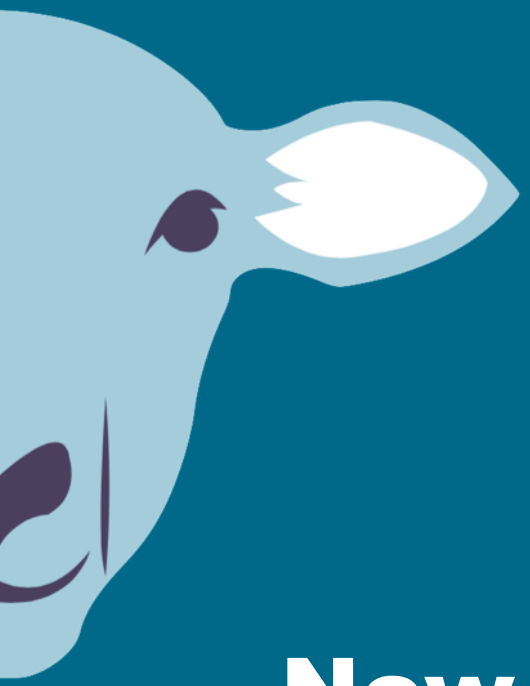


New Zealand Genetic Evaluation (NZGE)

Dr Sheryl-Anne Newman,
AgResearch

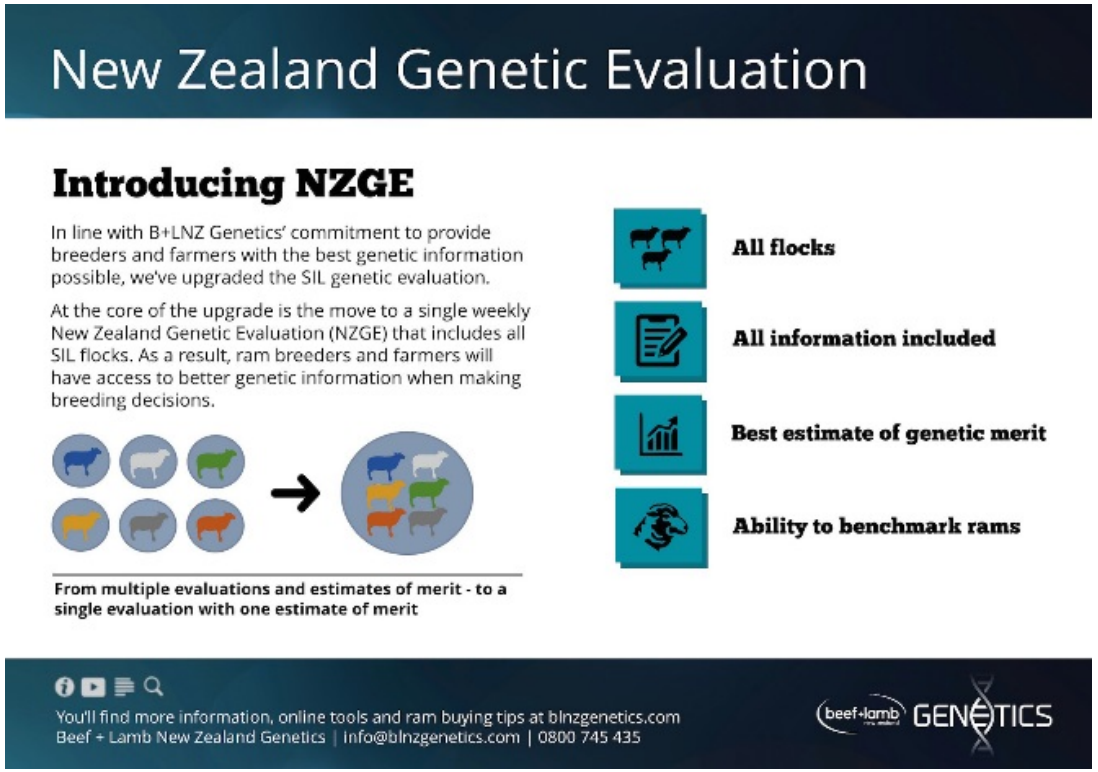
agresearch

- NZGE
  - Implementation
  - Common queries
  - Standard indexes

- Reporting by Connectedness

Vision – The evaluation

- To provide breeders and farmers with the best genetic information possible enabling better breeding decisions, more often.
  - All flocks
  - All information
  - Best indication of Genetic Merit
  - Better benchmarking



New Zealand national genetic evaluation (NZGE)

- Run weekly since 22 July 2017
- Starts 7pm Friday, completed by Sunday 8am

- 1160 active and reference flocks
- 8.7 million animals

Common queries

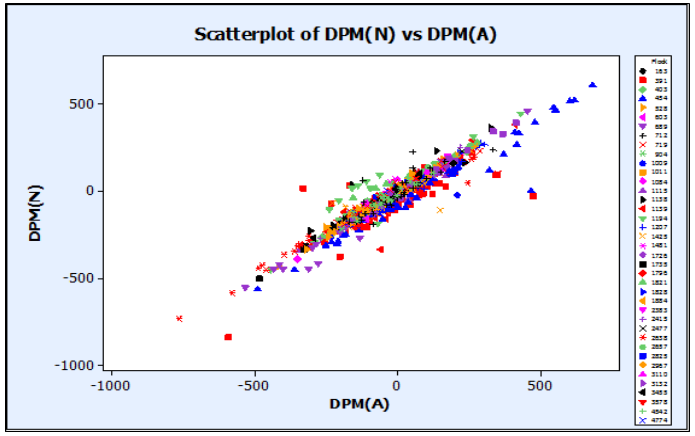
- Complexity of NZGE
- Change in values
- Re-ranking of animals
- Within flock breeding values
- NZGE vs National Genomic evaluations

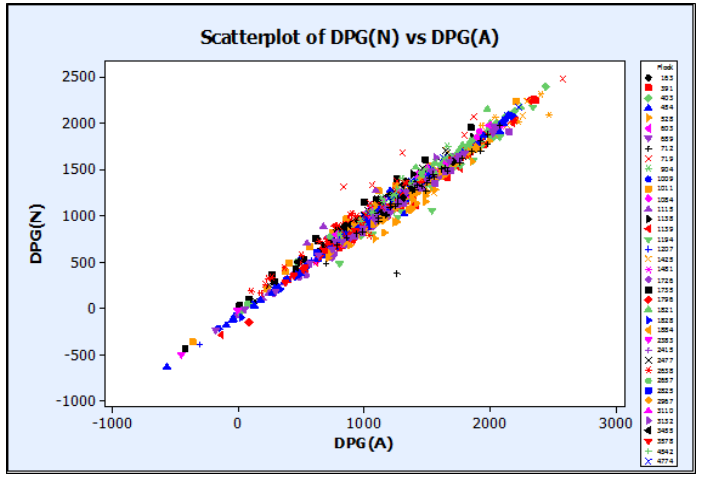
Complexity of NZGE ?

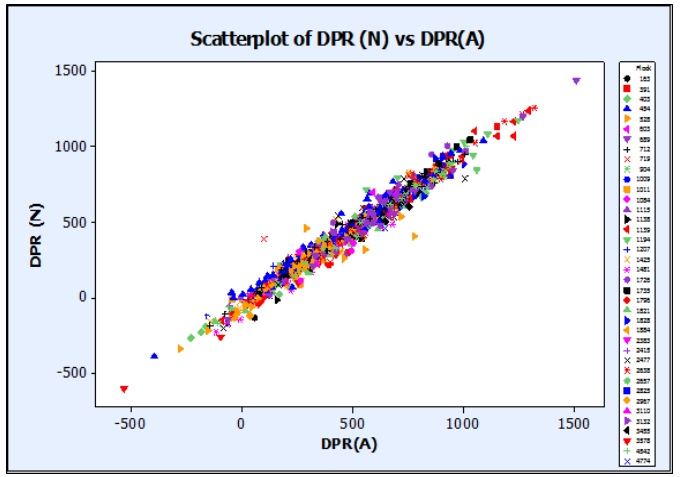
Analysis options

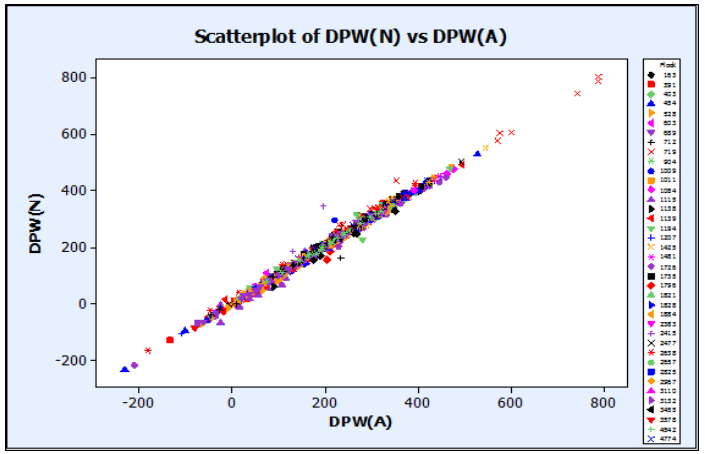
- number of flocks
- analysis year range
- goal trait groups
- inclusion of hogget reproduction data
- inclusion of pregnancy scanning information
- inclusion of CT or Viascan meat data

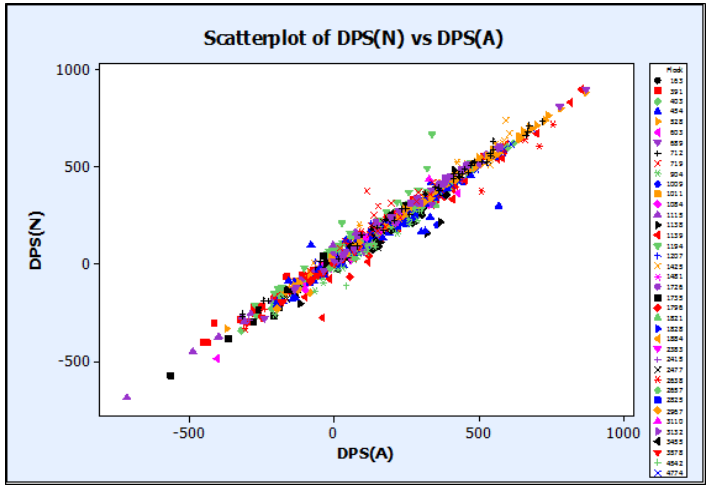
- NZGE analysis options are always the same

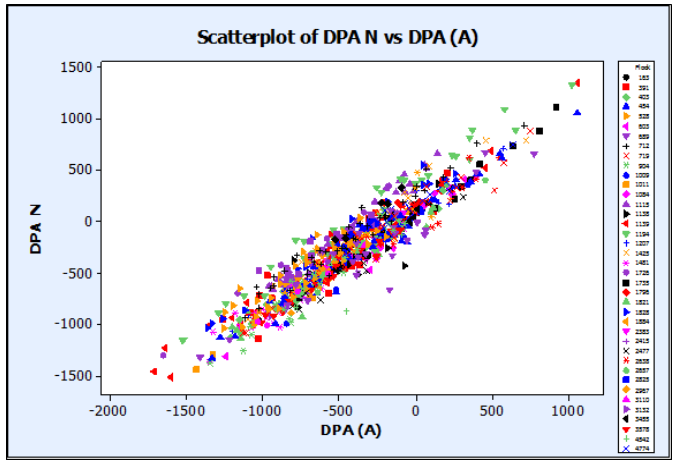

Scatterplot of DPM(N) vs DPM(A)
DPM(N)
DPM(A)

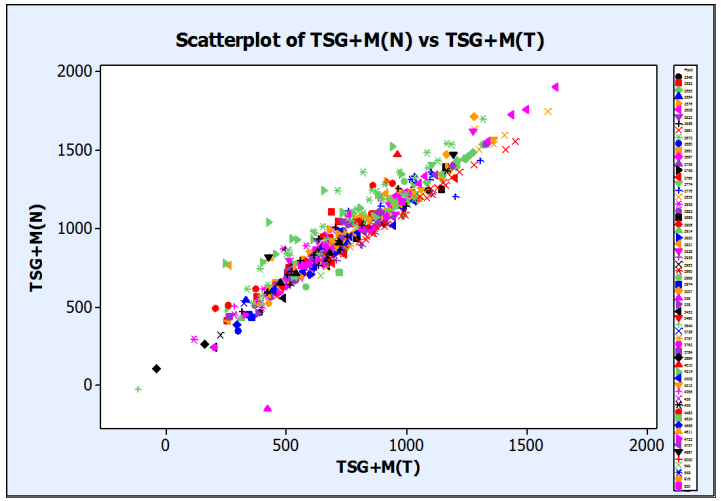

Scatterplot of DPG(N) vs DPG(A)
DPG(N)
DPG (A)

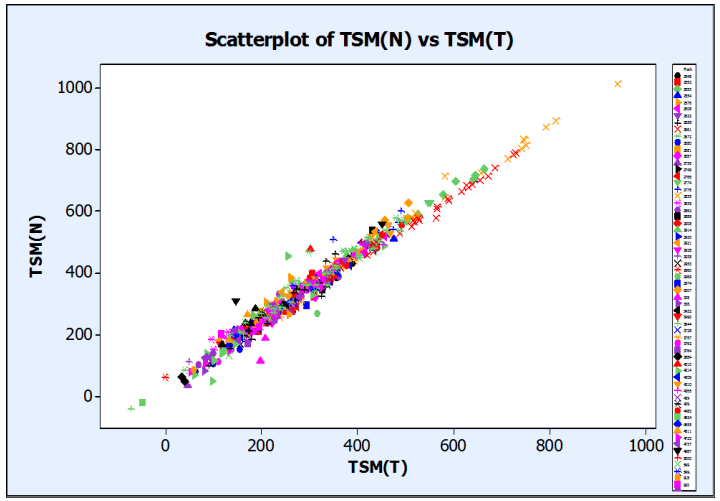

Scatterplot of DPR (N) vs DPR(A)
DPR (N)
DPR(A)

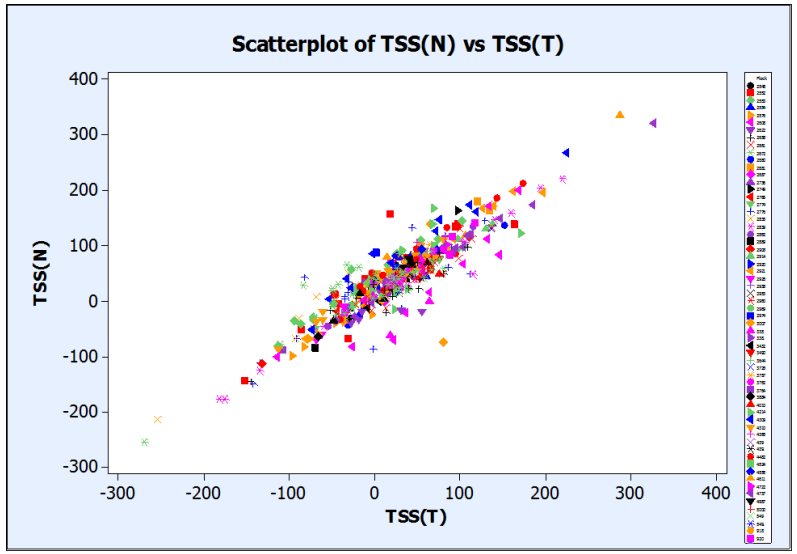

Scatterplot of DPW(N) vs DPW(A)
DPW(N)
DPW(A)

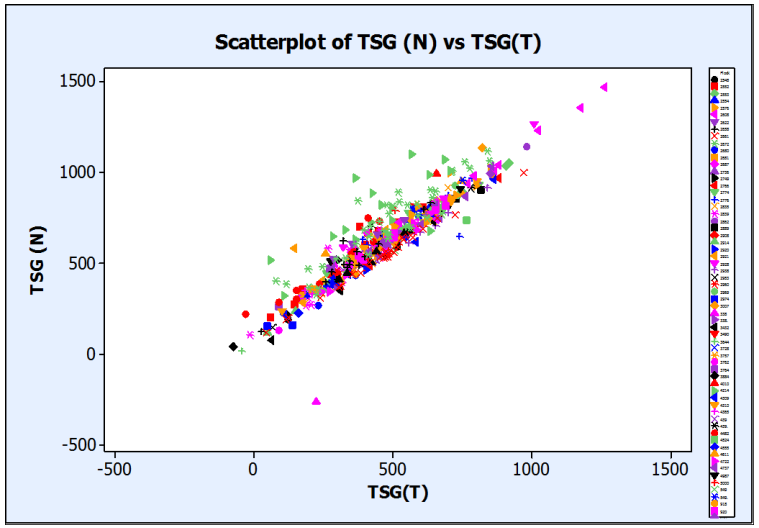

Scatterplot of DPS(N) vs DPS(A)
DPS(N)
DPS(A)

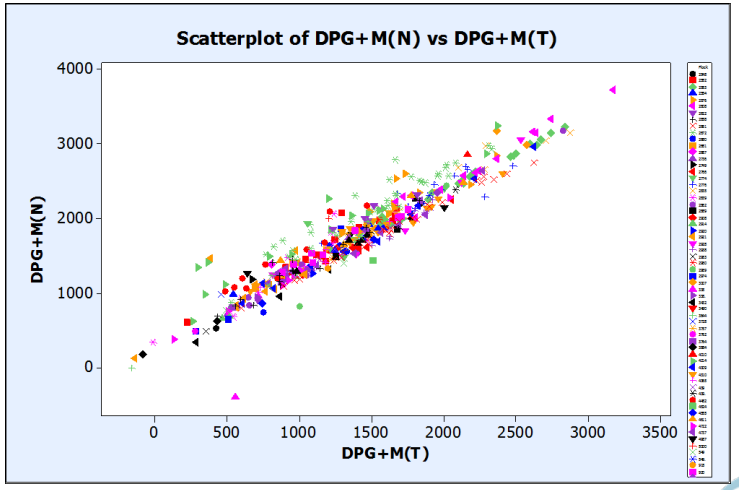

Scatterplot of DPA N vs DPA (A)
DPA N
DPA (A)

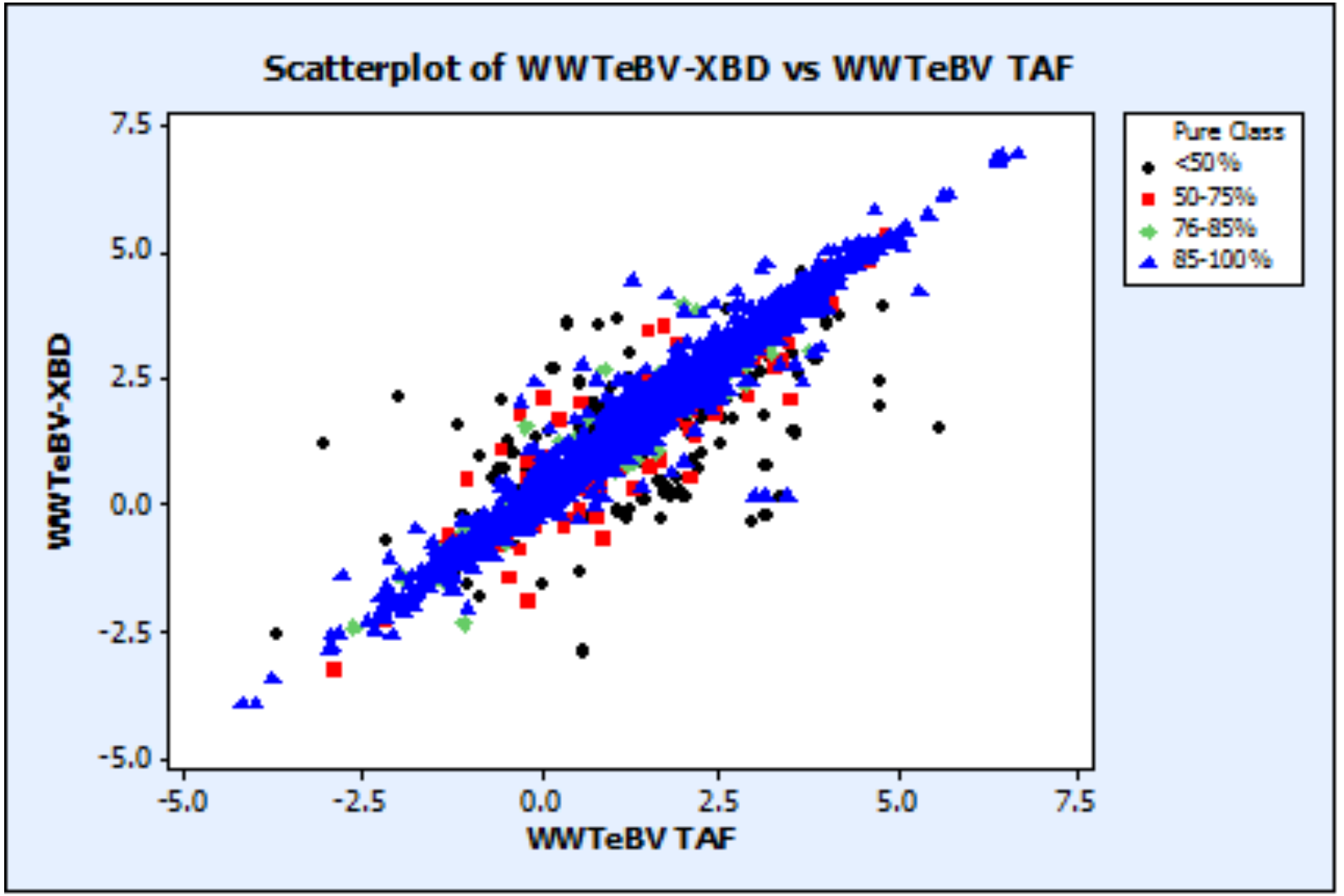

Scatterplot of TSG+M(N) vs TSG+M(T)
TSG+M(N)
TSG+M(T)
2000
1500
1000
500
0
0
500
1000
1500
2000

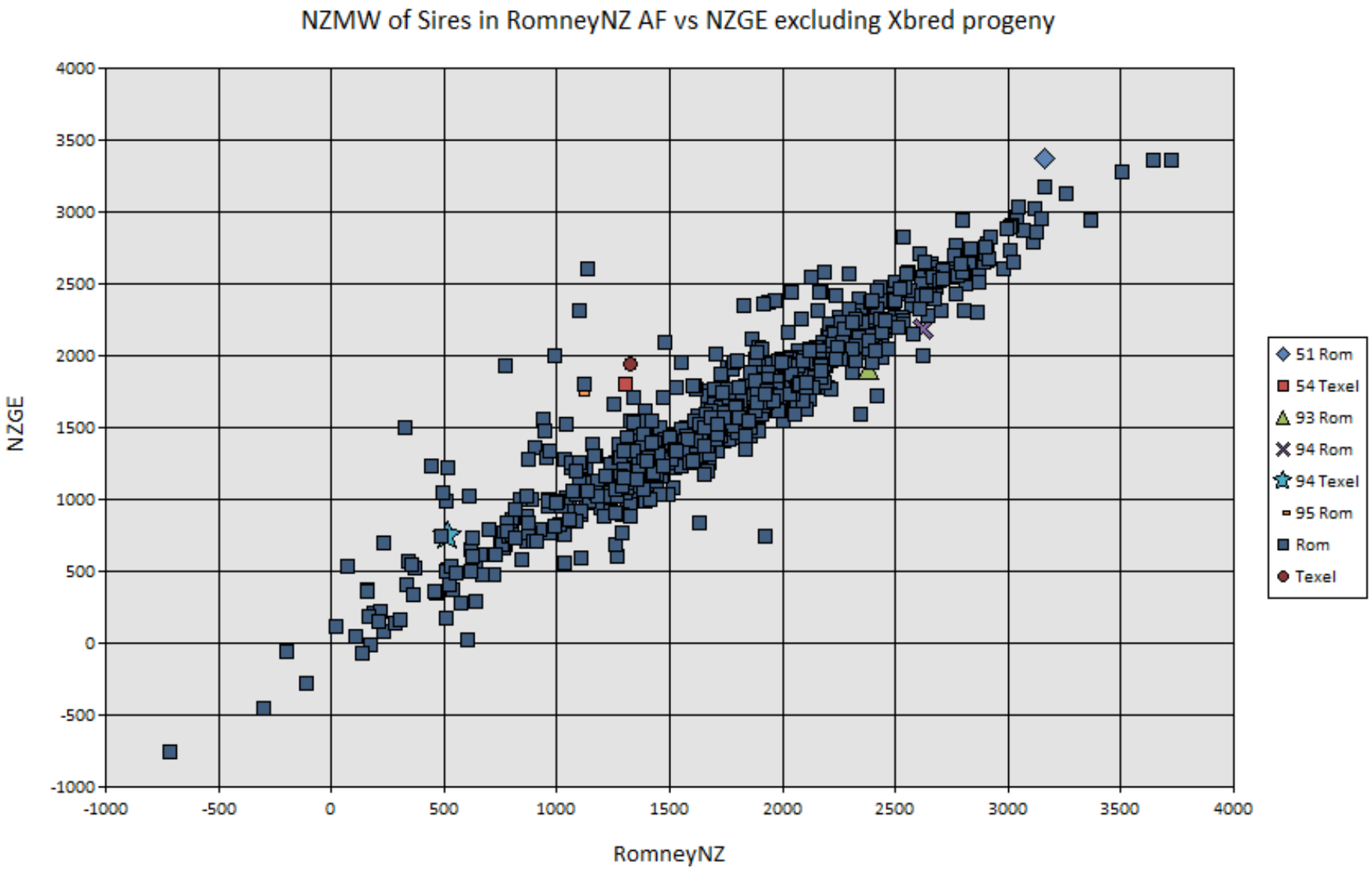

Scatterplot of TSM(N) vs TSM(T)
TSM(N)
TSM(T)
1000
800
600
400
200
0
0
200
400
600
800
1000


Scatterplot of TSS(N) vs TSS(T)
TSS(N)
TSS(T)
400
300
200
100
0
-100
-200
-300
-300
-200
-100
0
100
200
300
400

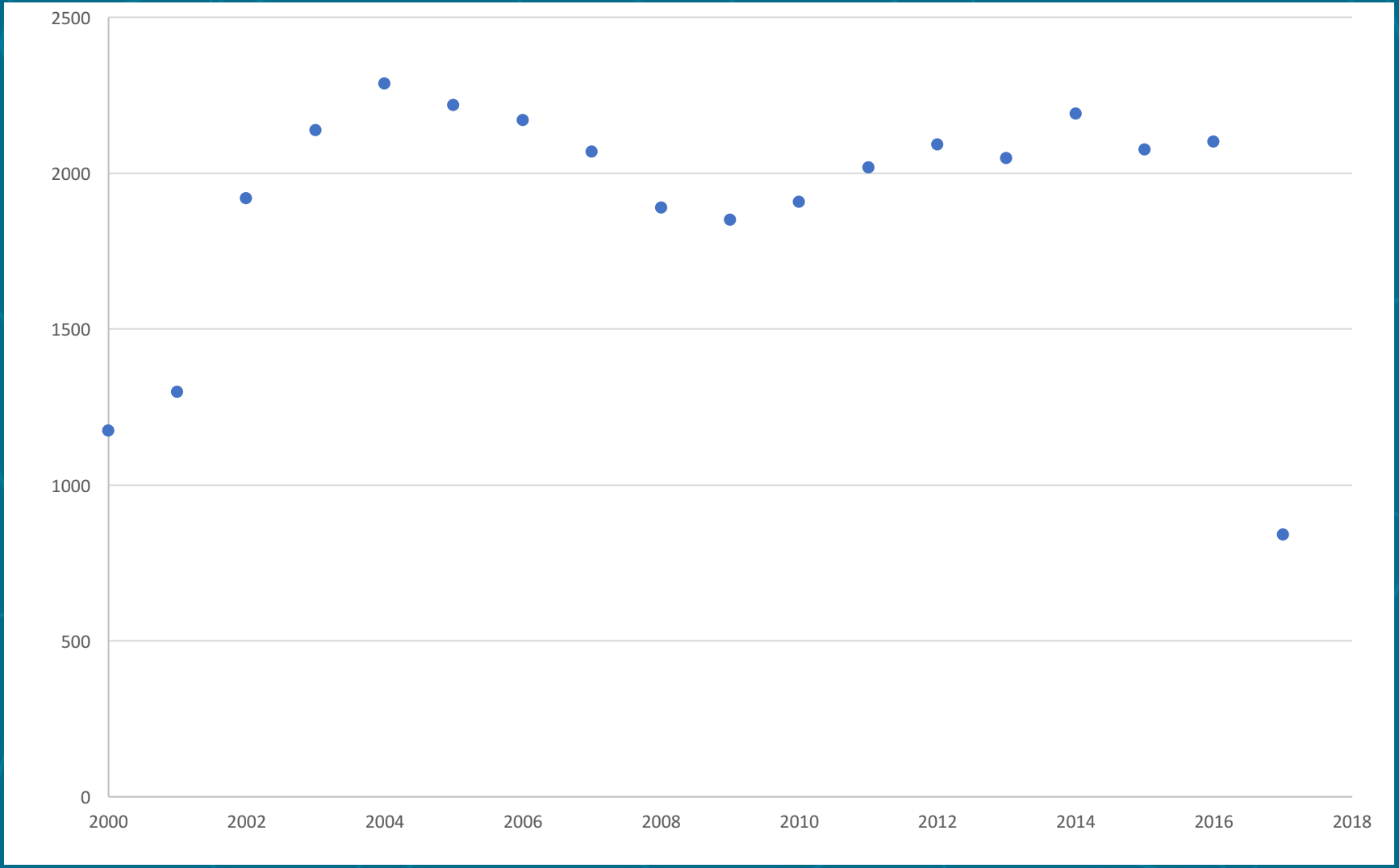

Scatterplot of TSG (N) vs TSG(T)
TSG (N)
TSG(T)
1500
1000
500
0
-500
-500
0
500
1000
1500


Scatterplot of DPG+M(N) vs DPG+M(T)
DPG+M(N)
DPG+M(T)
4000
3000
2000
1000
0
0
500
1000
1500
2000
2500
3000
3500


Scatterplot of WWTeBV-XBD vs WWTeBV TAF
WWTeBV-XBD
WWTeBV TAF
7.5
5.0
2.5
0.0
-2.5
-5.0
-5.0
-2.5
0.0
2.5
5.0
7.5
Pure Class
<50%
50-75%
76-85%
85-100%


NZMW of Sires in RomneyNZ AF vs NZGE excluding Xbred progeny
NZGE
RomneyNZ
4000
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1000
-500
0
500
1000
1500
2000
2500
3000
3500
4000
51 Rom
54 Texel
93 Rom
94 Rom
94 Texel
95 Rom
Rom
Texel

Number of evaluations run each year



Standard indexes

- Initial SIL indexes defined by goal trait groups used in the analysis
  - Dual Purpose Overall (DPO)
  - Dual Purpose Production (DPP) indexes
  - Terminal Sire Overall (TSO)
  - Terminal Sire Production (TSP)
  - Same name for indexes including different goal trait groups
    - growth, reproduction, survival, meat
    - growth, reproduction, survival, wool
    - growth, reproduction, wool, meat, WormFEC

Standard indexes

- NZGE has numerous goal trait groups and breeding values

Growth	Adult Size	Meat Yield	Lamb Survival
Wool	Fine Wool	Wool Quality	
Reproduction	Hogget Lambing	Twinning Rate	Stayability
WormFEC	Facial Eczema	Resilience	
Dag Score	Body Condition Score	Carla	Bare Points

Standard indexes

- New ‘standard’ indexes
  - NZ Standard Maternal Worth (NZMW)
    - includes Reproduction, Lamb Survival, Lamb Growth, Adult Size, Wool
  - NZ Standard Terminal Worth (NZTW)
    - includes Reproduction, Lamb Survival, Lamb Growth, Meat Yield

- Customised indexes are still available
  - SIL has some customised indexes already set up
    - Maternal Worth with Meat
    - Maternal Worth with WormFEC
    - Maternal Worth with Facial Eczema
    - Maternal Worth with Dag Score

Reporting by connectedness

- Purpose of across flock reports

Reporting by Connectedness

- Across flock evaluations generate breeding values for all animals
- If flocks are not connected then comparison of breeding values across those flocks is invalid
- Monitoring connectedness across a range of goal trait groups and indexes can be difficult

Reporting by Connectedness

- Across flock evaluations generate breeding values for all animals
- If flocks are not connected then comparison of breeding values across those flocks is invalid
- Monitoring connectedness across a range of goal trait groups and indexes can be difficult
- A simple tool for across flock reports that identifies valid comparisons
  - unconnected breeding values and indexes are not reported

NZ Standard Terminal Worth

3 year Sire Summary

o list (53 report Flocks)

Id	*NZTW	rank	*TSS	*TSG	*TSM
132/14	1543	*36*	-19	836	726
400/15	1542	*37*	63	537	941
1/15	1536	*38*	42	1012	482
301/10	1536	*38*	-22	949	609
20/14	1533	*40*	-41	1058	517
447/03	1527	*41*	1	1056	470
126/13	1523	*42*	65	1062	396
1230/15	1520	*43*	72	1399	48
114/14	1506	*44*	-11	980	537
64/13	1504	*45*	111	711	683
1391/15	1502	*46*	188	971	343
996/15	1499	*47*	-17	567	949
773/15	1496	*48*	17	913	567
76/13	1493	*49*	133	977	383
138/15	1491	*50*	48	1075	369
99/13	1485	*51*	34	876	575
182/14	1484	*52*	23	795	667
867/15	1483	*53*	51	787	645
14/13	1464	*54*	56	851	556
142/12	1453	*55*	183	832	437
353/15	1452	*56*	20	1152	280
1441/08	1447	*57*	195	894	357
562/13	1446	*58*	25	883	538

Example report for NZTW

Id	* NZTW	rank	* TSS	* TSG	* TSM
1910/14	**513**	*386*	177	252	84
77/12	**498**	*387*	-222	663	56
205/10	**492**	*388*	174	156	162
1658/13	**488**	*389*	116	284	88
950/10	**487**	*390*	-18	434	71
142/09	**477**	*391*	-70	260	287
1659/13	**471**	*392*	105	302	64
217/12	**453**	*393*	65	300	88
A5/11	**440**	*394*	102	129	209
1141/13	**398**	*395*	-40	236	202
93/11	**391**	*396*	153	214	24
1385/12	**367**	*397*	10	495	-138
1965/13	**365**	*398*	7	397	-39
594/12	**349**	*399*	-163	573	-61
298/13	**316**	*400*	34	297	-16
511/14	**250**	*401*	1	86	164
795/13	**233**	*402*	-81	280	35
77/09	**220**	*403*	121	391	-292
118/12	**17**	*404*	-8	9	16
37/11		*405*	-93	245	
698/15		*405*	37	932	
16/12		*405*	-36	503	
765/11		*405*	-7	540	
55/12		*405*			
A216/15		*405*	24	898	204
A60/14		*405*		428	222
110/12		*405*	0	609	
715/15		*405*	2	965	
25/13		*405*			
166/11		*405*			
40/09		*405*			
5037/15		*405*			
407/14		*405*			
368/13		*405*			
1048/11		*405*	10	711	

Example report for NZTW

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Example report for NZMW

Id	* NZMW	rank	* DPR	* DPS	DPG+A	rkDPG+A	* DPW
111/10		*474*		585	1566	36	
85/13		*474*		468	1471	55	
211/13		*474*		371	1467	57	
276/13		*474*	354	302	1462	60	
34/14		*474*	359	-28	1278	123	
263/15		*474*	408	368	1254	131	
273/13		*474*			1250	135	284
121/15		*474*	211	422	1250	135	
1008/15		*474*	509	77	1199	153	
115/14		*474*	76	-54	1199	153	
279/13		*474*			1160	171	354
28/14		*474*	364	152	1156	173	
108/12		*474*	692	-108	1154	174	
219/15		*474*	312	127	1149	178	
R41/14		*474*	287	207	1114	187	
347/15		*474*	433	194	1105	192	
53/15		*474*	317	256	1093	201	
258/15		*474*			1071	212	477
195/13		*474*	127	213	1064	215	
138/15		*474*	303	198	1063	216	
13/15		*474*	352	71	1055	220	343
31/09		*474*	-52	-92	1040	229	
333/13		*474*			1004	245	298
35/13		*474*	592	29	998	252	
14/13		*474*			991	260	298
A26/14		*474*	-73	44	989	262	
1341/14		*474*	369	-93	987	264	
1299/15		*474*		205	975	268	286
1020/11		*474*	610	-66	973	270	
23/14		*474*	272	445	960	274	
14/15		*474*	352	9	952	277	
177/15		*474*	379	232	952	277	
385/12		*474*			945	281	246
74/13		*474*	514	69	945	281	

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Impact of reporting by connectedness

- Group1 - 53 terminal sire flocks

Id	RbC* NZTW	* NZTW	acc%	rank
56/14	2088	2088	69	1
650/15	2012	2012	66	2
S32/15	1998	1998	62	3
17/14	1846	1846	64	4
680/13	1834	1834	86	5
14/14	1813	1813	74	6
299/14	1772	1772	70	7
401/13	1770	1770	87	8
271/12	1750	1750	90	9
37/14	1723	1723	75	10
57/12	1698	1698	81	11
609/14	1692	1692	67	12
2326/14	1685	1685	78	13
657/15	1663	1663	66	14
118/14	1657	1657	87	15
485/15	1642	1642	60	16
457/14	1642	1642	78	16
60/15	1632	1632	66	18
116/10	1626	1626	87	19
603/15	1625	1625	63	20
137/14	1621	1621	76	21
213/14	1617	1617	67	22
296/05	1610	1610	96	23
25/13	1602	1602	76	24
471/15	1601	1601	64	25
279/13	1586	1586	82	26
334/15	1582	1582	64	27
147/14	1572	1572	73	28
223/14	1571	1571	76	29
730/15		1565	60	30
371/13	1559	1559	82	31
197/14	1557	1557	69	32
281/13	1550	1550	75	33
299/13	1547	1547	77	34
12520/13	1546	1546	80	35
1198/14	1545	1545	65	36
132/14	1543	1543	71	37
400/15	1542	1542	64	38
301/10	1536	1536	94	39
1/15	1536	1536	67	39
20/14	1533	1533	78	41

Id	RbC* NZTW	* NZTW	acc%	rank
1198/14	1545	1545	65	36
132/14	1543	1543	71	37
400/15	1542	1542	64	38
301/10	1536	1536	94	39
1/15	1536	1536	67	39
20/14	1533	1533	78	41
447/03	1527	1527	96	42
126/13	1523	1523	78	43
1230/15	1520	1520	62	44
114/14	1506	1506	67	45
64/13	1504	1504	73	46
4/14		1504	61	46
1391/15	1502	1502	61	48
996/15	1499	1499	65	49
773/15	1496	1496	68	50
76/13	1493	1493	72	51
138/15	1491	1491	61	52
99/13	1485	1485	78	53
182/14	1484	1484	67	54
867/15	1483	1483	66	55
14/13	1464	1464	77	56
142/12	1453	1453	88	57
353/15	1452	1452	64	58
1441/08	1447	1447	91	59
562/13	1446	1446	80	60
218/15	1445	1445	66	61
932/15	1443	1443	64	62
44/12	1441	1441	81	63
2673/14	1440	1440	68	64
393/15	1439	1439	54	65
857/11	1437	1437	95	66
433/15	1435	1435	63	67
263/12	1433	1433	88	68
4/10	1430	1430	96	69
2235/13	1426	1426	75	70
662/11	1423	1423	81	71
112/14	1421	1421	81	72
87/13	1417	1417	74	73
80/13	1415	1415	72	74
518/09	1409	1409	86	75
254/13	1408	1408	81	76

Id	RbC* NZTW	* NZTW	acc%	rank
66/08	1406	1406	93	77
927/12	1400	1400	78	78
2423/15	1399	1399	61	79
TB126/08	1399	1399	92	79
12/15	1399	1399	71	79
S500/14	1398	1398	61	82
17/10	1396	1396	81	83
480/15	1393	1393	61	84
18/13	1390	1390	75	85
258/11	1390	1390	94	85
403/13	1373	1373	78	87
1587/14		1370	68	88
388/12	1357	1357	91	89
23/12		1357	70	89
A26/14	1356	1356	75	91
T61/15	1355	1355	66	92
1075/13	1348	1348	87	93
2244/14	1346	1346	75	94
20/12	1345	1345	76	95
74/11	1344	1344	89	96
3093/15	1343	1343	59	97
26/14	1337	1337	69	98
523/12	1335	1335	85	99
193/10	1335	1335	89	99
715/15		1334	60	101
770/14	1333	1333	80	102
21/12	1332	1332	83	103
52/14	1332	1332	67	103
698/15		1332	60	103
37/15	1330	1330	54	106
2011/10	1330	1330	85	106
681/11	1324	1324	86	108
2072/11	1321	1321	80	109
A177/12	1318	1318	81	110
158/13	1311	1311	74	111
323/14	1309	1309	79	112
68/14	1305	1305	67	113
839/15	1303	1303	64	114
88/14	1300	1300	72	115
C571/12	1298	1298	84	116
51/11	1298	1298	92	116

Id	RbC* NZTW	* NZTW	acc%	rank
A43/09	761	761	85	405
560/11	758	758	78	406
526/13		755	73	407
44/15		755	51	407
466/11	752	752	77	409
2517/15	752	752	56	409
809/15	747	747	47	411
452/14	744	744	85	412
4134/13	744	744	76	412
194/09		741	79	414
2051/10	738	738	85	415
1013/15	736	736	63	416
A60/14		735	59	417
91/15	733	733	54	418
20034/13	722	722	71	419
124/12		722	80	419
7/12		722	82	419
192/14	720	720	74	422
106/07	713	713	85	423
136/11	706	706	79	424
502/12		705	63	425
407/14		704	56	426
1865/15	703	703	57	427
404/11	703	703	81	427
21/13	702	702	58	429
2398/15	697	697	57	430
1190/10		697	76	430
204/14		695	63	432
1521/14		695	66	432
656/12	692	692	59	434
408/11	691	691	82	435
4038/14	688	688	76	436
4232/14	688	688	74	436
111/14	685	685	51	438
28/14	684	684	66	439
3001/12	678	678	83	440
1837/12	670	670	81	441
441/11	668	668	65	442
120/12		666	71	443
A407/08	661	661	87	444
137/14		657	63	445

Id	RbC* NZTW	* NZTW	acc%	rank
98/10	649	649	81	446
56/14	648	648	56	447
2004/11	644	644	79	448
110/12		637	83	449
210/12	635	635	69	450
709/11	632	632	61	451
14/11		632	76	451
664/10	629	629	90	453
25/13		628	52	454
139/14	626	626	49	455
1262/13	623	623	67	456
80/12		617	78	457
69/13	614	614	79	458
132/10	613	613	70	459
1873/13	609	609	77	460
191/09		609	83	460
1048/11		606	87	462
11/12	604	604	78	463
40/09		599	79	464
66/10	596	596	89	465
219/10		595	89	466
189/10	590	590	77	467
3/10	589	589	83	468
2161/14	582	582	73	469
1479/11	580	580	66	470
2481/14	573	573	76	471
46/13	565	565	85	472
2099/12		558	66	473
35/13		558	78	473
386/11	551	551	84	475
559/12		544	68	476
2097/13	541	541	61	477
161/15		541	66	477
2/13	533	533	75	479
9853/13	532	532	59	480
27/12	529	529	80	481
1434/10		525	80	482
1910/14	513	513	64	483
77/12	498	498	84	484
205/10	492	492	83	485
1658/13	488	488	68	486

Id	RbC* NZTW	* NZTW	acc%	rank
950/10	487	487	79	487
142/09	477	477	87	488
1659/13	471	471	69	489
S283/12		458	59	490
217/12	453	453	70	491
55/12		446	75	492
A5/11	440	440	79	493
294/12		438	68	494
216/14		434	83	495
1141/13	398	398	74	496
93/11	391	391	80	497
S1190/10		387	31	498
1385/12	367	367	63	499
1965/13	365	365	73	500
594/12	349	349	76	501
298/13	316	316	82	502
137/11		266	52	503
511/14	250	250	52	504
795/13	233	233	83	505
77/09	220	220	92	506
25/11		216	76	507
TG436/14		166	30	508
3/12		157	45	509
37/11		136	83	510
95/11		127	74	511
5/13		91	57	512
166/11		81	18	513
6/12		77	42	514
118/12	17	17	74	515

Impact of reporting by connectedness

- 3 year sire summary

- Group1 - 53 terminal sire flocks
  - 515 sires, 405 connected, 110 dropped – 23 dropped from top half

Impact of reporting by connectedness

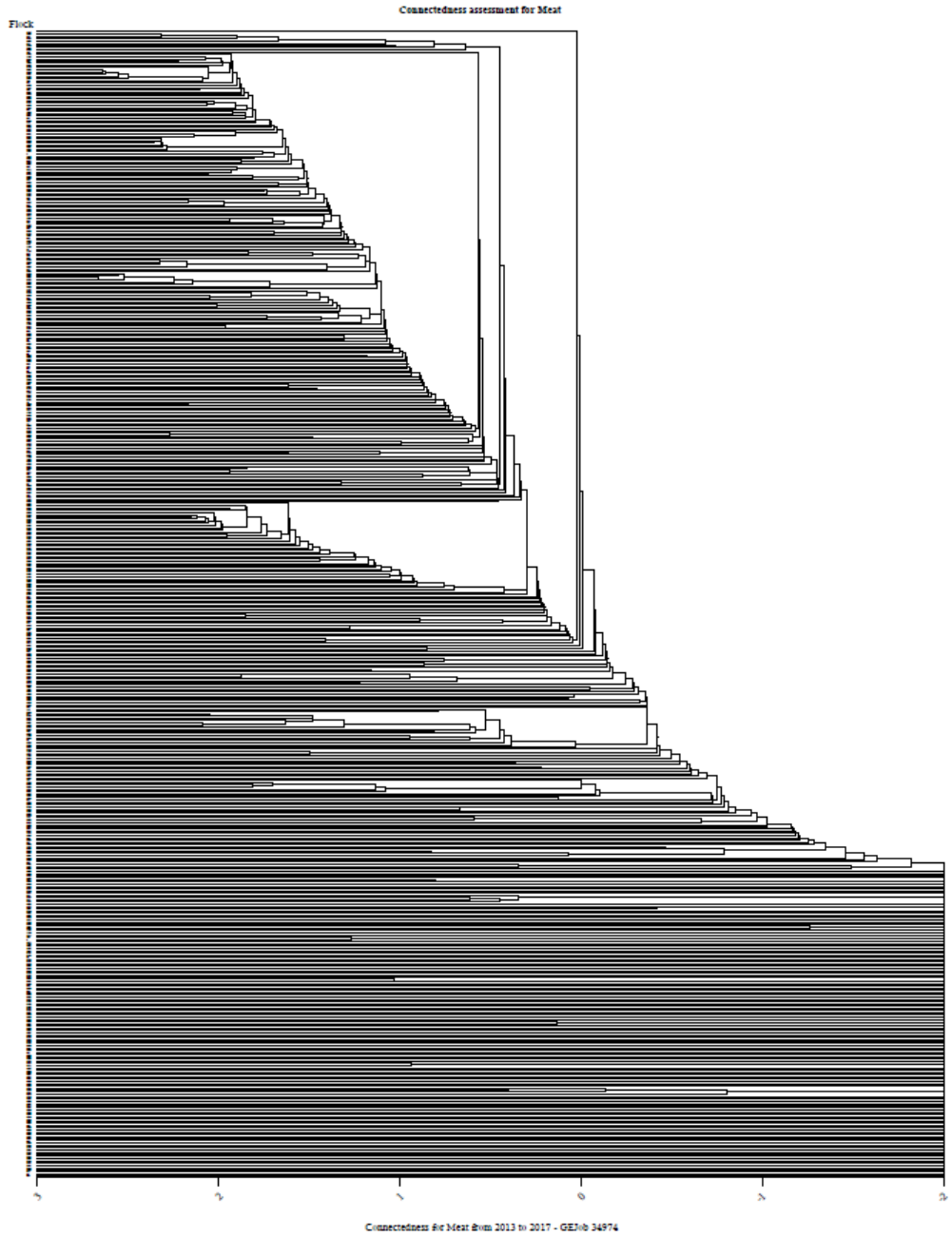
- Group1 - 53 terminal sire flocks
  - 515 sires, 405 connected, 110 dropped – 23 dropped from top half
- Group 2 - 6 terminal sire flocks
  - 53 sires, 34 connected, 19 dropped – 1 from top half

Id	RbC* NZTW	* NZTW	acc%	rank	*
181/12	2047	2047	88	1	
136/14	1734	1734	60	2	
135/14	1732	1732	79	3	
159/14	1720	1720	59	4	
468/14	1698	1698	73	5	
438/14	1678	1678	76	6	
59/13	1667	1667	83	7	
75/15	1620	1620	63	8	
100/15	1610	1610	62	9	
84/14	1590	1590	71	10	
641/13	1579	1579	75	11	
122/13	1468	1468	71	12	
8/13	1435	1435	70	13	
81/11	1417	1417	80	14	
112/14	1415	1415	62	15	
96/14	1414	1414	54	16	
40/12	1387	1387	76	17	
6/09	1379	1379	90	18	
18/13	1356	1356	81	19	
140/11	1298	1298	88	20	
450/12	1291	1291	79	21	
76/14	1288	1288	68	22	
90/14		1286	68	23	
513/12	1260	1260	75	24	
26/15	1243	1243	58	25	
110/13	1233	1233	65	26	
487/12	1211	1211	73	27	

Id	RbC* NZTW	* NZTW	acc%	rank	*
276/12	1206	1206	77	28	
99/13		1190	76	29	
24/14	1157	1157	70	30	
291/12		1152	78	31	
567/11	1116	1116	77	32	
93/12	1111	1111	76	33	
131/13		1102	68	34	
144/13	998	998	72	35	
41/11		973	82	36	
202/13		928	70	37	
135/12		882	68	38	
129/14		854	55	39	
85/13		844	72	40	
66/13		824	69	41	
16/13		812	70	42	
134/10	798	798	62	43	
271/09		778	69	44	
329/11		775	53	45	
301/12		728	67	46	
275/14		706	53	47	
14/13	665	665	71	48	
18/14		651	63	49	
158/13	626	626	54	50	
107/11		621	74	51	
287/12		528	75	52	
256/12		425	61	53	

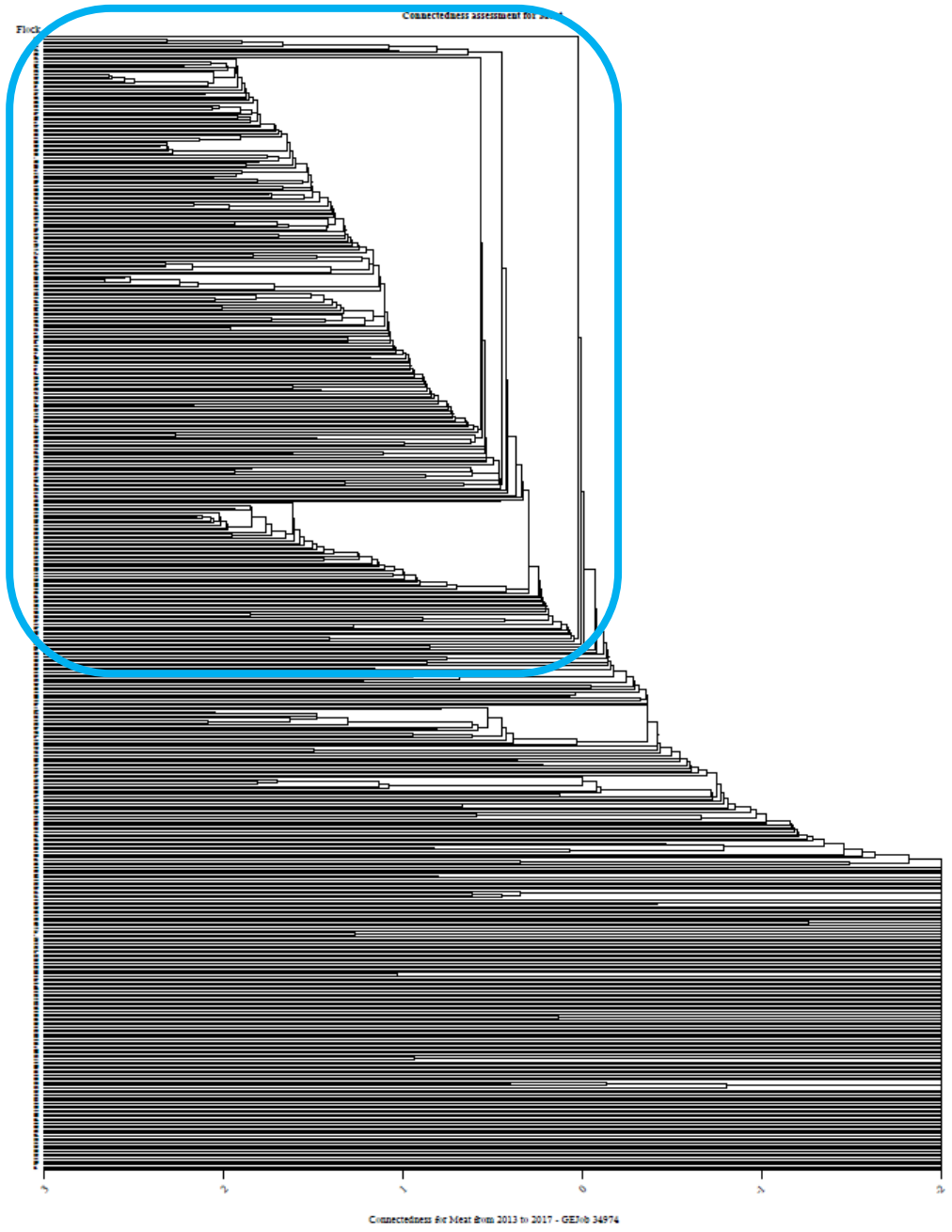
Impact of reporting by connectedness

- Group1 - 53 terminal sire flocks
  - 515 sires, 405 connected, 110 dropped – 23 dropped from top half
- Group 2 - 6 terminal sire flocks
  - 53 sires, 34 connected, 19 dropped – 1 from top half
- Group 3 – 38 dual purpose flocks
  - 564 sires, 473 connected, 91 dropped – 38 from top half

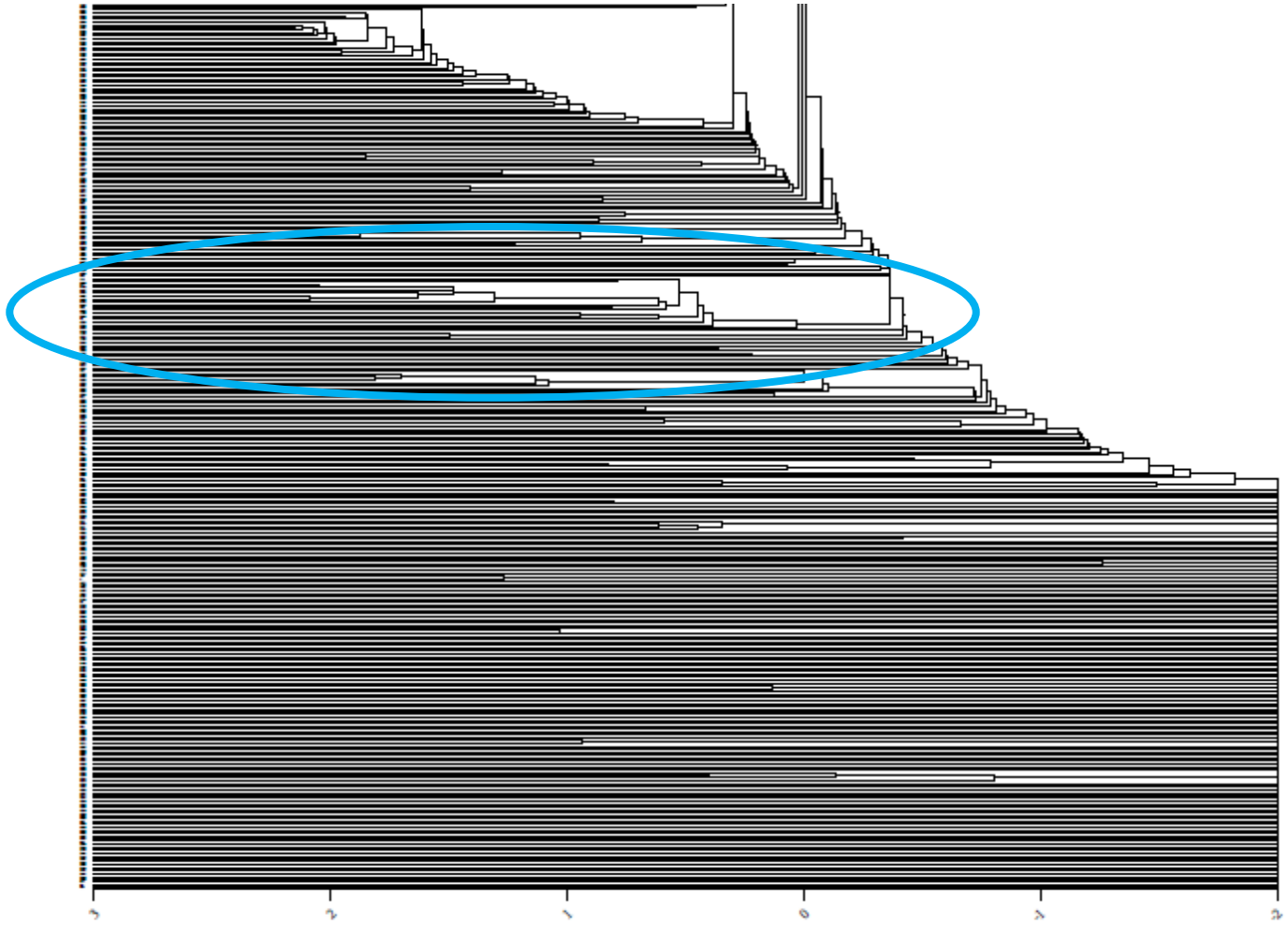


beef+lamb GENETICS | SHEEP BREEDER FORUM

Reprodn		Survival		Growth		AdultSize		Meat		Wool		Worm		FEczema		Dag
3		3		3		2		2		2		x		0		x
x		3		3		x		0		0		x		x		x
2		3		3		x		1	☹	2		x		x		x
3		3		3		2		1	☹	2		x		x		x
3		2		2		x		2		x		x		x		x
3	😐	0		2		0		0		1		x		x		x
2	😐	1		3		0		x		0		x		0		x
3		3		3		2		2		3		3		0		x
3		2		2		x		2		x		x		x		x
0		0		0		x		x		0		x		x		x



beef+lamb GENETICS | SHEEP BREEDER FORUM



Connectedness for Meat from 2013 to 2017 - GEJob 34974

beef+lamb GENETICS | SHEEP BREEDER FORUM

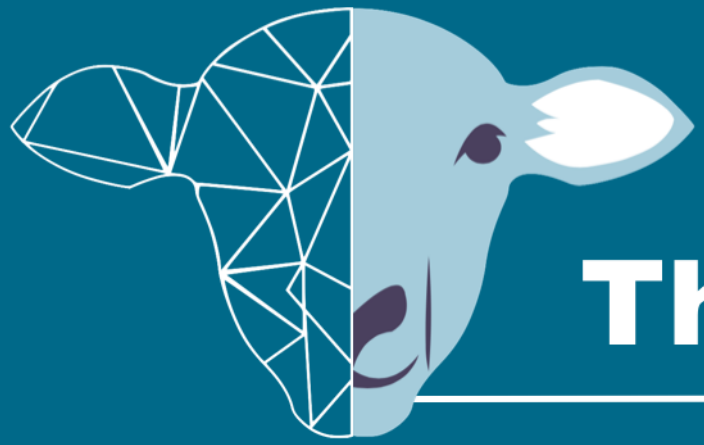
Next development

- Traffic light tables/reports

  to show connectedness between selected flocks

Reporting by Connectedness

- highlights where flocks are not connected for a goal trait group, so on across flock reports indexes and breeding values should not be compared



Thank you.