.

Most agronomists agree that growers should plant soybeans at the 1.5 inch depth because the seed is vulnerable to drying out at shallower depths and crusting problems at deeper planting depths, both which result in reduced emergence. We conducted a variety x planting date x seeding depth study at the Aurora Research Farm in 2013 and 2014. We planted two soybean varieties on five dates from late April through mid-June at seeding depths of 1.0, 1.5, 2.0, and 2.5 inches. In addition, we conducted field-scale studies with three soybean growers who planted soybean at the same seeding depths. This news article will report on the trends in the early plant populations taken at the V2 (2nd node) stage, about 2 to 5 weeks after planting (depending upon planting date). Eventually, regression analyses will be conducted on the early plant population and yield data at the conclusion of all the studies.

Table 1. Days to emergence, averaged across two soybean varieties, planted on five dates and at four depths at the Aurora Research Farm in Cayuga Co. in 2013 and 2014.

The 1.0 vs. the 1.5 inch seeding depth emerged 0.25 to 1.25 days earlier on the first three planting dates in 2013 (Table 1). In addition, the 1.0 inch seeding depth had ~2,000 to ~11,000 more plants/acre on all planting dates in 2013 (Table 2). Moist conditions ensued after all planting dates in 2013, which negated drying out of the soybean seed at the 1.0 inch depth leading to more rapid and better early stand establishment. Obviously, planting soybeans at the 1.0 inch depth is not a problem and may be a benefit during wet springs.

Table 2. Early plant populations, averaged across two soybean varieties, planted on five dates at four depths and at a seeding rate of ~165,000 seeds/acre at the Aurora Research Farm in Cayuga Co. in 2013 and 2014.

In 2014, however, dry climatic conditions ensued from May 20 until June 10 (0.13 inches of precipitation), which probably contributed to the 0.75 to 1.25 day delayed emergence and ~3,000 to ~25,000 fewer plants/acre at the 1.0 vs. the 1.5 inch depth on the May 19 and June 12 planting dates (Tables 1 and 2). Clearly, planting soybeans at the 1.0 inch depth is a problem for stand establishment when dry conditions prevail during the late spring.

The 2.5 vs. the 1.5 inch seeding depth generally required an additional day for emergence (although an additional 3.75 days were required at the late April planting date in 2013). Also, the 2.5 vs. the 1.5 inch seeding depth mostly had >10,000 fewer plants/acre but there were two exceptions where the 2.5 vs. the 1.0 inch depth had...
~5,000 to ~10,000 more plants/acre (May 19, 2013 and May 30, 2014). Dry ensuing conditions after the May 30 planting date in 2014 probably resulted in dry conditions at the 1.5 inch seeding depth, thereby reducing emergence at that depth.

Despite the differences in early plant populations among the seeding depths at the five planting dates, soybean yields did differ among the four seeding depths on the first four planting dates in 2013 (What’s Cropping Up?, vol.24, no.1, 2014, p.1-2). Early plant populations mostly exceeded 120,000 plants/acre for all planting depths (except for the 2.5 inch seeding depth on the April 20 and June 12 planting date in 2013), which apparently were adequate to optimize yields in 2013.

The field-scale studies were planted from May 10 to May 27 in 2013 and from May 24 to June 6 in 2014 (wet May conditions delayed planting at all three farms in 2014). Consequently, soybeans only experienced warm conditions after planting in most of these studies. Nevertheless, soybeans at two farms (Livingston and Tomkins Co.) showed pronounced negative linear responses to seeding depth for early plant populations as indicated by ~9,000 to ~17,000 fewer plants/acre at the 2.5 vs. 1.0 inch seeding depth (Table 3). The Livingston Co. study in both years was on a silty clay loam soil so probably crusting or difficulty in emerging through a heavier soil from a deeper depth explains the consistent 17,000 fewer plants/acre.

Table 3. Early plant populations of soybean planted on three farms at four seeding depths at seeding rates of ~130,000 (Cayuga Co.), ~150,000 (Livingston Co.) and ~175,000 (Tomkins Co.) seeds/acre in 2013 and 2014.

<table>
<thead>
<tr>
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<td></td>
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</tr>
</tbody>
</table>

The Tompkins Co. study, however, was on a gravelly silt loam soil in both years so crusting problems were probably not the major cause for reduced emergence. Consequently, it is not clear why soybean planted at the 2.5 vs. 1.0 inch depth had ~9,000 fewer plants/acre in 2013 and ~17,000 fewer in 2014. Despite the pronounced negative linear response to seeding depth at Livingston Co. in 2013, seeding depth did not affect yield (yields ranged from 57-59 bushels/acre). Surprisingly, soybean yield showed a negative quadratic response at Cayuga Co. in 2013 (67 and 66 bushels/acre at the 1.0 and 2.5 inch depths, respectively, but only 63-64 bushels/acre at the 1.5 and 2.0 inch depths). Likewise, soybean yield showed a quadratic response (positive) at the Tomkins Co. site in 2013 (yields increased...
from 59 to 63 bushels/acre as seeding depth increased from the 1.0 to 1.5 inches then decreased to 61 bushels/acre at the deeper depths).

In conclusion, seeding depth affects early plant populations in soybean but the response is not consistent. Apparently, the 1.0 vs. the 1.5 inch seeding depth can result in greater plants/acre if wet conditions ensue after planting. If dry conditions ensue after planting, as at the Aurora Research Farm from May 20 to June 10 or at the Cayuga Co. in 2014 (located 1 mile from the Aurora Research Farm and planted on May 24), the 1.0 seeding depth and maybe the 1.5 inch seeding depth is too shallow, which can result in fewer plants/acre. The data indicates that climatic conditions after planting is equally important as the actual seeding depth in determining optimum seeding depths for soybeans. Unfortunately, climatic conditions in the first 10 days after planting are not predicted with great precision so planting at the 1.5 inch depth appears to be the best compromise.

### BEEF CATTLE COMMENTS

**August, 2014**

**Mike Baker**, Beef Cattle Extension Specialist, Cornell University

**10th Biennial Beef Tour**

“**The Mountain State Tour**” to West Virginia

**September 24-28, 2014**

This year we will be traveling to West Virginia by bus. The focus of this year’s tour is marketing feeder calves, backgrounding and stocker operations, and of course a fun night. A tentative agenda and printable registration form can be found at: [http://beefcattle.ansci.cornell.edu/eventsprograms/](http://beefcattle.ansci.cornell.edu/eventsprograms/).

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<tr>
<td></td>
<td>Date due September 1st</td>
</tr>
</tbody>
</table>

*Includes bus, lodging and some meals.

For questions, call 607-255-5923 or email mjb28@cornell.edu.

### BQA-UPDATE – CURT PATE TO HOLD LOW STRESS HANDLING CLINICS

**August 5 & 6, 2014**

Mark your calendar to attend a special Low Stress Cattle Handling Clinic led by renowned Montana rancher and stockmanship instructor Curt Pate and sponsored by the NY Beef Quality Assurance program. These special clinics focus on handling methods that improve gathering, penning, chute work and hauling of cattle. Emphasis is placed on ways to increase cattle performance by reducing handling stress and how the principles presented have an economic – as well as “quality of life” – benefit when applied in one’s operation.

Cattle handling is a key component to Beef Quality Assurance and is important for both cattlemen and the industry for three key reasons:

- **Welfare**: Improved cattle handling leads to improved public perception; less injury to handlers and cattle; less carcass damage and trim loss.
- **Performance**: Increased efficiency; increased gain; less investment in veterinary intervention; less investment into facilities and repair.
- **Quality of Life**: Improved profitability; sustainable family operations; enjoyment of the beef farming lifestyle.

For all BQA Certified producers, the clinics will count for the required continuing education credits for BQA re-certification.

The clinics are free of charge and sponsored by the Beef Checkoff, New York Beef Council, New York Beef Producers Association and Cornell University Extension.
Register today for the clinic of your choice:
Date: Tuesday, August 5, 2014
Registration & Meal: 5:00 p.m.
Program: 6:00 to 8:00 p.m.
Location: Empire Livestock, Dryden, NY

Date: Wednesday, August 6, 2014
Registration & Meal: 5:00 p.m.
Program: 6:30 – 8:30 p.m.
Location: Fleur-De-Lis Farm, 2497 Canoga Rd, Seneca Falls, NY

Preregistration is required. Contact the NY Beef Council at 315.339.6922 or email cgillis@nybeef.org.

EXPANDING YOUR HERD? “Choose a cow that is profitable in your market and environment”.

(Editor’s note, this article first appeared in the May issue of Farming Magazine, http://www.farmingmagazine.com/)

What’s the optimum cow? Like all good Extension responses, the answer is “it depends”. It depends on the goals of your business, your feed resource, your management options, your market and your personal preference.

Dr. Harlan Ritchie, Professor Emeritus wrote a review of the factors that affect the efficiency of the cow (Ritchie 2001). There is biological efficiency and economic efficiency. I will summarize the review, but I encourage you to go to https://www.msu.edu/~ritchieh/papers/optimumcow.html, for some excellent insight into the optimum cow.

**Biological efficiency** is mostly related to the maintenance requirement of the cow. According to Ritchie “high maintenance cows tend to have the following characteristics: high milk production, high visceral organ weight, high body lean mass, low body fat mass, high output, and high input. Conversely, low maintenance cows tend to be: low in milk production, low in visceral organ weight, low in body lean mass, high in body fat mass, low output, and low input”. In general, this means that higher milking breeds (Simmental, Shorthorn, dairy and crosses) will be less efficient than lower milking breeds (Hereford, Angus, Charolais and crosses). However in conditions like the northeast where we have abundant rain and therefore high quality forage, there is little difference in biological efficiency between biological types. In fact contrary to popular belief, measures of mature cow size (weight, height, etc.) are not correlated with biological efficiency. Therefore even with increased maintenance requirement of larger breeds, the increased output (weaning weight or carcass weight) favors the

FENCING

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V Belts
larger biological types; the best match for our (New York) environment is the British x larger Continental.

**Economic efficiency** examines inputs relative to outputs; the goal being to decrease inputs and/or increase outputs. Inputs: feed energy consumed per unit of weight sold was not related to profit. Outputs: Crossbred cows produced greater output due to increased conception rate and weaning weight, compared to straight bred dams and therefore were more profitable. F1 dams (AN x Hereford and SM x Hereford) yielded consistently higher profits than either straight bred Herefords or ¾- Simmentals, with ¼- Simmentals being intermediate.

The above measures evaluated economic efficiency to weaning. When calves were fed low Choice finish and priced on carcass value:

1. Among 2-breed rotations, British x British crosses were most economically efficient, followed by British x Continental crosses.
2. Among 3-breed rotations, it made little difference whether 2 British or Continental breeds were used in the cross.

Ritchie concludes (and it is as true today as it was when he wrote the article in 1991) “Because of the beef industry’s stated need for a dramatic improvement in uniformity and consistency, one is occasionally lulled into thinking about abandoning crossbreeding and returning to straight breeding. However, the compelling evidence in this study favoring the use of the crossbred cow as a means of harvesting the significant economic benefits of maternal heterosis quickly dispels that notion.”

**Production and pasture management.**
Research conducted at Cornell University (Andersson, Fox et al. 1990) also sheds some light on the most profitable combination of biological types and forage management. Medium and large frame Angus cows were bred to an Angus (Medium) or Simmental (High) bull. A description of the cows is shown in Table 1.

Then based on data collected on dry matter production of four grazing management systems, several scenarios were modeled using COWHERD software (Perry, Fox et al. 1998). Each cow production group was modeled using Intensive Rotation (IR – 16 paddocks, moved every 3 – 5 days), Moderate Rotation (MR – 4 paddocks moved every 5 – 14 days), Continuous Improved (CI – limed and fertilized) and Continuous Unimproved (CU – no lime or fertilizer). Stocking rate was determined by forage availability to meet nutrient requirements of the cow/calf pair on a constant 110 acres. The profitability of each combination of cow production level and pasture management is shown in Table 2.

The most productive grazing system was the intensive rotational and therefore had the greatest carrying capacity. The high producing cows had the highest net farm income because of the greater weaning weight and therefore production/acre was maximized. This is important because each farm in this system has the same charge for land, buildings and equipment. Maximizing production dilutes overhead cost. The next most profitable farm was medium cows on a moderate rotational grazing system. On a per cow basis, the continuously grazed unimproved pastures were second most profitable. This system had the lowest amount of input (lime, fertilizer, and labor) and therefore could support a lower level of production. In all measures, the continuous improved had the lowest profitability. The additional cost of lime and fertilizer did not increase forage yields and therefore production to offset these added costs.

**Carcass weight.** A final note on market; an ongoing research project with a NY processor is designed to determine the factors that affect retail value of beef and profitability. The carcass measurements hot carcass weight, backfat, ribeye area, kidney pelvic and heart fat and marbling have been collected. At each slaughter 2 carcasses are processed uniformly, prices are assigned to each cut and total retail value of the carcass is calculated. A regression analysis was performed using the
carcass measurements to develop an equation to predict total retail value. The result of this analysis showed that hot carcass weight, back fat, ribeye area and kidney, pelvic and heart fat explained 86% of the variation in total retail value. From a statistical standpoint, this is a very accurate equation. Once we know the retail value of a carcass we then subtracted all of the production costs (feeder purchase price, feed cost, yardage, processing and slaughter) to determine profit.

Figure 1 shows the influence of hot carcass weight on profitability. There are two things we can take away from this figure. First there is tremendous variation in profitability, even though these cattle only represent 5 farms. The range in profitability was -$388/hd. to +$265/hd. Clearly there is a lot of work to do in increasing consistency. The second point is that the heavier the carcass the more profit it generates.

Producing heavier carcasses requires bigger cows or moderate sized cows bred to a larger farmed bull in a terminal cross system. While our resources can support heavier cows, there is a limit. Single trait selection on carcass weight EPDs will result in larger calves, but if replacements are retained, the weight of the cow will increase over time to unacceptable levels.

Even for the direct marketer that may want smaller carcasses to satisfy their customers, profitability will increase with carcass weight within the limits of market specifications.

**Summary**
1. In feed abundant environments typical of the Northeast U.S., biological efficiency favors the larger biological type – Continental x British.
2. Cross bred dams (An x Hereford or Continental x British) were more profitable than straight bred dams due to higher production (lb. weaned/cow exposed).
3. When measuring the system from calf to finish, the British x British and Continental x British crosses were most economically efficient.
4. If profit maximization is the goal, use intensive rotation with high producing cows.
5. Continuous grazing is not a bad word, and when correctly stocked, can be profitable.
6. All things being equal (reproduction and pounds weaned/female exposed), carcass weight trumps other meat quality factors.
7. Optimize production for the market being targeted.
8. Finally, if you just like black cows back dropped against a white fence, accept that profit is not a motivator for your farm and enjoy the scenery.

**References**
Table 1. Description of Angus cows and calf performance

<table>
<thead>
<tr>
<th>Production System</th>
<th>Medium (M)</th>
<th>High (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow frame score</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Cow weight, lb.</td>
<td>1209</td>
<td>1268</td>
</tr>
<tr>
<td>Calf sire</td>
<td>AN</td>
<td>SM</td>
</tr>
<tr>
<td>Birth weight, lb.</td>
<td>75</td>
<td>89</td>
</tr>
<tr>
<td>Weaning weight, lb.</td>
<td>461</td>
<td>565</td>
</tr>
<tr>
<td>205 d weaning weight, lb.</td>
<td>526</td>
<td>626</td>
</tr>
<tr>
<td>ADG to weaning</td>
<td>2.1</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Table 2. Profitability of eight beef herd management systems

<table>
<thead>
<tr>
<th>Pasture management system</th>
<th>Cow production level</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IR</td>
<td>MR</td>
<td>CI</td>
</tr>
<tr>
<td>Annual forage produced, t</td>
<td>393</td>
<td>246</td>
<td>169</td>
</tr>
<tr>
<td>No. cows</td>
<td>70</td>
<td>43</td>
<td>30</td>
</tr>
<tr>
<td>Net farm income, $</td>
<td>2814</td>
<td>873</td>
<td>-2195</td>
</tr>
<tr>
<td>Net farm income/acre, $/ac</td>
<td>26</td>
<td>8</td>
<td>-20</td>
</tr>
<tr>
<td>Net farm income/cow, $/cow</td>
<td>40</td>
<td>20</td>
<td>-73</td>
</tr>
</tbody>
</table>

\(^1\)Total forage produced on 110 acres, expressed as hay equivalents
Footrot Can Be More Problematic In Wet Years
Kevin Gould,
Michigan State University Extension

**Foundations are important. Feet are the foundation of cattle and this may be a year when producers see increased incidence footrot in the herd.**

Footrot causes lameness and reddening of the interdigital tissue (between the hoof) and swelling of the foot, causing spreading of the toes. | Michigan State University Extension

Footrot is generally caused by common bacteria found in the soil. The most common causes of footrot include: *Fusobacterium necrophorum* and *Dichelobacter nodosus* (more common in sheep), and *Bacteroides melaninogenicus* (more common in cattle). The resulting lameness will reduce mobility, weight gain and reproductive reproductive performance.

**Clinical signs**
Lameness is usually the first sign of an animal infected with footrot. Signs can vary from barely noticeable limping to severe lameness in one or more feet. Lameness is typically followed by reddening of the interdigital tissue (between the hoof) and swelling of the foot, causing spreading of the toes. Swelling can extend above the hoof in the areas of the coronary band and fetlock and lead to spreading of the dewclaws. As the disease progresses, exudates between the toes with a distinct odor are typically noted. One or more feet may be affected simultaneously.

**Diagnosis**
Footrot is typically diagnosed by the distinctive lesions and distinct odor. Any interdigital fissures or cracks with a
characteristic odor should be treated as footrot. A bacterial culture can be done, but is rarely necessary.

Treatment
The interdigital tissue should be cleaned and disinfected. Use of broad spectrum antimicrobials early in the course of the disease are usually effective. Penicillin and oxytetracycline are effective antibiotics if started early in the disease process and given at the recommended dosage. Sulfonamides work well too. If animals do not respond to treatment within three days, it may not be “just foot rot” and additional action should be taken. These animals often have joint involvement that may require more aggressive treatment.

Prevention
According to Michigan State University Extension, both cattle and sheep are susceptible to this disease due to interdigital trauma. Management practices that help reduce interdigital trauma will help decrease the incidence of foot rot. Wet environmental conditions soften the interdigital space and predispose to footrot. Drainage should be maximized around water tanks and feed bunks to decrease muddy conditions.
Mounds of soil can be created in feedlots help to help promote drainage and give cattle a dry place to lie. Walk-through foot baths can be used in alleyways where cattle must walk in dairy operations. These are only effective if the feet are not muddy and the medicinal concentration and cleanliness of the bathes are maintained. Move water tanks, mineral tubs and feed to higher, drier places to reduce the frequency of cattle in muddy places. Fence off areas that may injure feet.

Anyone who has experienced a troubling outbreak of foot rot know the challenges it creates with sorting, handling and treating livestock often in summer grazing systems. Management of the environment is the best method to prevent foot rot infections. When diagnosed, administer appropriate antimicrobials at the labeled dosage level as soon as possible. Managing foot health will keep your cattle on a good foundation!

My “New Barn” is 12 Years Old?
John Tyson, PSU ag engineer

What is the difference between a barn built in 2014 and one built in 2002? It is likely there are multiple opportunities to upgrade an older barn and improve cow comfort.

A couple of weeks ago while on a farm visit a producer asked, “My new barn is now 12 years old, what things should I be looking at to update for cow comfort?” That question kind of caught me by surprise, but also got me thinking about how many ‘new’ dairy housing facilities in PA and the Northeast US are just like his, 12 years old. So what is the difference between a barn from 2014 and one from 2002?

The first thing I thought of was that in 2002 a big freestall was 48 inches wide and 8 feet long, even 7.5-foot head-to-head stalls were long stalls. Today, that is a heifer stall and standard cow stalls are 9 to 9.5 feet long. So what can be done to make these 12-year-old stalls longer? Well you can either move the rear curb backwards or the front wall forwards, it’s as simple as that. Moving the rear curb means the scrape alley will be a little narrower, but often the added cow comfort is worth more. On outside rows, the curtain wall can often be leaned forward 18 to 24 inches at the bottom to gain lunge room. Along with the freestall length, take a look at the other stall dimensions of neck rail position and brisket.
locator placement. The neck rail should be 48 to 50 inches above the stall bed and 68 to 70 inches from the rear curb. The brisket locator should be 68 inches forward of the curb and no more than 4 inches high. What does that stall surface look like? Would adding some more bedding make the stall more comfortable? Maybe a bedding retainer is the answer.

The next thing that came to mind was what does the walking surface look like, or feel like, to the cow? Many 10-plus-year-old concrete floors will be in need of some resurfacing. All those trips with scrapers are bound to smooth off the floor, leaving it slick. Would sawing new grooves at a 45 degree angle to the existing ones improve traction? Perhaps the grooves are fine but the area between the grooves has become slick. Then maybe using some type of milling or scarifying procedure will return that broom finish. Finally, take a look to see if there are areas where resilient flooring such as rubber belting could be used. Often this is a good option for holding areas and milking stalls where cows will be standing for some time.

Is the ventilation and heat abatement system up to the job? The goal is to provide 11 square feet of windward opening (one sidewall and one endwall) per cow within a naturally ventilated shelter. Are there things that could be done to open more of the endwall or sidewall? Increasing the opening of a shelter is going to increase the air exchange rate for summer weather. Next look at the fans within the shelter, are they 10-plus-years-old, just like the shelter itself? For heat abatement the goal is to get the air velocity around the cows in stalls over a minimum of 3 to 5 mph. Studies and experience have taught us that fans spaced approximately 10 times their diameter, over each row of stalls, can achieve this goal.

Can evaporative cooling be added with the use of sprinklers or misters in the holding area or at the feed bunk?

If your new barn is 12 years old, or maybe even just 5 years old, think about how you would design and build that shelter today. Are there things that can be done to get closer to the stall design, ventilation, or flooring that would be used today? As we strive for healthier, more productive cows with greater longevity, achieving better cow comfort is an area that will need continued focus.

---

**Steuben County Potato Twilight Meeting**

*Steuben County Potato Variety Trial Site*

*Mahany Farms*

*Rte 36, Arkport NY*

*Tuesday August 19, 2014*

*4:00 pm until*

*No Cost to Attend*

*Don Halseth will review the performance of the variety trial. There will be time for discussion.*

*Dinner to follow.*

*Please pre-register by Friday August 15 by calling Stephanie at 607-583-3240 or email sms64@cornell.edu*
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COMING EVENTS:

August 5-7 Empire Farm Days
Rodman Lott & Sons Farm, Seneca Falls

August 12-17 Steuben County Fair
Bath

August 19 Potato Trial Field Day
Mahany Farm, Rte 36, Arkport
4:00 pm until
Variety Trial review and discussion.
Dinner to Follow.
No Cost to attend.
Pre-register by August 15 by calling
Stephanie at 607-583-3240 or
email at sms64@cornell.edu

TRADING POST:

Wanted: Subsoiler for primary tillage. Farmer in Hammondsport seeking to rent subsoiler with 1 or 2 shanks, minimum depth of 12”. Relatively small parcel being tilled, only need for a weekend at most. If interested please call Peter at (914) 588 2860.

For Sale: 2005 JD6615 4WD Tractor, cab with heat & air, new front tires, good condition-$39,900; NH900 Forage Harvester, excellent condition, used very little, new knives & shear bar with hay pickup - $22,000; Kuhn Knight 3130 Mixer with scale - $10,000. Call between 7am and 7pm-607-382-6191