Final report

Survey of Australian goat producers' use of KIDPLAN

Project code:	P.PSH.2137
Prepared by: Olarte Mantilla	Professor Louwrens Hoffman, Professor Daniel Cozzolino, Dr Sandra
	The University of Queensland
Date published:	xx 2022

Abstract

The two questionnaires developed to determine the goat industry's use of and perception of KIDPLAN indicate that both Seedstock and commercial producers requested changes to KIDPLAN that ranged from easier access to a revisit and re-calculation of estimated breeding values (EBVs) and selection indexes, respectively. Non-KIDPLAN seedstock producers' users noted an inadequate interphase between KIDPLAN and breeding societies for the importation of their data from the later. If this was improved, more seedstock producers would use KIDPLAN thereby increasing the number of data points and thus addressing another highlighted shortcoming – insufficient animals in KIDPLAN. The majority of the respondents indicated that the goat industry should have their own link on the MLA web-page. There was a request from commercial producers for MLA to supply more information on genetics in goats as well as management – the latter ranged from selection of replacement breeding goats to kid survivability, including whether pedigree animals were in fact more superior (fit for purpose) than rangeland goats under the harsher environmental conditions. A major shortcoming was the lack of medicines for goat diseases; most medications being applied were off-label. New entrants requested more information on a broad range of topics that included suitable infrastructure to how to use EBVs.

1 Executive summary

Background

The project evaluated the understanding of, and impediments to the use of KIDPLAN amongst seedstock breeders and producers of goats in Australia. Information was collected from breeders and producers via a questionnaire. The answers provided will allow MLA to revisit and refine their strategy around the implementation of and further development of KIDPLAN.

Objectives

This research aimed to:

I.   Identify the barriers that prevent the use of KIDPLAN among Australian goat producers and seedstock breeders.
II. To identify potential needs that the Australian goat industry might have that could be addressed by MLA.

Methodology

- Two online questionnaires were developed for the goat industry: one designed for KIDPLN registered users and the second aimed at seedstock producers who did not use KIDPLAN and commercial producers.
- Various platforms, social media and MLA webpage/electronic newsletters, and attendance and presentation at various goat field days were used to recruit participants.
- The University of Queensland's Qualtrics system was used to develop the questionnaires and analyse the responses.

Results/key findings

- The major response was that KIDPLAN needs to be more goat focused and Estimated Breeding Values (EBVs) and indexes based on commercial production parameters needs to be developed.
- Goats should have a more prominent landing page/focus by MLA.
- An interphase that allows goat breeding societies' data to be imported effortlessly into KIDPLAN needs to be developed.
- Producers indicate that they would appreciate more information (via webinars, farmers' days, etc) around goat genetics and production management practices (e.g., to increase kid survivability).
- More information around suitable goat medication be provided.

Benefits to industry

- If implemented, goats will gain more prominence within MLA.
- KIDPLAN will become of more value to both the seedstock producers and their clients.
- More science-based information will be passed onto producers.

Future research and recommendations

- This study highlighted the shortcomings of KIDPLAN – core to these were that the EBVs and indexes be re-visited/calculated and that they be more goat orientated.
- That scientific proof be provided that showed which breed and crosses were superior or not.
- That research focused on on-farm kid survivability be conducted.
- That research around medication for goats be conducted.
- More informative material be produced for goat producers.

Table of contents

1. Background

The goat industry in Australia is largely based on rangeland goats derived from a diverse range of genotypes that have self-selected for survival under extreme conditions. A small but increasing seedstock industry has focused on the introduction of 'meat' breeds to increase growth rates and carcass yields, either within pure or cross breeding programs. These genetic improvement programs have largely been ad hoc and undocumented but have resulted in the development of genetic selection tools (KIDPLAN) using data collected from Boer goat producers. Despite the benefits of genetic improvement programs in the red meat animals, uptake of such programs remains low in the goat industry in Australia and there is a need to understand why and to demonstrate the potential gains in productivity and profitability from the implementation of a goat genetic improvement program.

The project will evaluate the understanding of, and impediments to the use of KIDPLAN amongst breeders and producers of goats in Australia. Information will be collected from breeders and producers via a questionnaire. The answers provided will allow MLA to revisit and refine their strategy around the implementation of and further development of KIDPLAN.

2. Objectives

There were three main objectives:
1. To conducted a survey of goat producers (minimum of 50) across the key goat producing regions of Australia. The producers surveyed will include a mixture of;
   a. Producers submitting data to KIDPLAN currently
   b. Producers purchasing animals with EBV's
   c. Stud producers
   d. Commercial producers
   e. Semi-managed and managed rangeland producers

   This objective was compiled of two questionnaires, the first was designed for KIDPLAN users (Appendix 1), and the second for both Seedstock and Commercial producers (Appendix 2). These objectives were met with seven KIDPLAN users and 49 Commercial and/or Seedstock breeders responding.

2. Presented the findings of the survey, via an online webinar and workshop, to members of the GIRDAC Committee. Key findings were shared with the GIRDAC Committee on the 8th of June 2022.

3. Submitted a comprehensive final report to MLA detailing outcomes of the survey and providing recommendations for the further development of KIDPLAN. The present document.

3. Methodology

3.1 Development of Questionnaires

The two Questionnaires were developed on the University of Queensland's Qualtrics system by the two principal investigators, the UQ Post doctorate, a prominent Seedstock producer who is also a KIDPLAN user, a representative from AgForce, a Research Officer Quantitative Genetics, NSW Department of Primary Industries (Agriculture NSW) and the MLA's Program Manager - Sheep and

Goat Productivity. When the questionnaires had been developed, members of the MLA Sheep Genetics team and a KIDPLAN user and a commercial breeder tested the system and gave inputs for further refinement.

Ethical approval for the questionnaires was submitted and approved by the UQ Human ethics committee of The University of Queensland and the National Statement on Ethical Conduct in Human Research with approval number 2022/HE000217.

3.2 Distribution of Questionnaires

Various platforms were used to sensitise and recruit participants and include advertising through various MLA media outlets, on social media platforms, by team members attending in-person goat-field days, -workshops and -auctions. The questionnaires' links with a brief background to the questionnaire, were shared on Facebook (BGA-Boer Group Australia, BGAA -Boer Group Breeders' Association Australia) – although both these Facebook groups have substantial members, better responses were received when a few selected seedstock and commercial producers were approached and sent the questionnaires out to their followers. The survey was also promoted by UQ and MLA at field days i.e. Collie, Bourke, Springsure. The questionnaires were also promoted in the MLA electronic media. Better responses were also received when the CI contacted individuals. Some KIDPLAN users were also phoned to request that they respond to the Questionnaire. The Chief Investigator also gave two talks and one Webinar (https://www.youtube.com/watch?v=E4CK9StbBmo) on KIDPLAN's uses and preliminary results of the questionnaire and during these presentations, requested additional respondents. The major success was achieved by utilisation of a number of goat seedstock producers' and commercial producers' networks where they personally requested their followers to respond to the Questionnaire.

3.3 General remarks

The number of respondents to both questionnaires were disappointing low (Table 1) – particularly as the questionnaires were designed to be filled in via desk-top computer or cell phone. Even though the questionnaire was short (10-15 mins to answer all questions), there were at least 17 Seedstock producers (KIDPLAN users) who had started filling in the questionnaire and for some reason did not complete the questionnaire. For the Commercial producers, an additional 25 producers started filling in the questionnaire but did not complete the questionnaire – of the producers who started filling in the questionnaire, 49 provided their post code (Figure 1). Of the 25 producers who did not complete the questionnaire, 11 provided some data which could be included into the data analyses.

Table 1: A breakdown of the Seedstock and commercial producers who responded to the Questionnaires on their utilisation and knowledge of KIDPLAN.

States	Seedstock breeders survey	Commercial producers survey
	7 completed survey	49 completed survey
ACT		
NSW	1	16
NT		
QLD	2	16
SA	1	7
TAS		
VIC	1	5
WA		5

Figure 1: An indication of the regions from where the respondents farm with goats
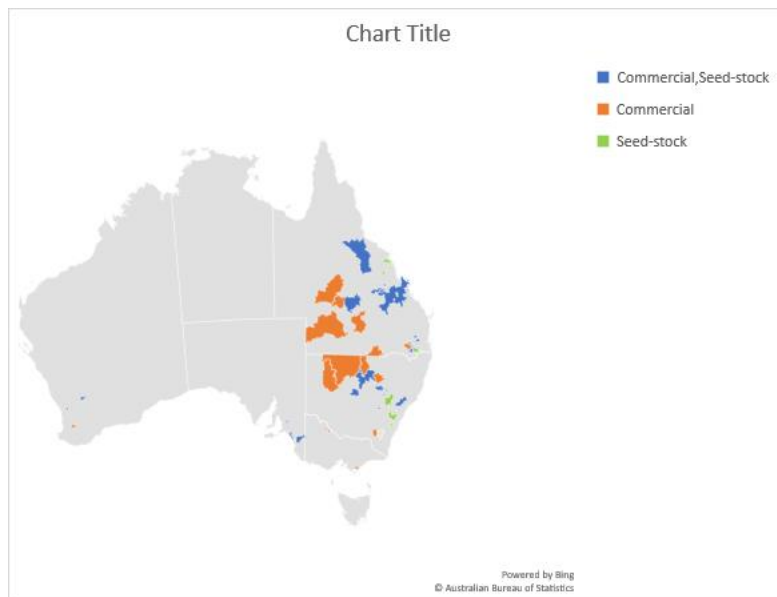
In hindsight, it might have been better to have only one questionnaire with a section in this questionnaire that was only applicable to KIDPLAN users for the following reasons:

    a. A number of the KIDPLAN users were also commercial breeders.

    b.   There were a few respondents who had started filling in the KIDPLAN focused questionnaire, only to notice that they had responded to the wrong questionnaire and thus had to redo the Questionnaire.

4 Results

The results are best understood by following the questions in the questionnaires (Appendix 1 & 2), where reasonable, the gist of the question posed can be read off the title of either the applicable Figure or Table.

4.1 KIDPLAN User

4.1.1 Seedstock Animals

Provide detailed information on all key findings/results that were identified during the project. Include all intellectual property materials as defined in the Agreement. This includes, but is not limited to; statistical analysis, tables, graphs, figures etc. generated throughout the project.

Seventeen respondents who used KIDPLAN attempted to answer the questionnaire, although only seven respondents gave full answers, five also had commercial herds (Q 4). One of the respondents had 3,000 and another 4,000 goats (Fig. 2). One respondent bred Angora goats and mentioned that it was difficult to get data on production indicators.

Figure 2: Indication of seedstock producer's (n=16) herd size.
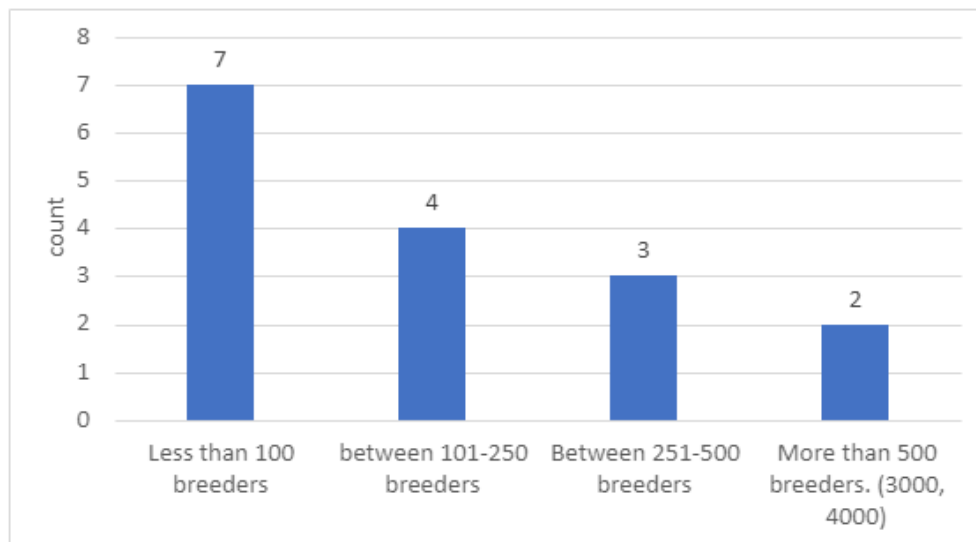
Eight of the seedstock breeders had a herd comprising of 100% boer goats, one had 100% Red boer, and one had a Nigerian Dwarf (from 50-100%) seedstock herd. The second largest (n=3,000 head) seedstock breeder indicated that their composition was 75% Red boer and 25% Kalahari reds, whilst the largest (n=4,000 head) seedstock breeder indicated that their herd consisted of 80% rangeland and 20% Kalahari reds. Two respondents had 100% Angora seedstock herds.

There was variation in the mating system KIDPLAN seedstock breeders (n=16) bred their animals (Q8: Fig. 3) with either single sire mating being the major system followed by syndicate mating. Six of the breeders indicated that they also used artificial insemination and embryo transfer as breeding strategies.

Figure 3: The mating system used by KIDPLAN seedstock producers.
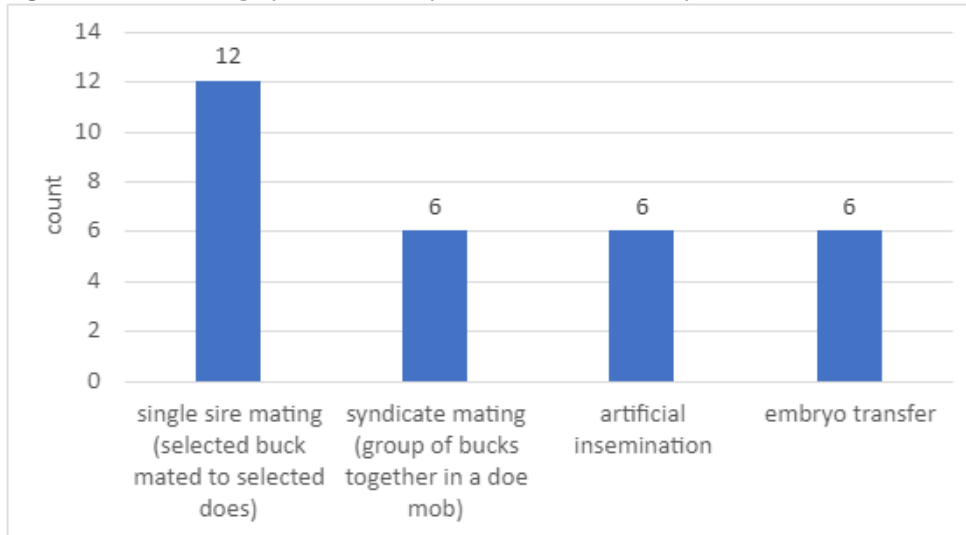

Table 2 reflects the numerous responses provided by the seedstock breeders as pertaining to the question (9) probing their decision on which buck is selected to mate with the does – the respondents could list as many responses as the thought applicable. Eight of the respondents indicated that they select the bucks on their performance linked to growth, with eight producers also mentioning conformation/structural soundness as being important. As most of these seedstock breeders belong to specific breed societies, it was expected that a number (n=5) would indicate that they select their replacement buck according to breed standards. Four respondents indicated that temperament was an important trait they select for. Although only three respondents mentioned estimated breeding values, it can be deduced that more respondents use similar criteria (i.e, production indicators – total then n=8 respondents). Only two breeders indicate that worm resistance is one of the traits they select for.

Table 2: Basis for deciding which bucks to mate with which Does.

Q9 What is your basis of deciding which buck to mate with which does? List as many as applicable. N=16	Count Grouped according to similarity of responses
Growth data/growth rate/ growth rate of buck/ Buck Weight for Age / Production figures/productivity / Fit for Purpose	8
Good Feet/Hoof form/ structure/structure correctness/ conformation of buck/ Sound Conformation	8
Breed standard/ correctness to meet breed standards / Genetic traits / Physical traits/ Buck Phenotype	5
Temperament	4

|	
Avoiding in breeding/inbreeding	3
Reproductive Rate / fertility	3
EBVs /Breeding values/ NKM/NKW	3
Milk capacity/milking history	2
Low worm burden / Worm resistance	2
Visual selection of males to females	2
All stock are run and expected to thrive under commercial conditions with the commercial herd.	1
Buck selection is based on female relatives' performance	1
Confirmation to dairy breed type	1
Early maturing bucks as kids	1
Fleece doe to frame bucks	1
Frame doe to fleece bucks	1
Group does with similar characteristics after individually noting the arears she is weak in and then match to the most appropriate buck to improve those weaknesses	1
I assess each animal does and bucks based on - overall conformation / bread standard - meat capacity - length, with & depth - head & horn set, hocks - teats teeth and testes	1
Meat capacity	1
Mother ability	1
Outcross Genetics	1
Pedigree	1
producing saleable stock	1
The better type of rangeland goat will be mated with Kalahari's that have been introduced	1
Traits to be improved upon	1
Trying to breed kids with as many positive traits as possible	1
Trying to improve upon the doe/bucks lines	1

Fig. 4 indicates the responses received from the KIDPLAN seedstock producers (n=16) to the question: (Q10) How do you sell your seed-stock breeders? Most (n=13) of the breeders sold through word of mouth. Under the response of "other", the following were mentioned: social media, export/ export breeding stock, online/ private sales, on farm sale/adverts, online and through breed society.

Figure 4: How do you sell your seed-stock breeders?
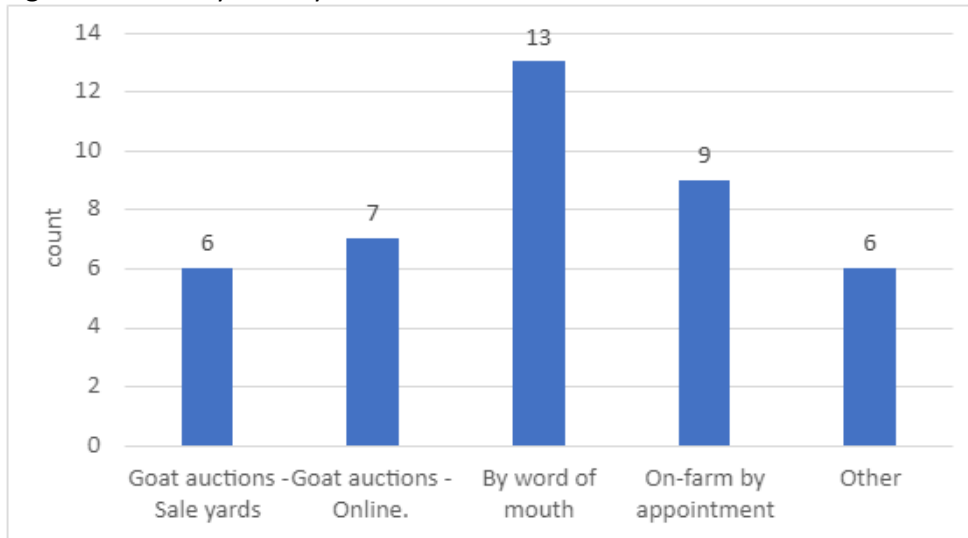
Some of the seedstock producers were member of more than one goat breeding society (Fig. 5; Q11: Are you a registered member of a Goat breeding society? Yes, which one; n=9)

Figure 5: The breed societies that the KIDPLAN users were members of.
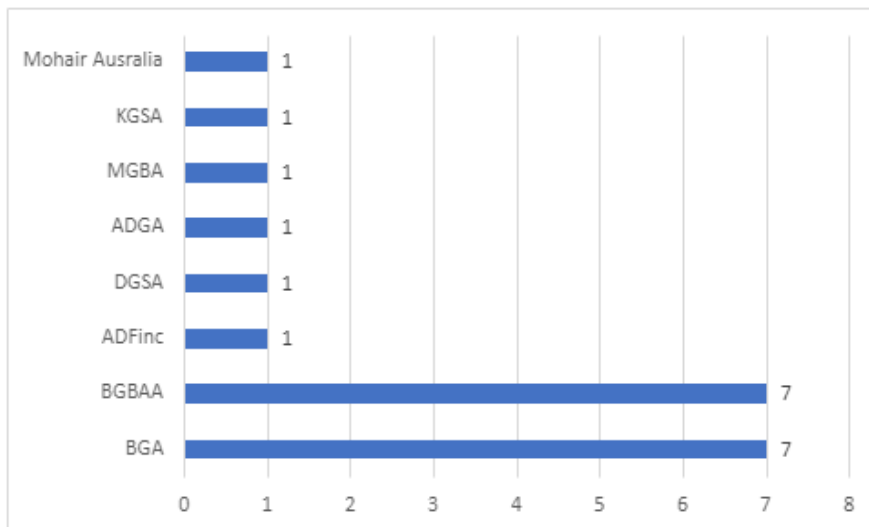
Most of the respondents who complete the survey (n=7) mentioned that it is very difficult (n=5) to use KIDPLAN (Q12; Fig. 6), some specific comments are (Q13):
   I. Hard to get started. hard to get help. very opaque and specialised terminology. Difficult input protocols and formats.
   II. not intuitive
   III. No link to Breed society, special programme to upload data, programs not intuitive, hard to get help from Sheep Genetics
   IV. Pedigree master is 'clunky'. The information is hard to understand

V.   It's an asteroid of time and energy as it doesn't give a quantum figure of selection of either keeper does or bucks nor will it improve value at meat works - it just another fast to make a farmer's life more complicated.

For the question (Q12): "*How do you find the KIDPLAN program? If NO, please feel free to elaborate*" the following responses were noteworthy for the "No" response:
  I.   It's easy enough but it doesn't find much and biases the searches to terminal traits.
  II.   Sheep Genetics website not overly user friendly
  III.   Not user friendly

Figure 6: Seedstock producers' responses to the ease of using Kidplan.
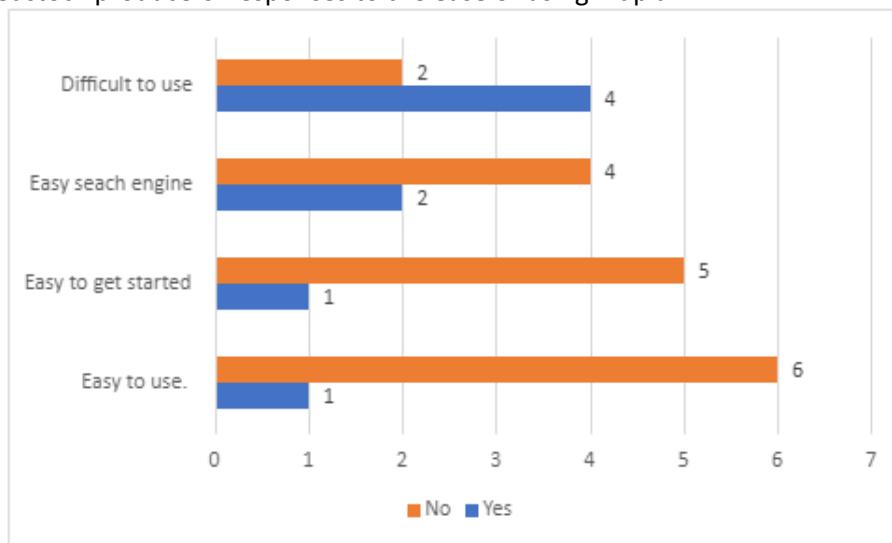
A common comment from the seedstock producers was that it was hard to get started and it was hard to get any help with from Sheep Genetics. Mention was also made that there was no link to any Breed Society's data and that the program was not intuitive.

When asked what is lacking in KIDPLAN, the following responses were noted:
  I.   Genomic evaluation, meat quality EBVs
  II.   Difficult to use and some of the measurements lead to wrong outcomes
  III.   It seems too simplistic. Need to give proper definitions of what is being recorded. We don't wean at 100 days so how can this be compared? We may have sold an animal before it is 270 days old and is already being used. KIDPLAN assumes it is held for a long time which it is not necessarily the case so doesn't get the best animals recorded. So easy to fudge the results - eg drench then do FECs.
  IV.   The EBV coverage is more than we need but we need goat-specific EBVs and indexes.
  V.   Has no purpose to any breeding plan.

The question following onto this question was "*What would you liked changed in the KIDPLAN program*?" with the following answers:
 I.   Remove it from the industry.
  II.   More user friendly.
  III.   More people using it.
  IV.   Simplify input.
  V.   Introduce a proper goat index.

Of the 28 traits listed in KIDPLAN, the following criteria were noted to be least used breeders and/or their clients (Q15, Fig.7) by the seven breeders who completed this section of the questionnaire: all traits linked to Hogget [e.g.,. Hogget Fat Depth (HFAT), Hogget Eye Muscle Depth (HEMD), Hogget Worm Egg Count (HWEC)] or those linked to carcasses [e.g., Carcase Weight (CWT), Carcase Eye Muscle Depth (CEMD), Carcase Fat Depth (CFAT)], and some of the measurements conducted on the kids [e.g., Birth Weight (kg) BWT, Number of Kids Born (NKB), Yearling Number of Kids Born (YNKB)], Gestation Length Direct (GL_DIR), Gestation Length Daughters (GL_DTR), Lambing Ease Daughters (LE_DTR), Weaning Worm Egg Count (WWEC),
Some additional traits that the seedstock producers would like to see included are: survival EBV, litter size, include feet correctness and date between trimmings, temperament, teats as a genetic measurement,
Other comments include: improve percentile Tables.

Figure 7: An indication which of the 28 traits currently provided in KIDPLAN that the seed-stock breeders and/or their clients USE THE LEAST in KIDPLAN. (respondents selected as many as applicable. N=7)
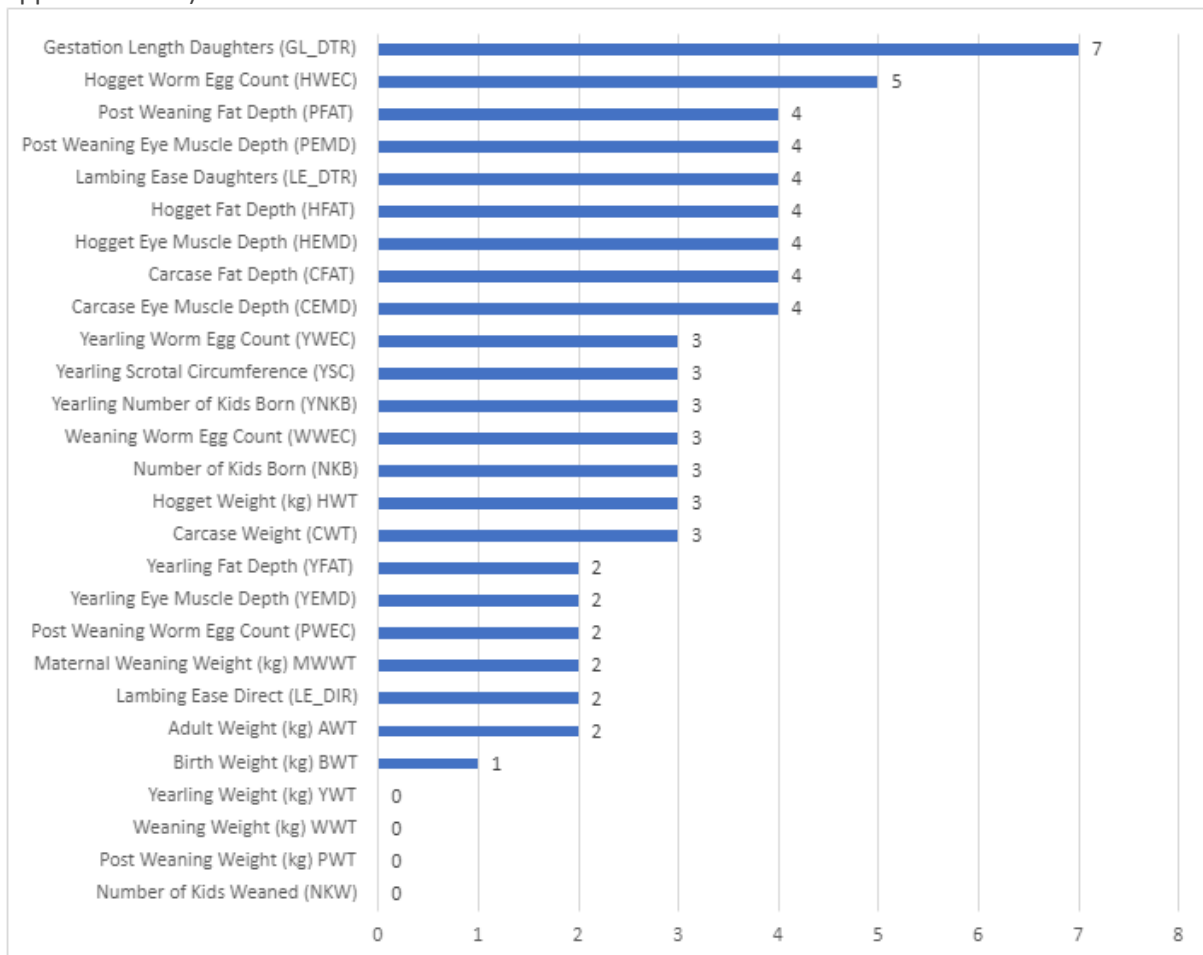
Respondents were all asked to list any other traits they would like included into KIDPLAN (Q16, N=5), the following were indicated
- Boer $ or improved version
- Kid survival
- Litter size
- Foot structure

- Carcase quality (shear force, IMF%)
- Doe fertility
- Doe fecundity
- Fast maturing traits
- Teats as a genetic measurement
- Total weight of kids produced by a doe
- Weight a 165 days

There were also some critiques from the six (out of seven) respondents who noted that the indexes calculated (Goat $ index and the Carcase Plus Index) did not meet their requirements. Their comments include (Q17;):

I. They do not reflect the correctness of the animal.
II. C+ is too heavily weighted to carcase traits, not enough given to maternal traits.
III. Lacks carcase quality, direct measure of doe fertility and fecundity. NLW likely increases litter size rather than survival.
IV. Don't really understand it because I have dismissed so many of the inputs because the definitions are not understood or considered inaccurate/irrelevant. E.g., No definitions of what many of the above 28 traits are.
V. The following should be added to the Carcass Plus index -eye muscle depth and area... EMD on its own distorts the real value... do not follow sheep data and assume it is correct for goats.

Q18 asked the respondents (n=7) which traits used in the Goat $ Index, should be REMOVED? Four of the respondents indicate that none should be removed (Fig.8)

Figure 8: Respondents indication of which traits should be removed from the Goat $ index.
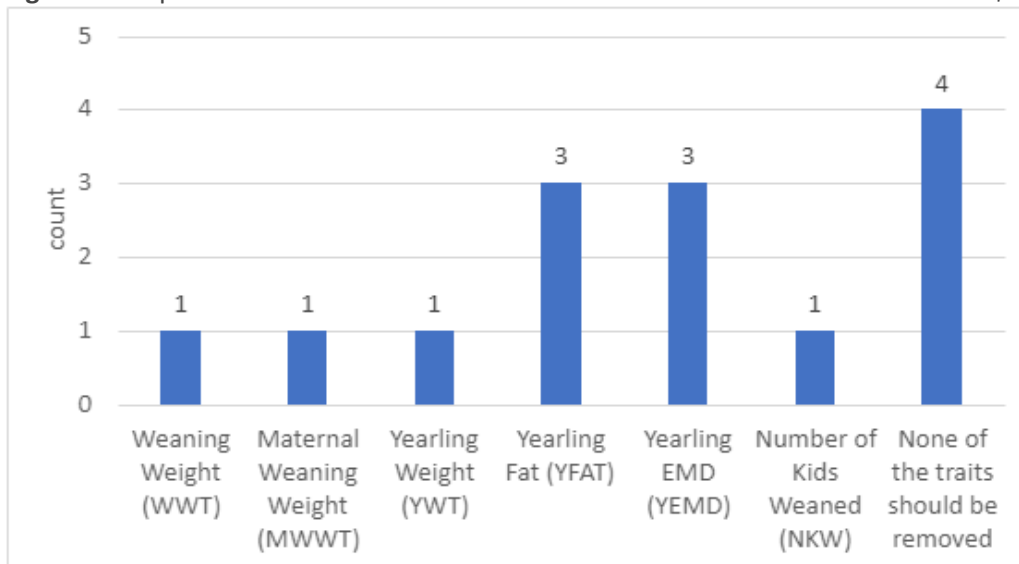
The follow-up question (Q19) asked: For the Goat $ Index, are there any traits used in the index that should be ADDED? Four of the six respondents indicated that the following traits should be added:

- Kid survival.
- Carcase quality and doe fertility and fecundity.
- Lambing ease.
- Kg of kids weaned %kg of kids weaned to dam weight.

Q20 asked the respondents which traits used in the Carcase Plus index should be removed? Five of the seven respondents indicate that none should be removed whilst the following three indexes were indicated by the two respondents:
- Post Weaning Weight (PWT)
- Fat Depth (PFAT)
- Eye Muscle Depth (PEMD)

Four of the seven respondents indicated that the following traits should be added to the Carcase Plus Index (Q21; each bullet point represents each response):
- eye muscle depth and area... EMD on its own distorts the real value... do not follow sheep data and assume it is correct for goats.
- YWT, YEMD, YFAT
- Carcase quality (sheer force, IMF%)
- MWWT, Yearling WEC

Q22 asked the respondents which the important traits they think should be included in a goat index? Four respondents gave the following:
- Kid survival, all growth rate traits, worm resistance, muscling and fat.
- Separated fertility and survival from NLW. Typically, fertility and fecundity is high in goats. Improvements in NLW need to focus on maintenance of litter size and improve fertility and kid survival.
- Body structure trueness to bred standards.
- Average Daily Gain for each measurement period. That is my main KPI - Growth every day.

Q23 asked the KIDPLAN users if they had any additional comments regarding indexes used in KIDPLAN and the following three comments were recorded:
- If it can tie into the information held and already supplied to BGBAA I would support it. I found it difficult, complicated to add data, did not include areas of interest to me as a breeder. I found the breeders who use it most closely end up with animals that have lost their correctness in body shape, legs, testicles and no longer meet the breed standards.
- Figures can be changed by humans to stunt needs of grower.
- Really don't understand the core information that is used to derive the indexes due to lack of proper documentation of their definitions.

Five of the seven respondents indicated that their clients DO NOT use KIDPLAN's indexes to help in their decision on which animals to buy (Q24). The two respondents who indicate that their clients do use KIDPLAN, listed the following as being used by their clients:
- A few do. They like C+ and B$.
- WEC and C+.

Five of the respondents indicated that they used the following data entry system for their goats (Q25).
- BGBAA stud registration
- Pedigree wizard & Excel
- Pedigree master
- Weaning weights and fibre weights for 3 years
- Excel. Livestocked software

The last question specific to the seedstock goats section asked the respondents whether they used any other pedigree/seed-stock recording system for other livestock species? The following were indicated as being used (n=3):

- Cattlemax
- Sheep - MerinoSelect. The ability to use genomic information from SNPs to improve accuracy of genetic estimates
- Pedigrees

4.1.2 Commercial herd

Five of the Seedstock producers who use KIDPLAN also had a commercial herd, three answered the last set of questions around their commercial herd. One respondent had between 501-1000 breeders, one between 1001-2000 breeders and one between 2001-5000 breeders.
The composition (Q28) of their herds is depicted in Fig. 9 below. Of interest is the large portion of boer goat crossbred to the rangeland goats in the commercial herd indicating that the producers are in the process of upgrading their herds to a more meat-like animal. All three respondents indicated that they sell their commercial animals from farm to farm directly (Q29), whilst one respondent also sent animals to the live sales yards, and another sent the goats directly to an abattoir. All three respondents also indicated that they use their own seedstock animals to breed in their commercial herd.

Figure 9: Breed composition of Seedstock producers' commercial herd.
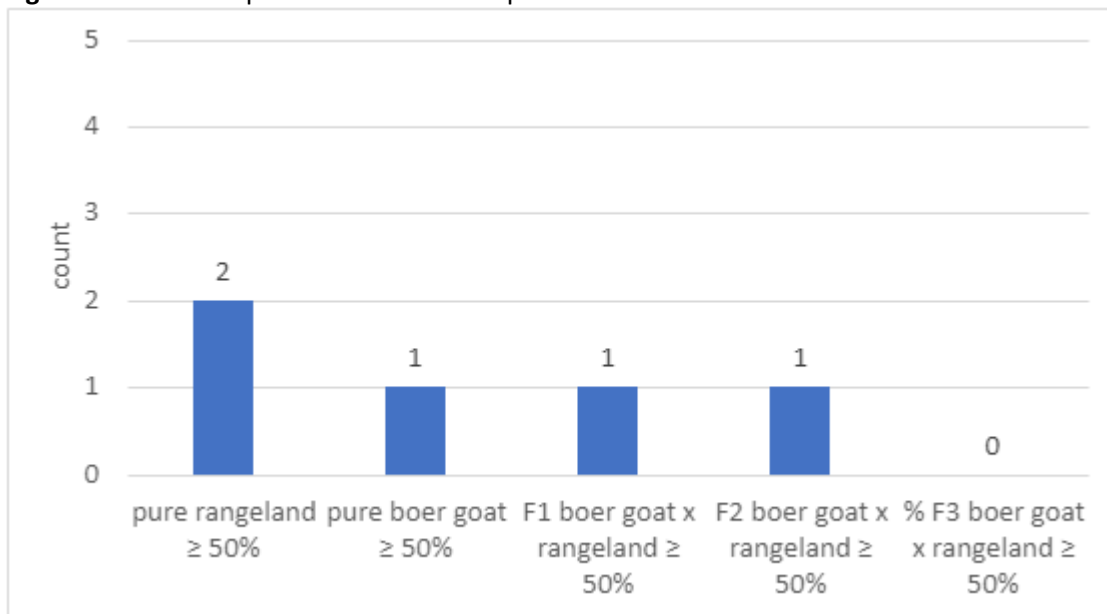
## 4.2 Seedstock and/or Commercial Producers

Of the 49 commercial producers who has supplied basic data, eight of these respondents were only seedstock producers whilst a further 18 had both commercial and seedstock herds (Fig. 10).

Figure 10: Breakdown of commercial and seedstock (who do not use KIDPLAN) producers (n=49) who responded to the questionnaire.
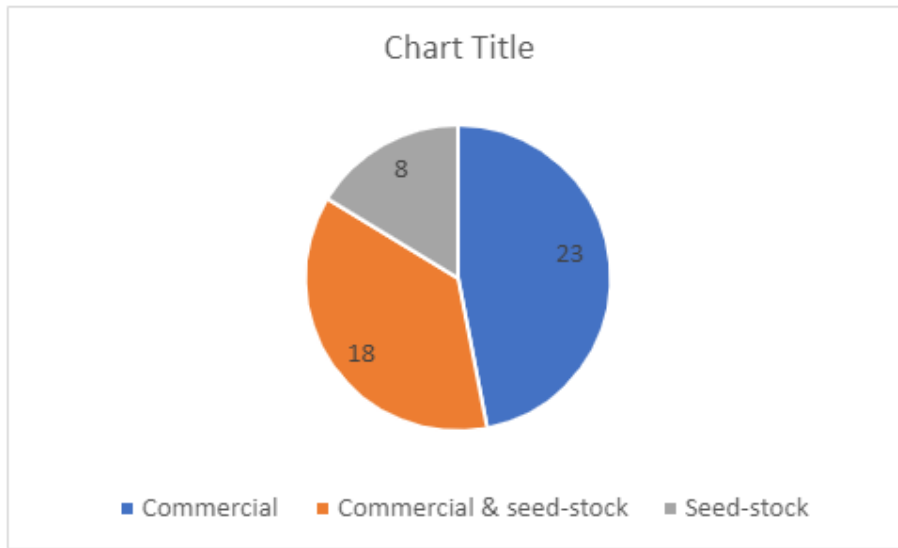
The size of the breeding herds varied (Fig. 11) with 5 having >5,000 (sizes 7,000, 10,000, 12,000, 20,000, one respondent did not indicate the actual size of the Doe herd) commercial breeding Does.

Figure 11: Question 7. How large is your commercial nanny (breeding) herd? More than 5000: 10000, 7000, 12000, 20000. Commercial producers n=41.
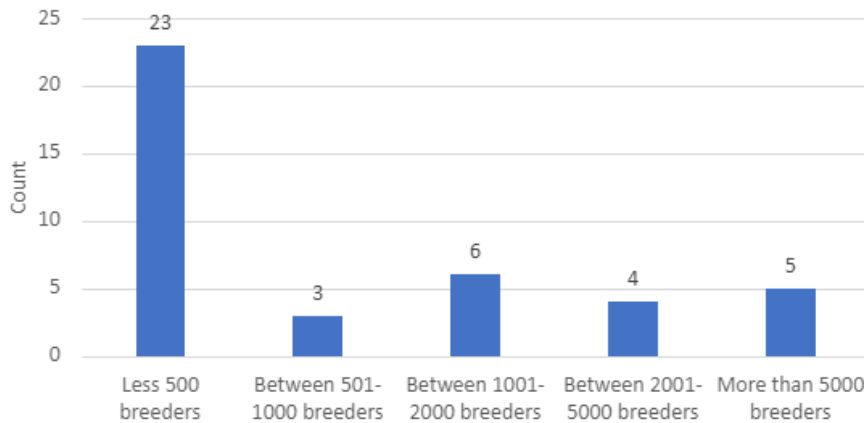
It was interesting to note that a high number (26 out of 41 respondents who answered Q8: do you have a controlled mating season?) had a controlled mating season, some of the producers also had two breeding seasons per year or bred every eight months (joining for a 5-week period), a number only joined for 42 days whilst others joined for 5 weeks (twice a year). Most joining was mid-summer or early autumn or spring.

The target market (Q9) for the goats also varied (Fig. 12) with 30 producers sending their goats direct to the abattoir whilst 24 sold their goats from property to property. Some of the seedstock breeders either sold their bucks on Auctionsplus or via export, whilst a few producers also sold direct to butchers or direct to customers. Two respondents indicated that they sold their fibres (2) indicating that they were Angora goat producers.

Figure 12: Main target market of commercial goats (n=41 respondents).
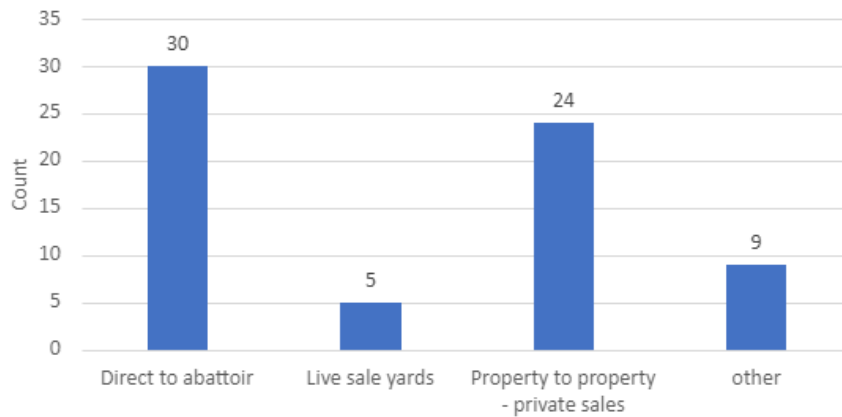
The next set of questions were designed to provide insight into where the non-KIDPLAN Seedstock and commercial producers purchased their replacement animals from.

Thirty-six of the 41 respondents bought in seed-stock to improve their herds with the majority of the former visiting seedstock producers (Q11) on their property to buy their replaced bucks (Fig. 13). The responses for other (places where they bought in their seedstock) were. Gumtree; seed stock auctions; due to biosecurity only selected properties with shared breeding goals; Angora Goat stud auctions.

Some of the traits selected for (Q12) included structure/structural correctness/legs/teats, frame, conformation, eye muscle area, fertility as well as scrotum size, fecundity, mothering ability, early maturing, post weaning weight, good feet. Several respondents also highlighted temperament/ docility as a sought-after trait whilst others highlighted the importance of the goats being able to survive in their region whilst one producer also mention the importance of biosecurity.

Some respondents mentioned a good clean head and horn shape/set, and colour.

Figure 13: Source of bucks used by commercial producers.
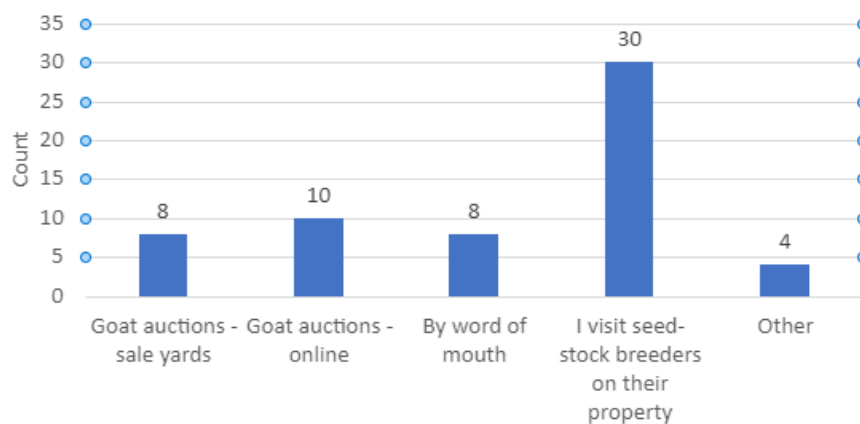

Thirty-three respondents answered Q13: Do you use Estimated breeding values (EBV) or indexes when making your decision to buy seed-stock animals? Only six respondents used EBV and listed the following Estimated breeding values (EBV) or indexes they use: BWT, MWWT, WWT, PWWT, PEMD, AWT, NKW, PFAT, PEMD, B$; one respondent indicated they had just started out with EBV's, whilst

another respondent indicated that if no EBVs are available, they like to create their own whilst another indicate that they also like to measure scrotum circumference.

The next Q14 was designed to find out why the 27 (out of 33) producers did not use EBVs (What are the reason/s to NOT use Estimated breeding values (EBV) or indexes when making your decision to buy seed-stock animals?). Their responses are depicted in Fig. 14.

Figure 14: Reasons why commercial producers do not use EBVs when purchasing replacement breeding stock.
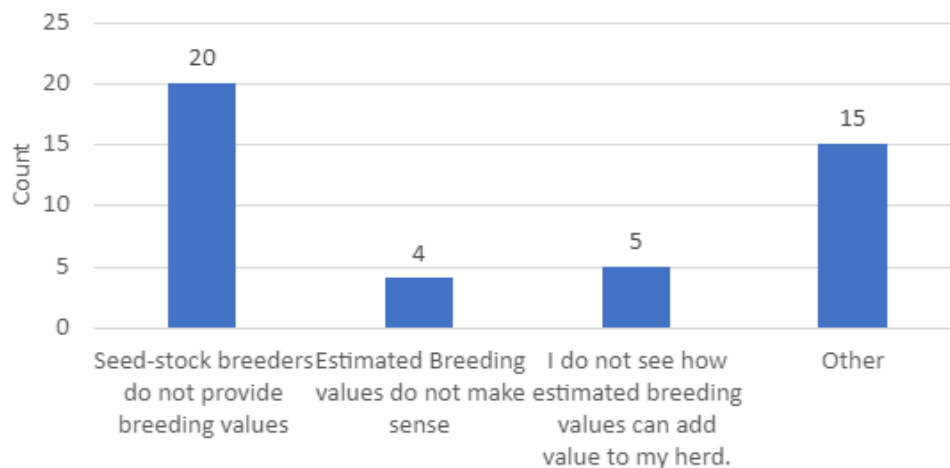
Interestingly, 20 of the respondents (to Q15) indicate that their breeders should provide EBVs or indexes, whilst five respondents indicated that they cannot see how EBVs can add value to their herd. Another four respondents had a similar response that the EBVs did not make sense.
Some of the "other reasons" for not using EBVs were:

I. Not relevant to my business I don't make a premium on product or animals with EBV score, I do not know what they are (4)
II. They are also livestock, EBVs are not often based on performance in rangeland conditions (1); The key reason why Australian rangeland goats are so productive and drought resilient is due to natural selection (1)
III. Our view is to try and select goats that have the ability to put additional weight on without compromising the fertility, maternal qualities and toughness.
IV. I do not know what they are/my lack of knowledge (n=4)
V. Insufficient data and stock available / There are not enough animals represented in KIDPLAN to be significant and the amount of cross breeding and the non-ability to measure hybrid vigour.
VI. Just wanting to get some more consistency in the breed. Especially structure and feet are the first traits we look for. We would consider the weights and fertility history.
VII. There needs to be far more traits covered. Fertility in a doe drives profitability before most traits covered
VIII. Many producers do not have enough stock to participate in KIDPLAN for EBV'S
IX. It is not common in goat breeders
X. Why aren't Angora goats receiving any research attention to establish EBVs?

Of the eight respondents who answered Q16 on how they improve the genetics of their herds, six indicated that they breed/select their own seed-stock animals whilst one respondent indicated they buy from their neighbour/other producers. The 8th producer indicate that they import semen (obviously a seedstock producer who does not use KIDPLAN).

The following were selection criteria for replacement Bucks (Table 3):
  I.   Visual, weight gain rate, eye muscle depth
  II.   Structural integrity, sound legs, low maintenance feet, correct angularity thru skeleton, rump structure re pelvis, muscling, maturity pattern, temperament, joining vigour, overall strong constitution, growth for age, testicular size, testicular attachment, feed efficiency, less susceptible to laminitis (yes it is genetic!), teat structure, trueness to breed type.
  III. Large & heavy
  IV.   Frame, head, colour, good strong robust mover, good thick ears and lower legs
  V.   Nine T's - teeth, toes, torso, testicles, tossels (also known as tackle), teats, tailweb, tossers, temperament & history/health status.

Whilst the following were selection criteria for replacement Does:
  I.   visual, teats and udder, muscling. Not 'femininity'
  II.   All of the above, but switch to udder attachment, test structure including size and shape, even more emphasis on hind end angulation for easy kidders, maternal vigor, kid protection instinct. Lactation performance. Replacements selected obviously as weaners but monitored very closely thru 1st kidding and culled if don't perform (same respondent as II above for Bucks).
  III. None
  IV.   Frame, size
  V.   None
  VI.   Seven T's - teeth, torso, teats, tailweb, tossels/tussles, temperament & history/health status

Table 3. A list of the traits that seedstock goat producers look for when purchasing replacement animals (each row indicates a specific producer's choices)

List of traits seedstock producers look for when buying goats to improve the genetics in their herd. (List as many as applicable).

good strong robust mover	good thick ears and lower legs	true to type of red Kalahari							
Structure (legs)	Weight for age	Carcase traits	Fertility	Docility	Milking ability	Correct teats	Constitution	Mature weight	
Post weaning weight	Adult weight	Kids weaned							
Structure	Fertility	Genetics	Carcass yields	Location					
Soundness & conformation	Length of loin & meat capacity	Good feet & legs	Paddock doability	Fertility	Mothering ability	Worm resistance	Temperament	Breed type & pedigree	Colour, coat & hornset
Breeding % ie F1 or purebred.	Conformity to breed	Teats on bucks.	Muscling on sire and dam.	How they have been raised ie paddock v hard fed.					
Early maturing	Robust sound frame	Ability to survive in our area	Good feet	Not coming from a pampered back ground	Good confirmation	Good horns	Whether it is a single twin or triplet	Survivability of both twins	bone
eye muscle depth Visual	high early growth rate ENV	temperament	scrotum size	scrotum attachment	number of teats and or spacing	single kids from single doe's			
Size	Meat carrying ability	Good feet	Overall structure	Mothering ability					
breed purity	fertility (kiddings per year)	Fecundity	teat faults	legs	mature size/weight	functional faults (mouth etc)	milk		
Top line- eye muscle	Length	Teats	Feet	General structure - quality of head	Width over top line				
length and width	maternal instinct	milking ability	head shape	composition					
Muscle	Growth	Maternal traits							
Frame	Colour	Progeny							
Structure	Feet	Weights	Fertility history						

Teats	Hoof	Structure	EBVs	paddock raised	worm resistance	Temperament			
Body type	Growth rates on kids	Fibre type	Profitability						
Good balance in body	Good clean head and horns	Good feet and teats	Big solid	Good temperament					
Teat structure (both male and female)	Feet conformity	Weight gains	Body conformation	Mothering ability	Temperament	Horn set	Biosecurity aspects	Disease free	Drench resistance free
Single Teats	Markings	Ears	Long bodies	Good mothering abilities	Stocky build	Easy Handling	Quiet Stock		
length	muscle	teats	mothering	micron	temperament	feet			
Good Teats	Markings	Conformation	Age	Temperament	Health				
Teats	Feet	Enoblement	Structure						
Head	Structure	Fertility	Worm resistance	Genetics					
Meat Capacity	Udder	Horn Set	Hooves	Temperament	Hardy / Health	genitalia	depth	width	colour
structural correctness	teat conformation	growth	carcase and yield	true red boer breed type					
Fleece weight	Fleece staple length growth rate	body weight gain from birth to weaning	maximum body weight at 3 years	micron cv%					
Fertility	Robustness	Early growth	Maternal fatness	Muscling	Feet	Teats	Colour		

As this specific Questionnaire was designed to gain insight into both commercial producers as well as seedstock producers who were non-KIDPLAN users, the next section reports on the information supplied by the Seedstock producers (most of these questions were like that in Section 4.1 applicable to KIDPLAN users).

Of interest is the sizes of the seedstock herd (Table 4) with one producer indicating that their herd was >3,000 does.

Table 4: Size range of the seedstock herds from non-KIDPLAN breeders

Less than 100 breeders	16
Between 101-250 breeders	7
Between 251-500 breeders	2
More than 500 breeders	1

Of the 28 seedstock producers who indicated their breed, 11 had 100% boer goats, one breeder had 100% red boar, two had 100% Kalahari reds, with the rest of the breeders having various ratios of Boer goats, red, Kalahari and blacks. One producer had a 3,000 seedstock herd called the "Contender -100%", another breeder (251-500 breeders) had a herd that was 80% boer goat and 20% polled, one of the respondents had a Mohair seedstock stud and sold his animals at shows.

Fig. 15 indicates how most of the seed-stock (non-KIDPLAN users n=26) sell their goats (Q22), with the majority selling their goats by word of mouth (22 respondents), whilst 10 either sold online, or indicated "other" avenues of sale.

Figure 15: A breakdown of how seed-stock producers sell their animals

An additional option was for the producers to indicate other avenues that they use to sell their seedstock animal (other n=10), these include:
I.   On property auction
II.   Various, catalogues, Facebook, word of mouth
III. videos on web
IV.   On our Facebook and web site
V.   Facebook Page, Show Results, Website
VI.   Gum tree

VII.   Facebook page (x2)
Facebook seems a popular venue to advertise and sell their animals.

Most of the respondents (n=26) indicated that they were registered members of a Goat breeding society (Q23) with some indicating which society BGA (9), BGBAA (10), KGAA (4), Mohair Australia (1) and/or BGBAA and/or KGAA – two indicated that they were members of both the two boer goat societies. Four breeders indicated that they were not a member of any breeding society.

Most seedstock producers (n=25 respondents) marketed their animals (Q24) at specific weight/age whilst others also used EMD and colour as parameters (Fig. 16). Only five seedstock producers indicated that they used EBVs as part of their marketing strategy. There was also an option to indicate which other criteria was used to market seed-stock goats and the following responses were recorded:

        Bloodlines,
        Conformation,
        teats & teeth,
        Genetics/Pedigree,
        Photos,
        Polled early growth,
        Quality,
        meat capacity,
        soundness,
        reproductive qualities,
        feed conversion,
        specific requirements of the purchaser,
        structural and teat correctness/Teat structure,
        mothering ability,
        Borodin,
        They are structurally correct and meet the breed stand and have correct teats,
        visual,
        Western bred for the west.
        The following were responses from the Angora goat breeders: Fleece weight, fleece staple length growth rate, micron, micron CV%.

Figure 16. Indicators used by non-KIDPLAN seedstock producers when marketing their goats
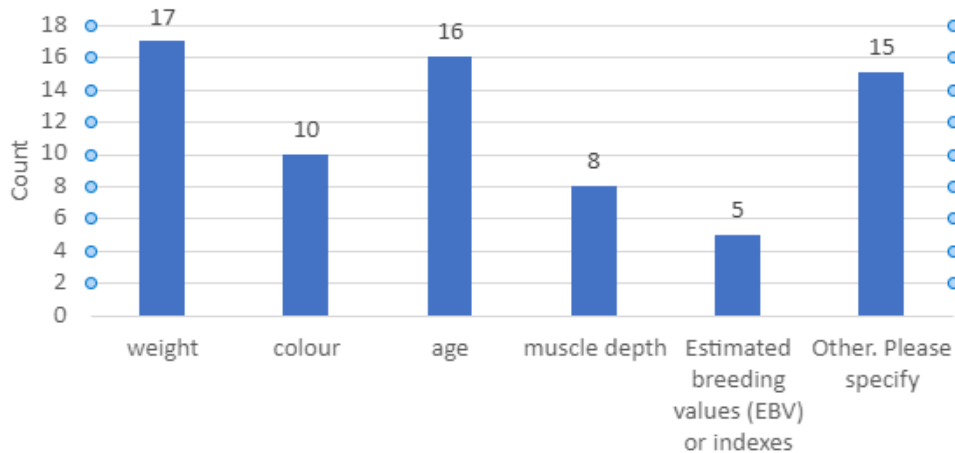
There were some interesting responses to why producers (Q25) did not use KIDPLAN (Fig. 17) which include:

i. Found it difficult to interpret and use as compared to beef cattle breed indexes

ii. Our progress is too quick to know where to start. We would like to add figures to our promo material and welcome input as to how to collect the data on a large-scale operation

iii. I don't know about it

iv. As a capretto producer body scoring and weight for age are my criteria for my product

v. I feel the AI Trial a few years ago was exclusive and did not include high performing animals alive at the time and the accuracies gained by using semen from animals that died years ago was aimed purely to benefit particular parties.

vi. I do not like the term % inbred which does not align with a stud which linebreeds and performs internationally at the highest levels.

vii. I don't think it captures all it should and quite frankly it isn't that well regarded by commercial producers who see high indexing animals of extremely poor breed type and with major structural faults.

viii. It should have been the obvious system for me to join and I use breedplan for my stud cattle, but in goats quite frankly I see it as inept

ix. We are extensive and not controlled breeding program - other than removing billies from nannies twice a year

x. There are structurally correct and meet the breed stand and have correct teats

xi. Yet to access I will

xii. Too complicated, it is not easy to use, inputs and outputs are not explained well. Have different numbers for animal identification, I should be able to use the animal's registration number. There is correlation between EBV and the breed standard. An animal could have great EBVs and not meet the breed standard. Classification should be part of the EBV.

xiii. Not enough data collected to be relevant, I have 3 sheep breeds in sheep genetics.

xiv. Have never studied it

xv. Don't understand it

xvi. The only people I know of that use "KIDPLAN" seem to get high results for poor quality animals.

xvii. To complicated I need it to interface with a suitable pedigree programme

xviii. Again. My lack of knowledge. I have only just learnt about KIDPLAN in the last 2 months.

xix. Don't have the numbers

xx. Kalahari breeders don't seem to use it and haven't heard anything about it

xxi. Have not had the technology available, no internet coverage and mobile phone coverage is hit an miss.

xxii. Again, don't understand how to use it.

xxiii. Only heard about it yesterday

xxiv. Didn't know it existed.

Figure 17: Pooled reasons why producers did not use KIDPLAN.
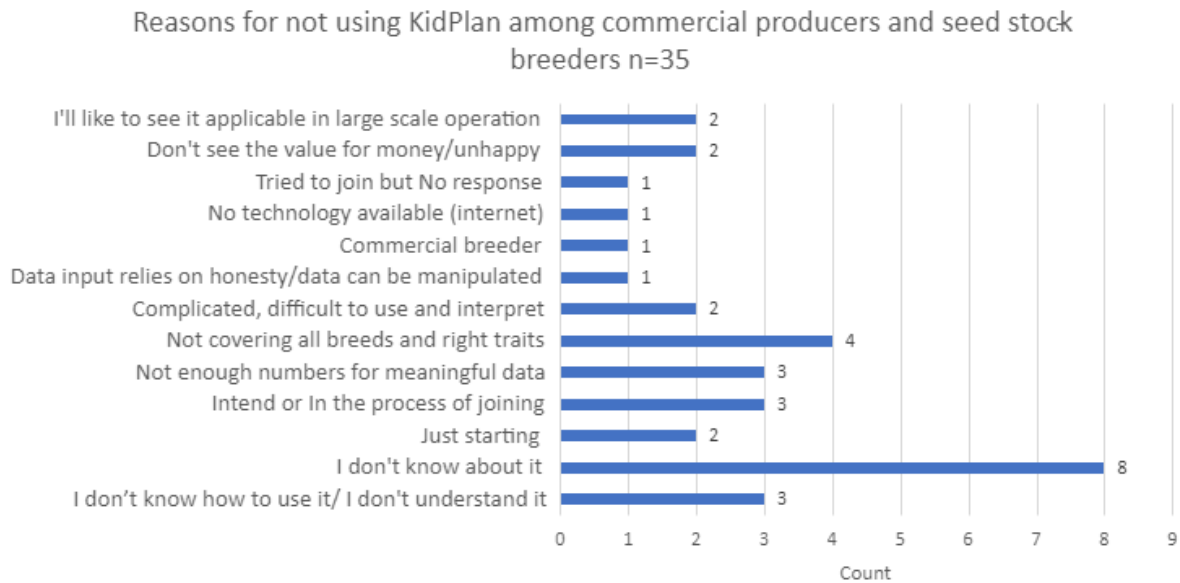
Although 11 respondents did not know about KIDPLAN and/or how to use it, those that did felt it did not meet their needs and/or was not up to the standard of other breeding programs that they use on cattle and/or sheep pedigree animals. Within the latter group were numerous seed-stock producers (26 out of the 46 who responded) who had developed their own systems (n=12) or used that of the goat associations (Goat associations - Mohair, BGBAA, BGA; n=3;) or Livestock Lineage Database (n=3), Stockbook (n=2) or Agview 360 (n=1), or Pedigree master (n=1), or KISS -farm dairy (n=1), or True test (n=1), or Pedigree for generations (n=1), or Sheep genetics (n=1).

Some comments of note on the systems' they use include:
  i.   My system will become inadequate once our generational progress slows down. As all our stock become 'superior' to find the cream will require a depth of recording that can only be achieved from electronically recorded data
 ii.   Hardcopy Folder with individual pages for each nanny, which are individually ear tagged with their own number which corresponds with my book.
iii.   I keep my own records, and have done for 25 years of stud breeding, with my own scores and notes for all the traits outlined earlier. We practice high observation low intervention kidding, so to give an example. I want a doe to - pick a suitable sheltered place to kid. Kid within 30mins from first show of membranes, clean kids face before kids back legs are out of her, clean her own teats and remove keratin plugs, get kid up and drinking quickly, and then get down to have consequent kids with her body blocking prevailing winds and protect them. I expect the does to be aggressive in guarding her kids and vigilant of all threats. This type of doe gets a score 5 on kidding vigor etc. If she lazes around doesn't clean kids faces, and lets anything near her, or conversely nicks off if disturbed, she is score 1 and culled.
 iv.   Currently excel database will transition to breed elite software
  v.   Currently a manual system.
 vi.   Our own created system
vii.   Double Ear tags, carry tattoo numbers /Handwritten registers
viii. Livestocked, can be used offline, has all the same features as KIDPLAN if used properly, can use EID reader with it, can use it for finance and report are very easy and contain a lot of data.
 ix.   Pedigree for generations

 x. I have a goat breeding book and all my goats are numbered and written in that book so if I need information about a certain goat, it is all there.
 xi. Stock book - practical systems/Simple to use
 xii. Agview360, all animal information, progeny, medication etc
 xiii. Excel spread sheets and books

The follow-up question to those seedstock producers who do not use a recording system, was to explain why they do not use one. The following responses were noted:
 i. Haven't come across an easy and manageable way to do so as yet.
 ii. As long as the Doe can produce and raise a kid each that meets specification that is all that is required
 iii. Not applicable to large scale production that we have. No extra value to our bottom line
 iv. I find the pedigree information through the Association is enough
 v. Looking to use Livestocked as it is more affordable currently we use Excel & manual records Pedigree master is too clumsy, we set up Gallagher and have used https://www.tambero.com/
 vi. Unsure what to record
 vii. New to the Industry / Early startup. Yet to reach that stage. (n=2)
 viii. Use farm diary and record info - not enough animals for database
 ix. Less than 100 does, paper fine

Twenty-seven of the 46 respondents indicated that they do use other pedigree/seed-stock recording systems (Q27, Fig.18) which include:
 i. Sheep, to a very limited extent
 ii. NLIS database for Cattle
 iii. Breedplan. Cattle
 iv. Working as stock agent and in using sapien for sheep operations
 v. sheep, Stockbook, ease of using it and the customer service
 vi. Sheep. Same as above for goats
 vii. Paper/manual records
 viii. Cattle
 ix. https://www.tambero.com/ and manual records
 x. use Livestocked for all animals on our property.
 xi. Home made
 xii. Angus Australia/Angus bulls
 xiii. I also have cattle and I record them in the same way as my goats.
 xiv. First ever 30-point genomics for goats, every goat data collection on profit points

Figure 18: An indication of the different recording systems used by seedstock goat producers on other species.
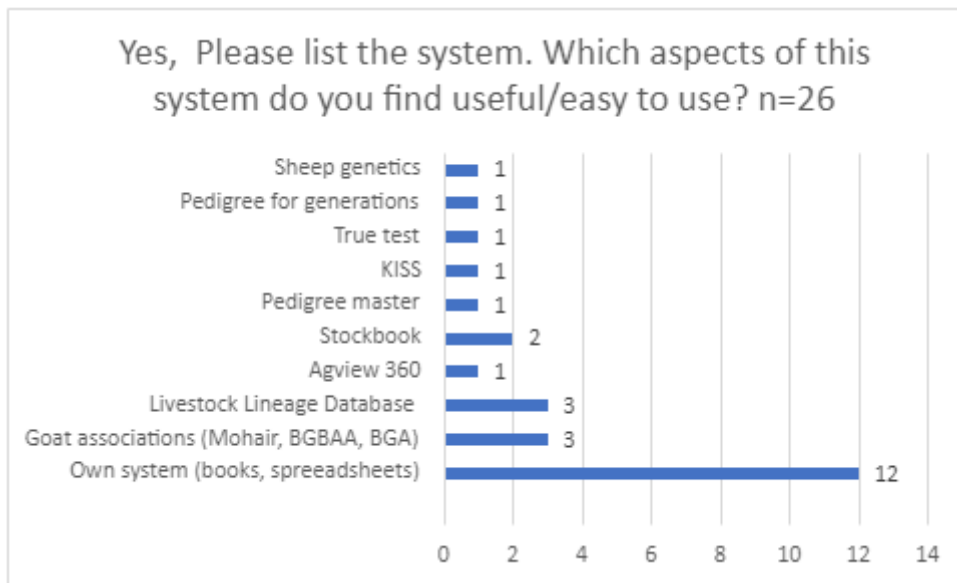
Thirty-seven of the respondents indicated that they would like more workshops on how to improve the genetics of their herds (Q28). The Questionnaire was also used to ask respondents what additional information pertaining to goats they would like MLA to provide (Q29). The respondents indicate that the information they would like to receive from MLA include:

i. More info on how to go about starting KIDPLAN
ii. Would like to see some field days in W.A
iii. How to improve mothering ability in a herd to increase number of kids at marking time
iv. How to compare stock between different management operations, without losing the genetics to a group breeding program.
v. Nutrition of Goats in agricultural settings is the greatest gap in knowledge that is holding the farmed goat industry back supplements / mineral
vi. If its not skewed and based on fact. The MLA case studies on red goats and their superior mothering and apparent invisibility to predators was here say, rubbish and quite frankly disastrous to the industry. Very disappointed as a levy payer.
vii. We need more useful producer education on parasite management and a program where vets will actually provide off label recs because most wont due to fear of litigation. There is a dearth of useful information and a whole lot of hearsay, so use facts, rather than hearsay.
viii. And somehow if your going to promote breedplan, try and find producers who breed a structurally sound true to breed type animal to promote it. The cattle industry can but I am not seeing it in goats.
ix. Health management, innovations and new technologies, chemicals, drenches, vaccinations. Be able to give feedback on how drenches, vaccinations, etc are working on our animals.
x. Drench availability and the use of a wider range of product
xi. More marketing about how to look after your goats, more support to vets to educate them selves on goats.
xii. Similar type of training and support that the sheep and wool industry gets would be a great start ie: lifetime ewe or more lambs more often program
xiii. An updated list of active goat processors and their capacity, how to build a premium market for premium meat animals / The breed be focused on meat and the possibility of premium markets becoming available

xiv. The boer goat associations run workshops. a breed standards booklet is available on the boergoataus.com.au as a guideline for fullblood Boers goats but could be useful in determining what good seed stock should be

xv. More ways to protect out goats from wild dogs

xvi. Options to pool goats for sale as some abattoirs will only accept minimum of 50 - for some reason Boer goats are discounted compared to rangeland

xvii. Research on paddock fed goats versus supplemented goats. And then what plays a bigger part, genetics or feed.

xviii. Useful infrastructure when handling goats-eg goat handler similar to sheep handler. Also if scanning-a better set up.

xix. Physical management practises. Paddock & yard design. Protection from predation. Tagging methods.

xx. More information about angora goats and their productive side of fibre production -meat and fibre

xxi. Everything

xxii. Growth rates of particular breeds

xxiii. We need to do more quantifiable research. Bucks vs wethers, and in different crosses.

xxiv. Want to make sure that we grow the industry with its natural qualities and stuff it with toffs telling the grass roots what to do.

xxv. Don't know

5   Conclusion

5.1   Key findings

The KIDPLAN seedstock users and other Non-KIDPLAN seedstock producers highlighted the following shortcoming with KIDPLAN:

- Unfriendly interphase/system.
- Unable to link KIDPLAN with Breeding Societies registration data.
- Lack of support staff.
- Program not intuitive.
- Searches biased towards terminal traits.
- There were some strong negative views of KIDPLAN that include:
    - It should have been the obvious system for me to join and I use Breedplan for my stud cattle, but in goats quite frankly I see it as inept
    - We are extensive and not controlled breeding program - other than removing billies from nannies twice a year
    - I don't think it captures all it should and quite frankly it isn't that well regarded by commercial producers who see high indexing animals of extremely poor breed type and with major structural faults.
- Incorrect measurements.
    - Hogget information hardly used.
- Need goat specific EBVs.
- Problems with selection indexes.
- Many felt that EBVS were not relevant to their business and/or they do not make a premium on product or animals with EBV score.

- There are not enough animals represented in KIDPLAN to be significant and the amount of cross breeding and the non-ability to measure hybrid vigour.
- There needs to be far more traits covered. Fertility in a doe drives profitability before most traits covered do not address this.
- Many producers do not have enough stock to participate in KIDPLAN for EBV'S

The following findings were applicable to the commercial producers:

- They did do not know what EBVs are/my lack of knowledge
- Insufficient data and stock available
- It is not common in goat breeders

5.2   Benefits to industry

One of the main (and easily rectified) suggestions is that the Administration around the use of KIDPLAN be more approachable to potential users – one such response could be a dedicated Goat home page on the MLA web (presently, potential uses enter via the sheep portal). This will make the information more readily available to goat producers.

The responses highlighted the need for the indexes used in KIDPLAN to be revisited and to be more focused on goats.

There was a definite indication from goat producers for more research based but practically applicable information from MLA in terms of workshops, information days, handouts, etc. This will help the industry transform to a more balanced livestock management system.
There were also several requests from "new" producers who were looking for basic information such as handling infrastructure (fencing, handling facilities), veterinary medication, herd management (joining – season vs. all year round, weaning, etc).

6   Future research and recommendations

This study highlighted the shortcomings of KIDPLAN – core to these were that the EBVs and indexes be re-visited/calculated and that they be more goat orientated.

More information was requested around the factors that influence the productivity of the enterprise (kids weaned/survival).

There was also a request that scientific proof be provided that showed whether/which breed crosses were superior or not.

There was strong request that research around medication for goats be conducted, presently off-label medication is recommended by some veterinarians, although there was no agreement/ consistency around what works.

There was a request for more information from MLA (using all the various media/platforms available) around the farming of goats.

7 Appendix

7.1 Questionnaires

These will be inserted into the final report.

7.2 Data sheets

These will be provided as attachment separate from the final report.