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2019

## Test 2215: Kubota M7-152

Nebraska Tractor Test Laboratory

University of Nebraska-Lincoln, [tractortestlab@unl.edu](mailto:tractortestlab@unl.edu)

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# NEBRASKA OECD TRACTOR TEST 2215—SUMMARY 1162

## KUBOTA M7-152 DIESEL

### 30 SPEED

#### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption		Mean Atmospheric Conditions
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)	
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>						
<b>Rated Engine Speed—(PTO speed—1053 rpm)</b>						
125.21 (93.37)	2101	8.06 (30.52)	0.450 (0.274)	15.53 (3.06)	0.25 (0.94)	Fuel used during active exhaust regeneration-0.11 gal (0.43 l) (see note 1, p.2)
<b>Standard Power Take-off Speed (1000 rpm)</b>						
140.74 (104.95)	1995	8.55 (32.38)	0.425 (0.258)	16.45 (3.24)	0.31 (1.16)	
<b>Maximum Power (1 hour)</b>						
142.53 (106.29)	1900	8.37 (31.70)	0.411 (0.250)	17.02 (3.35)	0.32 (1.22)	

#### VARYING POWER AND FUEL CONSUMPTION

125.21 (93.37)	2101	8.06 (30.52)	0.450 (0.274)	15.53 (3.06)	0.25 (0.94)	Air temperature
107.74 (80.34)	2125	7.25 (27.46)	0.471 (0.286)	14.85 (2.93)	0.19 (0.72)	70°F (21°C)
81.54 (60.81)	2152	6.08 (23.02)	0.521 (0.317)	13.41 (2.64)	0.14 (0.54)	Relative humidity
55.29 (41.23)	2180	4.97 (18.82)	0.629 (0.382)	11.12 (2.19)	0.08 (0.29)	17%
28.03 (20.91)	2203	3.80 (14.37)	0.946 (0.576)	7.39 (1.45)	0.05 (0.20)	Barometer
2.61 (1.95)	2228	2.57 (9.73)	6.875 (4.182)	1.02 (0.20)	0.04 (0.15)	29.06" Hg (98.40 kPa)

Maximum torque - 447 lb.-ft. (606 Nm) at 1500 rpm  
 Maximum torque rise - 42.9%  
 Torque rise at 1680 engine rpm - 38%  
 Power increase at 1900 engine rpm - 13.8%

#### DRAWBAR PERFORMANCE

##### UNBALLASTED - FRONT DRIVE ENGAGED FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	D.E.F. Consumption Hp.hr/gal (kW.h/l)	Temp. °F(°C)	Barom. inch Hg (kPa)
<b>Power at Rated Engine Speed—9th (B3) Gear</b>								
108.31 (80.77)	8789 (39.10)	4.63 (7.44)	2101	2.5	0.468 (0.285)	14.92 (2.94)	0.018 (0.011)	193 (89) 49 (9) 28.87 (97.77)
<b>75% of Pull at Rated Engine Speed—9th (B3) Gear</b>								
83.77 (62.47)	6604 (29.37)	4.76 (7.66)	2149	1.9	0.522 (0.318)	13.38 (2.64)	0.019 (0.011)	189 (87) 40 (4) 29.08 (98.48)
<b>50% of Pull at Rated Engine Speed—9th (B3) Gear</b>								
57.11 (42.59)	4406 (19.60)	4.86 (7.82)	2176	1.2	0.632 (0.384)	11.06 (2.18)	0.015 (0.009)	188 (87) 41 (5) 29.08 (98.48)
<b>75% of Pull at Reduced Engine Speed—13th (B5) Gear</b>								
83.52 (62.28)	6609 (29.40)	4.74 (7.63)	1533	1.8	0.446 (0.271)	15.67 (3.09)	0.028 (0.017)	187 (86) 41 (5) 29.07 (98.44)
<b>50% of Pull at Reduced Engine Speed—13th (B5) Gear</b>								
57.06 (42.55)	4405 (19.59)	4.86 (7.82)	1564	1.2	0.509 (0.309)	13.74 (2.71)	0.026 (0.016)	186 (86) 41 (5) 29.07 (98.44)

**Location of tests:** Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

**Dates of tests:** October 30 to November 7, 2019

**Manufacturer:** Kubota Farm Machinery Europe, SAS Route de Socx, 59380 Bierne France

**CONSUMABLE FLUIDS, OIL and TIME:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.8394 **Fuel weight** 6.989 lbs/gal (0.837 kg/l) **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal (1.087 kg/l) **Oil SAE 10W30 API service classification CJ-4** **Transmission and hydraulic lubricant** Kubota Super UDT2 fluid **Front axle lubricant** Kubota Super UDT2 fluid **Total time engine was operated:** 20.0 hours

**ENGINE: Make** Kubota **Diesel Type** four cylinder vertical with turbocharger, air to air intercooler and D.E.F. (diesel exhaust fluid) exhaust treatment **Serial No.** 3KE0354 **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.646" x 5.512" (118.0 mm x 140.0 mm) **Compression ratio** 17.5 to 1 **Displacement** 374 cu in (6124 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and prestrainer **Fuel cooler** radiator for pump return fuel **Exhaust** DOC (diesel oxidation catalyst), SCR (selective catalyst reduction) and regenerative DPF (diesel particulate filter) integrated within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 58.6 - 60.6 lb/h (26.6 - 27.5 kg/h) **High idle:** 2200 - 2250 rpm **Turbo boost:** nominal 13.8 - 16.7 psi (95 - 115 kPa) as measured 14.7 psi (101 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** M7152D10502\* **Tread width** rear 60.0" (1524 mm) to 120.0" (3048 mm) front 60.0" (1524 mm) to 76.5" (1942 mm) **Wheelbase** 107.1" (2720 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (6) range operator controlled power shift **Nominal travel speeds mph (km/h)** first 1.90 (3.07) second 2.25 (3.61) third 2.65 (4.27) fourth 3.12 (5.03) fifth 3.41 (5.49) sixth 3.69 (5.94) seventh 4.02 (6.46) eighth 4.34 (7.00) ninth 4.74 (7.63) tenth 5.13 (8.26) eleventh 5.58 (8.98) twelfth 6.04 (9.73) thirteenth 6.60 (10.63) fourteenth 7.14 (11.49) fifteenth 7.77 (12.51) sixteenth 8.42 (13.54) seventeenth 8.68 (13.97) eighteenth 9.95 (16.01) nineteenth 10.12 (16.27) twentieth 11.71 (18.85) twenty-first 12.02 (19.33) twenty-second 14.04 (22.58)

## DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED - 2100 ENGINE RPM MAXIMUM POWER IN SELECTED GEARS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp. °F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st(A1) Gear										
67.12 (50.05)	14673 (65.27)	1.72 (2.76)	2161	14.3	0.595 (0.362)	11.74 (2.31)	0.016 (0.010)	189 (87)	44 (7)	28.87 (97.77)
2nd(A2) Gear										
80.39 (59.95)	14450 (64.27)	2.09 (3.36)	2147	10.0	0.545 (0.331)	12.83 (2.53)	0.021 (0.013)	189 (87)	44 (7)	28.87 (97.77)
3rd(A3) Gear										
94.69 (70.61)	14225 (63.27)	2.50 (4.02)	2135	8.0	0.509 (0.310)	13.73 (2.71)	0.019 (0.012)	190 (88)	48 (9)	28.89 (97.83)
4th(A4) Gear										
105.20 (78.44)	13291 (59.12)	2.97 (4.78)	2100	5.1	0.483 (0.294)	14.46 (2.85)	0.019 (0.011)	193 (89)	48 (9)	28.89 (97.82)
5th(B1) Gear										
107.42 (80.10)	12337 (54.88)	3.27 (5.25)	2100	4.4	0.472 (0.287)	14.82 (2.92)	0.019 (0.011)	193 (89)	49 (9)	28.87 (97.77)
6th(A5) Gear										
104.65 (78.04)	11027 (49.05)	3.56 (5.73)	2100	3.7	0.486 (0.296)	14.38 (2.83)	0.019 (0.011)	195 (91)	48 (9)	28.87 (97.77)
7th(B2) Gear										
106.40 (79.34)	10269 (45.68)	3.89 (6.26)	2100	3.3	0.477 (0.290)	14.64 (2.88)	0.019 (0.012)	193 (89)	49 (9)	28.87 (97.77)
8th(A6) Gear										
102.95 (76.77)	9139 (40.65)	4.23 (6.80)	2100	3.0	0.493 (0.300)	14.17 (2.79)	0.018 (0.011)	194 (90)	49 (9)	28.87 (97.77)
9th(B3) Gear										
108.31 (80.77)	8789 (39.10)	4.63 (7.44)	2101	2.5	0.468 (0.285)	14.92 (2.94)	0.018 (0.011)	193 (89)	49 (9)	28.87 (97.77)
10th(C1) Gear										
107.51 (80.17)	8040 (35.76)	5.02 (8.07)	2100	2.4	0.473 (0.288)	14.78 (2.91)	0.019 (0.011)	192 (89)	50 (10)	28.88 (97.80)
11th(B4) Gear										
105.78 (78.88)	7260 (32.29)	5.47 (8.80)	2100	2.3	0.479 (0.292)	14.58 (2.87)	0.020 (0.012)	194 (90)	50 (10)	28.87 (97.77)
12th(C2) Gear										
105.99 (79.04)	6695 (29.78)	5.94 (9.56)	2100	1.9	0.477 (0.290)	14.65 (2.89)	0.021 (0.013)	196 (91)	49 (9)	28.89 (97.82)
13th(B5) Gear										
104.03 (77.58)	6008 (26.72)	6.49 (10.44)	2100	1.8	0.486 (0.296)	14.37 (2.83)	0.020 (0.012)	196 (91)	50 (10)	28.88 (97.80)
14th(C3) Gear										
106.32 (79.28)	5669 (25.21)	7.03 (11.31)	2100	1.6	0.477 (0.290)	14.64 (2.88)	0.017 (0.010)	197 (91)	49 (9)	28.90 (97.87)
15th(B6) Gear										
101.00 (75.32)	4937 (21.96)	7.67 (12.34)	2099	1.4	0.500 (0.304)	13.97 (2.75)	0.022 (0.013)	197 (92)	50 (10)	28.88 (97.80)
16th(C4) Gear										
103.17 (76.93)	4656 (20.71)	8.31 (13.37)	2100	1.2	0.491 (0.299)	14.23 (2.80)	0.021 (0.013)	196 (91)	49 (9)	28.89 (97.83)

twenty-third 14.65 (23.56) twenty-fourth 16.69 (26.84) twenty-fifth 17.27 (27.78) twenty-sixth 19.60 (31.52) twenty-seventh 20.40 (32.80) twenty-eighth 24.04 (38.72) twenty-ninth 24.86 (40.00) thirtieth 24.86 (40.00) electronically limited reverse 2.05 (3.30), 2.85 (4.59), 3.67 (5.90), 3.97 (6.39), 5.10 (8.21), 5.52 (8.89), 7.10 (11.43), 7.69 (12.37), 9.31 (14.98), 10.70 (17.22), 12.94 (20.83), 15.87 (25.54), 16.78 (27.00), 16.78 (27.00) electronically limited **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2005 or 1608 engine rpm and 1000 rpm at 1995 or 1600 engine rpm **Unladen tractor mass** 15560 lb (7058 kg)

**NOTE 1:** The manufacturer declares that the average time between active regenerations is 30 hours.

**NOTE 2:** This tractor has a power management system that provides an engine power increase when the PTO is engaged and for travel speeds of 12 mph (20 km/h) and higher.

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. The manufacturer's remote hydraulic flow claim of 21 GPM (80 l/min) with fixed displacement pump was not verified. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2215**, Nebraska Summary 1162, January 8, 2020.

Roger M. Hoy  
Director

M.F. Kocher  
J.D. Luck  
S.K. Pitla  
Board of Tractor Test Engineers

Horizontal distances of drawbar hitch point behind rear wheel axis - 30.8"(782 mm), 33.5"(852 mm), 36.7"(932 mm)

#### TIRES AND WEIGHT

**Rear Tires** - No., size, ply & psi(kPa)  
**Front Tires** - No., size, ply & psi(kPa)  
**Height of Drawbar**  
**Static Weight with operator** - Rear  
- Front  
- Total

#### Tested Without Ballast

Two 480/80R42;\*\*\*;14(95)  
Two 420/85R28;\*\*\*;14(95)  
17.0 in (430 mm)  
9040 lb (4100 kg)  
6695 lb (3037 kg)  
15735 lb (7137 kg)

**DRAWBAR PERFORMANCE**  
**UNBALLASTED - FRONT DRIVE ENGAGED - 1900 ENGINE RPM**  
**MAXIMUM POWER IN SELECTED GEARS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	D.E.F. Consumption lb/hp.hr (kg/kW.h)	Temp.°F(°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
1st(A1) Gear										
67.14 (50.06)	14716 (65.46)	1.71 (2.75)	2160	14.6	0.597 (0.363)	11.70 (2.31)	0.017 (0.010)	189 (87)	44 (7)	28.87 (97.77)
2nd(A2) Gear										
80.67 (60.16)	14497 (64.48)	2.09 (3.36)	2147	10.0	0.542 (0.330)	12.89 (2.54)	0.020 (0.012)	189 (87)	45 (7)	28.88 (97.80)
3rd(A3) Gear										
94.92 (70.78)	14253 (63.40)	2.50 (4.02)	2135	8.0	0.506 (0.308)	13.80 (2.72)	0.019 (0.012)	191 (88)	48 (9)	28.89 (97.83)
4th(A4) Gear										
107.28 (80.00)	13993 (62.24)	2.88 (4.63)	2064	6.8	0.482 (0.293)	14.50 (2.86)	0.020 (0.012)	192 (89)	48 (9)	28.88 (97.80)
5th(B1) Gear										
113.83 (84.88)	13766 (61.23)	3.10 (4.99)	2025	6.1	0.463 (0.282)	15.08 (2.97)	0.019 (0.012)	194 (90)	49 (9)	28.87 (97.77)
6th(A5) Gear										
117.13 (87.34)	13596 (60.48)	3.23 (5.20)	1944	5.9	0.457 (0.278)	15.31 (3.02)	0.023 (0.014)	196 (91)	48 (9)	28.87 (97.77)
7th(B2) Gear										
121.66 (90.72)	13164 (58.55)	3.47 (5.58)	1901	5.1	0.441 (0.268)	15.86 (3.12)	0.022 (0.014)	195 (90)	49 (9)	28.87 (97.77)
8th(A6) Gear										
120.01 (89.49)	11899 (52.93)	3.78 (6.08)	1900	4.0	0.447 (0.272)	15.65 (3.08)	0.024 (0.015)	196 (91)	49 (9)	28.87 (97.77)
9th(B3) Gear										
124.39 (92.75)	11283 (50.19)	4.13 (6.65)	1900	3.9	0.430 (0.262)	16.25 (3.20)	0.024 (0.015)	196 (91)	49 (9)	28.87 (97.77)
10th(C1) Gear										
124.89 (93.13)	10413 (46.32)	4.50 (7.24)	1900	3.3	0.431 (0.262)	16.23 (3.20)	0.024 (0.015)	194 (90)	50 (10)	28.87 (97.77)
11th(B4) Gear										
123.60 (92.17)	9446 (42.02)	4.91 (7.90)	1900	2.9	0.434 (0.264)	16.11 (3.17)	0.024 (0.015)	197 (91)	49 (9)	28.87 (97.77)
12th(C2) Gear										
122.80 (91.57)	8633 (38.40)	5.33 (8.58)	1900	2.6	0.437 (0.266)	16.00 (3.15)	0.023 (0.014)	197 (92)	49 (9)	28.89 (97.83)
13th(B5) Gear										
120.68 (89.99)	7754 (34.49)	5.84 (9.40)	1899	2.2	0.444 (0.270)	15.76 (3.10)	0.024 (0.015)	197 (91)	50 (10)	28.88 (97.80)
14th(C3) Gear										
123.69 (92.24)	7330 (32.61)	6.33 (10.19)	1900	2.1	0.432 (0.263)	16.16 (3.18)	0.023 (0.014)	196 (91)	49 (9)	28.89 (97.83)
15th(B6) Gear										
119.26 (88.93)	6474 (28.80)	6.91 (11.12)	1900	1.9	0.449 (0.273)	15.55 (3.06)	0.026 (0.016)	196 (91)	49 (9)	28.88 (97.80)
16th(C4) Gear										
122.08 (91.04)	6103 (27.15)	7.51 (12.08)	1901	1.5	0.440 (0.268)	15.88 (3.13)	0.022 (0.014)	196 (91)	49 (9)	28.89 (97.83)
17th(D1) Gear										
122.34 (91.23)	5935 (26.40)	7.73 (12.43)	1900	1.4	0.437 (0.266)	16.01 (3.15)	0.024 (0.015)	196 (91)	49 (9)	28.90 (97.87)
18th(C5) Gear										
118.06 (88.04)	4986 (22.18)	8.88 (14.29)	1899	1.3	0.451 (0.274)	15.51 (3.05)	0.024 (0.015)	196 (91)	49 (9)	28.89 (97.83)

## Shiftable PTO Performance

### Economy mode

#### 1000 PTO rpm @ 1600 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
135.48 (101.03)	1600	7.50 (28.38)	0.387 (0.235)	18.07 (3.56)	0.32 (1.23)
101.55 (75.73)	1602	5.92 (22.39)	0.407 (0.248)	17.17 (3.38)	0.26 (0.98)
67.69 (50.48)	1598	4.38 (16.58)	0.452 (0.275)	15.45 (3.04)	0.16 (0.62)
33.80 (25.21)	1600	2.92 (11.05)	0.604 (0.367)	11.58 (2.28)	0.06 (0.22)
2.28 (1.70)	1605	1.62 (6.15)	4.979 (3.028)	1.40 (0.28)	0.03 (0.12)

### Normal mode

#### 1000 PTO rpm @ 1995 engine rpm

Power HP (kW)	Crank shaft speed rpm	Diesel Consumption		D.E.F. Consumption	
		Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Gal/hr (l/h)
135.46 (101.01)	1993	8.29 (31.38)	0.428 (0.260)	16.34 (3.22)	0.31 (1.17)
101.40 (75.61)	1996	6.56 (24.83)	0.452 (0.275)	15.46 (3.05)	0.20 (0.77)
67.67 (50.46)	1994	5.05 (19.11)	0.522 (0.317)	13.40 (2.64)	0.14 (0.52)
33.81 (25.21)	1995	3.44 (13.03)	0.711 (0.433)	9.82 (1.94)	0.07 (0.25)
2.20 (1.64)	2001	2.11 (7.98)	6.707 (4.079)	1.04 (0.21)	0.03 (0.11)

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive	
	Engaged dB(A)	Disengaged dB(A)
At no load in 9th (B3) gear	71.7	70.4
Bystander in 28th (E4) gear		82.9

## HYDRAULIC PERFORMANCE

CATEGORY: 3

Quick Attach: None

OECD Static test

Maximum force exerted through whole range: 14372 lbs (63.9 kN) 2 x 100 mm Lift cylinders

i) Maximum observed pressure: 2940 psi (203 bar)

**three outlet sets combined**

ii) Pump delivery rate at minimum pressure and rated engine speed: 30.8 GPM (116.4 l/min)

iii) Pump delivery rate at maximum hydraulic power: 28.4 GPM (107.6 l/min)  
 Delivery pressure: 2863 psi (197 bar)  
 Power: 47.5 HP (35.4 kW)

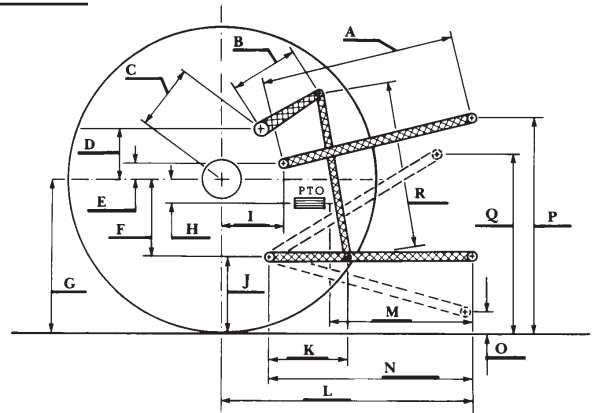
**single outlet set**

ii) Pump delivery rate at minimum pressure and rated engine speed: 30.5 GPM (115.5 l/min)

iii) Pump delivery rate at maximum hydraulic power: 29.0 GPM (109.9 l/min)  
 Delivery pressure: 2570 psi (177 bar)  
 Power: 43.5 HP (32.5 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	mm
A	28.7	730
B	12.9	328
C	19.4	492
D	17.5	445
E	13.0	330
F	9.1	230
G	34.5	875
H	9.8	249
I	16.6	422
J	25.4	645
K	18.7	475
L	46.4	1178
M	25.0	635
N	38.5	978
O	9.1	230
P	52.4	1330
Q	38.8	985
R	32.9	835



### RECOMMENDED CITATION FORMAT:

NTTL.(2020). Nebraska OECD tractor test 2215 for Kubota M7-152 Diesel.

Lincoln, NE:Nebraska Tractor Test Laboratory. Retrieved from <http://tractortestlab.unl.edu>



**KUBOTA M7-152 DIESEL**

Institute of Agriculture and Natural Resources  
 University of Nebraska–Lincoln