

APPENDIX A SURVEY ON COWPEAS

INTRODUCTION

The survey aims at collecting information on the current status of cowpea production in target communities in Mpumalanga. Emphasis is placed on the agricultural practices used for storage of the seed after harvest, uses of the crop and health aspects due to the consumption of the seed and food products thereof.

Name of interviewer	
Date of interview	
Respondent name (group)	
Name of production locality	

[Where applicable, mark by “x” in the . If more than one option is applicable, mark more than one]

A. Biographic profile of respondent

1. Gender: Male Female

2. Age of respondent

3. What is your major livelihood/source of income?

Agricultural activities

Other Employment (Please specify)

.....

B. Agricultural profile

4. If various agricultural activities are practiced, please rank these activities according to their economic importance.

- a. d.
- b. e.
- c. f.

5. What is the size of land available for agricultural activities?

..... unit

C. Importance and role of cowpea

6. Which crops do you rank as the 5 most important for household food security and for cash sale as income generation? Ranking (1 - 5)

<u>Crop</u>	<u>Food</u>	<u>Cash</u>
Maize
Cowpea
Other legumes
Fruits
Vegetables
Other

7. Why do you choose to produce cowpeas? (i.e. tradition, good at it, right climate, soil, good income, crop rotation? etc.)

.....

8. For what purpose do you use your cowpeas?

- Sell to generate income Own consumption
- Animal feed Medicinal purposes

9. If you are selling your cowpea seed, to what extent does it contribute to your household income?

Small Average Large

Percentage contribution%

10. What is the annual income of your household from cowpea?

< R100 R100 - R400

R500 - R900 More (specify)

11. How often do you eat cowpea?

Daily Twice a week

Once a week Less than once a week

12. Where do you get cowpea to eat?

Local market Hawkers

Own produce Shop

Other

13. How do you consume cowpea?

Whole cooked seeds Ingredient in dishes

Leaves as a vegetable Fresh pods

Ground seeds as a porridge Baking product

Other

14. Do you have a preference of cowpea seed type?

Light coloured seed Dark coloured seed

15a. How often do you use cowpea seed as feed for your livestock?

- | | | | |
|-----------------------|--------------------------|--------------|--------------------------|
| Never | <input type="checkbox"/> | Once a week | <input type="checkbox"/> |
| Less than once a week | <input type="checkbox"/> | Twice a week | <input type="checkbox"/> |
| More (specify) | | | |

b. How often do you use cowpea fodder as feed for your livestock?

- | | | | |
|-----------------------|--------------------------|--------------|--------------------------|
| Never | <input type="checkbox"/> | Once a week | <input type="checkbox"/> |
| Less than once a week | <input type="checkbox"/> | Twice a week | <input type="checkbox"/> |
| More (specify) | | | |

16. Which part of cowpea do you use for medicinal purposes?

- | | | | |
|-------|--------------------------|--------|--------------------------|
| Roots | <input type="checkbox"/> | Leaves | <input type="checkbox"/> |
| Seeds | <input type="checkbox"/> | | |

17. For what purposes do you use cowpea medicinally?

.....
.....
.....
.....

D. Cultivation practices

18. How many years have you been actively producing cowpea?

19a. Have you ever received formal training in the cultivation and storage of cowpea?

- Yes No

b. If yes, from whom and when did you receive training?

.....
.....

20a. Are you practicing plant protection? Yes No

b. If yes, what method or type of protection is used?

.....
.....

21a. Are you practicing intercropping with regard to cowpea?

Yes No

b. If yes, please name other crops

.....

22a. Do you rotate your crop with others?

Yes No

b. If yes, what crops?

23. What yield do you get from cowpea?

..... ton or kg per area

..... crates per area (Size of crates:)

..... buckets per area (Size of buckets:)

24. If you are selling your excess produce, please indicate to whom you are selling your produce.

Neighbours Door to door

Local market

Other, please specify

.....

25. What is the average price obtained for the produce sold?

..... R per unit

E. Storage practices

26. Where do you obtain your cowpea seed from?

- | | | | |
|---------------------------|--------------------------|-----------|--------------------------|
| Own | <input type="checkbox"/> | Relatives | <input type="checkbox"/> |
| Neighbours/Friends | <input type="checkbox"/> | Shop | <input type="checkbox"/> |
| Department of Agriculture | <input type="checkbox"/> | | |
| Other..... | | | |

27a. Do you dry your seed prior to storage?

- Yes No

b. If yes, how do you do it?

.....
.....

28a. How do you store your seed?

- | | |
|--|--------------------------|
| Cribs (rooms) made from plant material | <input type="checkbox"/> |
| Clay / earthenware pots | <input type="checkbox"/> |
| Calabashes | <input type="checkbox"/> |
| Tins | <input type="checkbox"/> |
| Miniature silos | <input type="checkbox"/> |
| Other: (please specify) | <input type="checkbox"/> |

.....
.....

b. Photograph of storage structures

Digital camera number:

29. During which month did you last store your seed?

30. For how long has the seed been in storage?

31. What problems do you encounter with the seed during and after storage?

Insects Mouldiness

Other

32a. Do you treat the seed with some type of medium during storage?

Yes No

b. If yes, what do you use?

.....
.....
.....

33. What colour-type of mouldiness occurs on the seed?

White Black

Pink Green

Other

34. Do you encounter any problems with germination of stored seeds?

Yes No

.....
.....

F. Health aspects

35a. Do you or your family members experience any type of ill effects after consuming cowpeas or products thereof?

Yes No

b. If so, what types of symptoms are experienced?

.....

.....
.....

36a. Do your farm animals experience any ill effects after consuming feed made from cowpea?

Yes No

b. If so, what types of symptoms are experienced?

.....
.....
.....

G. Major constraints

37. What are the main problems you encounter in producing cowpeas?

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THANK YOU FOR YOUR INPUT AND CO-OPERATION!

APPENDIX B LIST OF PUBLICATIONS AND PRESENTATIONS

The following publications and presentations at national and international conferences resulted from the research presented in this thesis.

Publications:

Peer-reviewed journals

Kritzinger, Q., Lall, N. and Aveling, T.A.S. 2004. Antimicrobial activity of cowpea (*Vigna unguiculata*) leaf extracts. *South African Journal of Botany* (in press)

Kritzinger, Q., Aveling, T.A.S., Marasas, W.F.O., Rheeder, J.P., van der Westhuizen, L. and Shephard, G.S. 2003. Mycoflora and fumonisin mycotoxins associated with cowpea (*Vigna unguiculata* (L.) Walp) seeds. *Journal of Agricultural and Food Chemistry* 51: 2188-2192.

Published conference proceedings

Kritzinger, Q., Aveling T.A.S., Marasas W.F.O., Rheeder J.P. and van der Westhuizen L. 2004. Occurrence and phytotoxicity of fumonisin B₁ associated with cowpea seed. *Phytopathology* 94: S55

Kritzinger, Q., Aveling, T.A.S. and Van der Merwe, C.F. 2003. Effect of fumonisins on the ultrastructure of cowpea seed. *Microscopy Society of Southern Africa – Proceedings* 33: 64.

Kritzinger, Q., Lall, N. and Aveling, T.A.S. 2003. Antimicrobial properties of cowpea (*Vigna unguiculata* (L.) Walp) leaf extracts. *South African Journal of Botany – Conference abstracts* 69: 224.

Kritzinger, Q., Aveling, T.A.S., Marasas, W.F.O., Shephard, G.S. and Leggott, N. 2002. Detection of fumonisin B₁ in cowpea seed. In: Fatokun CA, Tarawali SA, Singh BB, Kormawa PM, Tamò M (eds) Challenges and opportunities for enhancing sustainable cowpea production. Proceedings of the World Cowpea Conference III held at the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, 4-8 September 2000. IITA, Ibadan, Nigeria. pp. 147-153.

Presentations:

Internationally

- Kritzinger, Q., Aveling T.A.S., Marasas W.F.O., Rheeder J.P. and van der Westhuizen L. 2004. Occurrence and phytotoxicity of fumonisin B₁ associated with cowpea seed. Annual Meeting of The American Phytopathological Society, 31 July – 4 August, Anaheim, California, United States of America. (poster)
- Kritzinger, Q. and Aveling, T.A.S. 2004. Ultrastructural damage and germination reduction in cowpea seeds due to fumonisin B₁. 27th International Seed Testing Association Triennial Congress, 13 – 24 May, Budapest, Hungary. (poster)
- Kritzinger, Q., Aveling, T.A.S., Rheeder, J.P. and van der Westhuizen, L. 2003. Fumonisin production in cowpea by *Fusarium proliferatum*. 8th International Congress of Plant Pathology, 2-7 February, Christchurch, New Zealand. (poster)
- Aveling, T.A.S., Kritzinger, Q., Pakela, Y.P. and Regnier, T. 2003. Seed pathological aspects of cowpea. 8th International Congress of Plant Pathology, 2-7 February, Christchurch, New Zealand. (poster)
- Aveling, T.A.S., Adandonon, A., Kritzinger, Q., Pakela, Y.P., Smith, J.E. and Van Den Berg, N. 2001. Research on cowpea diseases in South Africa. 2nd International Workshop of African Network of Research on Bruchids: Recent Developments in Crop Pre-and Post-harvest Pest Management Practices in Africa, 12-17 November, Cotonou, Republic of Benin. (oral)
- Aveling, T.A.S., Adandonon, A., Kritzinger, Q., Pakela, Y.P., Smith, J.E. and Van den Bergh, N. 2001. Research developments on cowpea diseases in South Africa. Australasian Plant Pathology Society 13th Biennial Conference, September, Cairns, Australia. (oral)
- Kritzinger, Q., Aveling, T.A.S. and Marasas, W.F.O. 2001. Effect of essential plant oils on storage fungi associated with cowpea seeds. 26th International Seed Testing Association Triennial Congress, 14-22 June, Angers, France. (poster)

Kritzinger, Q., Aveling T.A.S. and Marasas, W.F.O. 2001. Contamination of cowpea (*Vigna unguiculata* (L.) Walp) seed by storage fungi and mycotoxins. British Mycological Society International Symposium on Bioactive Fungal Metabolites – Impact and Exploitation, 22- 27 April, Swansea, Wales. (oral)

Nationally

Kritzinger, Q. and Aveling, T.A.S. 2004. Phytotoxicity of fumonisin B₁ to cowpea seeds. 42nd Congress – Southern African Society for Plant Pathology, 18 – 21 January, Cathedral Peak Hotel, Winterton. (oral)

Kritzinger, Q., Aveling, T.A.S. and Van der Merwe, C.F. 2003. Effect of fumonisins on the ultrastructure of cowpea seed. MSSA Conference, 3-5 December, University of Cape Town, Cape Town. (poster)

Kritzinger, Q., Aveling, T.A.S., Marasas, W.F.O., Rheeder, J.P., van der Westhuizen, L. and Shephard, G.S. 2003. Mycoflora and fumonisin mycotoxins associated with cowpea (*Vigna unguiculata* (L.) Walp) seeds. 41st Congress – Southern African Society for Plant Pathology, 19 – 22 January, Baines Game Lodge, Bloemfontein. (oral)

Kritzinger, Q., Lall, N. and Aveling, T.A.S. 2003. Antimicrobial activity of cowpea (*Vigna unguiculata* (L.) Walp) leaf extracts. Joint SAAB/ISE Congress, 7-11 January, University of Pretoria, Pretoria. (poster)