

KWAZULU-NATAL

All the KwaZulu-Natal projects were cultivar trials and training and were outsourced to TN. Project Management Services. They planted seven trials across the region and these are their reports.

PROJECT TITLE: LADYSMITH CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE

Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in summer under irrigation.

- OBJECTIVES**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
 - (ii) To develop a simple and affordable (input) package for resource farmers.
 - (iii) To demonstrate good production practices to small-scale Growers and transfer of technology.

Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the farrows were opened by hand using hoes. Five (5) cultivars of potato tuber seeds were hand-planted on a

small-scale farmer's land on 19 September 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Ronn, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 775kg/ha and KCL (Potassium) at 440kg/ha was applied at planting. Pre-emergence herbicides (Dual and Sencor) were applied after planting and after ridging weed control was done by hand hoeing. Top dressing with LAN at a rate of 362.5kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot were harvested.

Observation

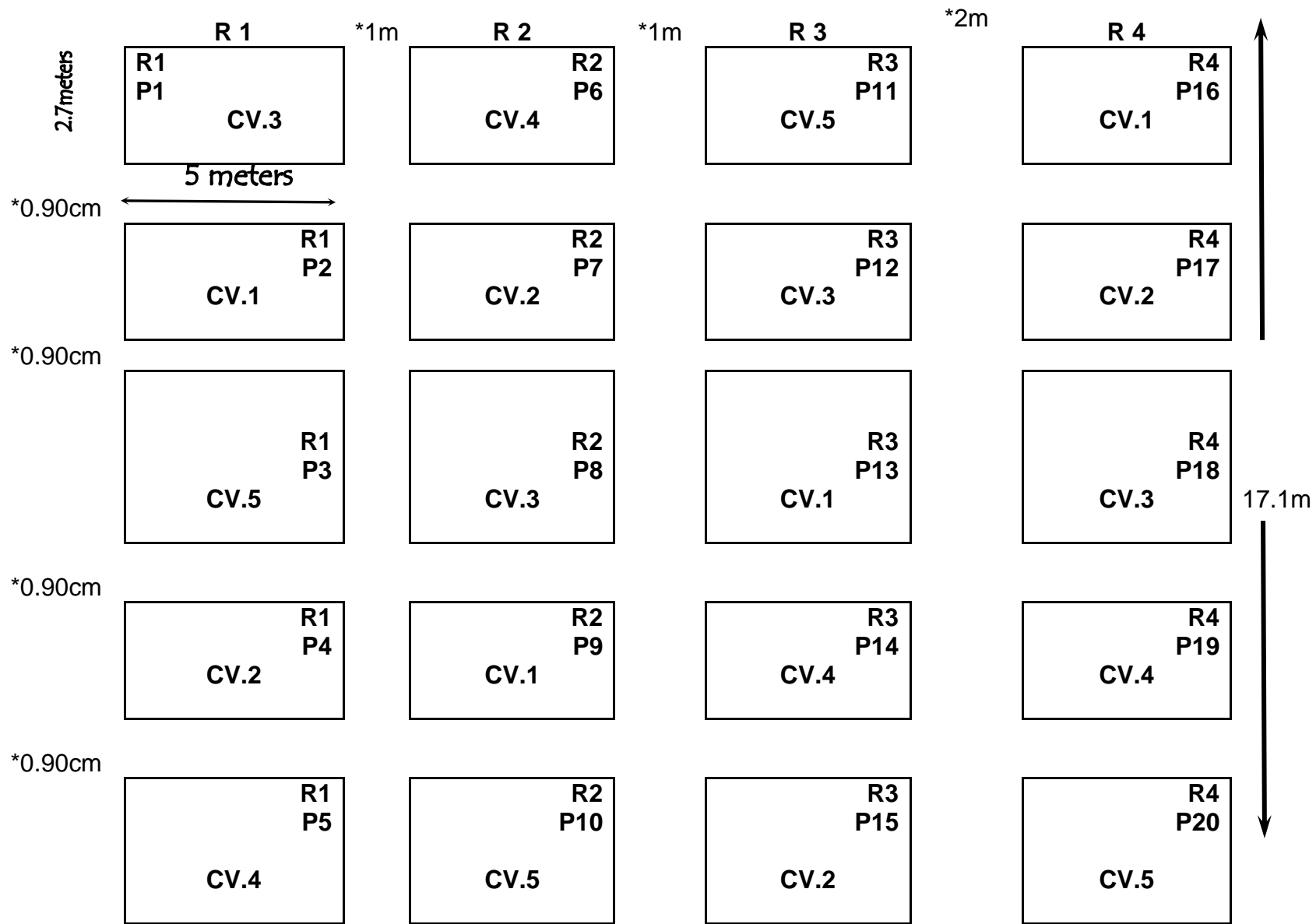
The following data was recorded:

Growing period: (1) 75% plant emergence
 (2) 75% foliage die-back

Number of plants after emergence for each replicate secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

**Potato Cultivar Project
Field Plan**



Key

CV = Cultivar
R = Replicate
P = Plot
* = Pathway

Plot size

Length = 10mts
width = 2.7mts =
4 rows @ .90cm
apart Tuber
Spacing 30cm
apart

Cultivars = 5

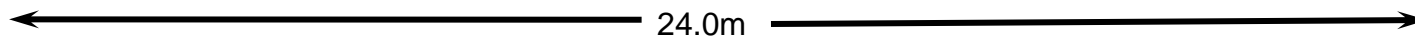
CV.1.MNANDI
CV.2.RONN
CV.3.BP-1

CV.4.CALIBRA
CV.5.ASTRID

Rep 1 + Rep 2
+Rep 3

will be sprayed

Rep 4 will be
unsprayed



Results

Cultivar	Date of emergence	Plant Count			Growth Vigour	Late Blight	Early Blight	Die-back Dates	Secondary Growth	Tuber shape	Eye depth	Fusarium Dry-rot	Common scab	Root knot	Hollow Heart	internal Appearance	Flesh colour	R1/R2/R3 Mean yield in Ton/Ha	R4 unsprayed Yield in Ton/Ha
		R1	R2	R3															
MNANI	29/09/0	34	34	33	3	5	4	23/02/0	4	3	3	5	5	5	5	2	2	18.0	15.0
Ronn	29/09/0	33	33	33	3	5	4	23/02/0	4	3	3	5	5	5	5	2	3	20.0	10.0
BP 1	29/09/0	28	33	33	3	4	3	23/02/0	4	3	3	5	4	5	5	2	3	15.0	11.0
CALIBI	29/09/0	32	34	32	3	4	4	23/02/0	3	4	3	5	5	5	5	2	3	18.0	16.0
ASTRII	29/09/0	33	34	34	2	5	4	23/02/0	4	3	3	5	4	5	5	2	2	21.0	17.0

KEY: 5 is no infection and 1 is severe infection

The Ladysmith project emergence was good. The germination was 100%. The Ladysmith project was a disaster from the beginning, because of no irrigation, and very low rainfall in the area. On our first visit, we were promised that there will be plenty of water from the borehole, and the trial will be managed properly. Due to unforeseen circumstances the engine for the borehole did not work, so they relied on the rainfall which was very poor. Joyce Gumede did not get help from any of the other committee members, and she has a financial problem, therefore the engine could not be fixed. Next season we need to propose a new site where irrigation is already available.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed. Potatoes South Africa decided that the farmers need help, so we took the

knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars.

Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed. Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the losses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and more community involvement and the committee that represents Potatoes South Africa. The people that are appointed on the committee, needs people that are well known by the community as well as people that are committed and within a radius of 50km from the area.

Most of the projects had only one committee member with little help or interest from the community and irrigation was a major problem. My suggestion is to move the potato projects to community gardens where there is irrigation already available and more community involvement and more committees

PROJECT TITLE: PORT SHEPSTONE CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE : Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in winter under irrigation.

- OBJECTIVES**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
 - (ii) To develop a simple and affordable (input) package for resource farmers.
 - (iv) To demonstrate good production practices to small-scale Growers and transfer of technology.

Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened by hand using hoes. Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 15 June 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Hertha, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 500kg/ha and KCL (Potassium) at 690kg/ha was applied at planting, half on the KCL (Potassium) was applied before disking and the other half at planting. Pre-emergence herbicides (Dual and Sencor) were applied after planting and after ridging weed control was done by hand hoeing. Top dressing LAN at a rate of 550kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot were harvested.

Observation

The following data was recorded:

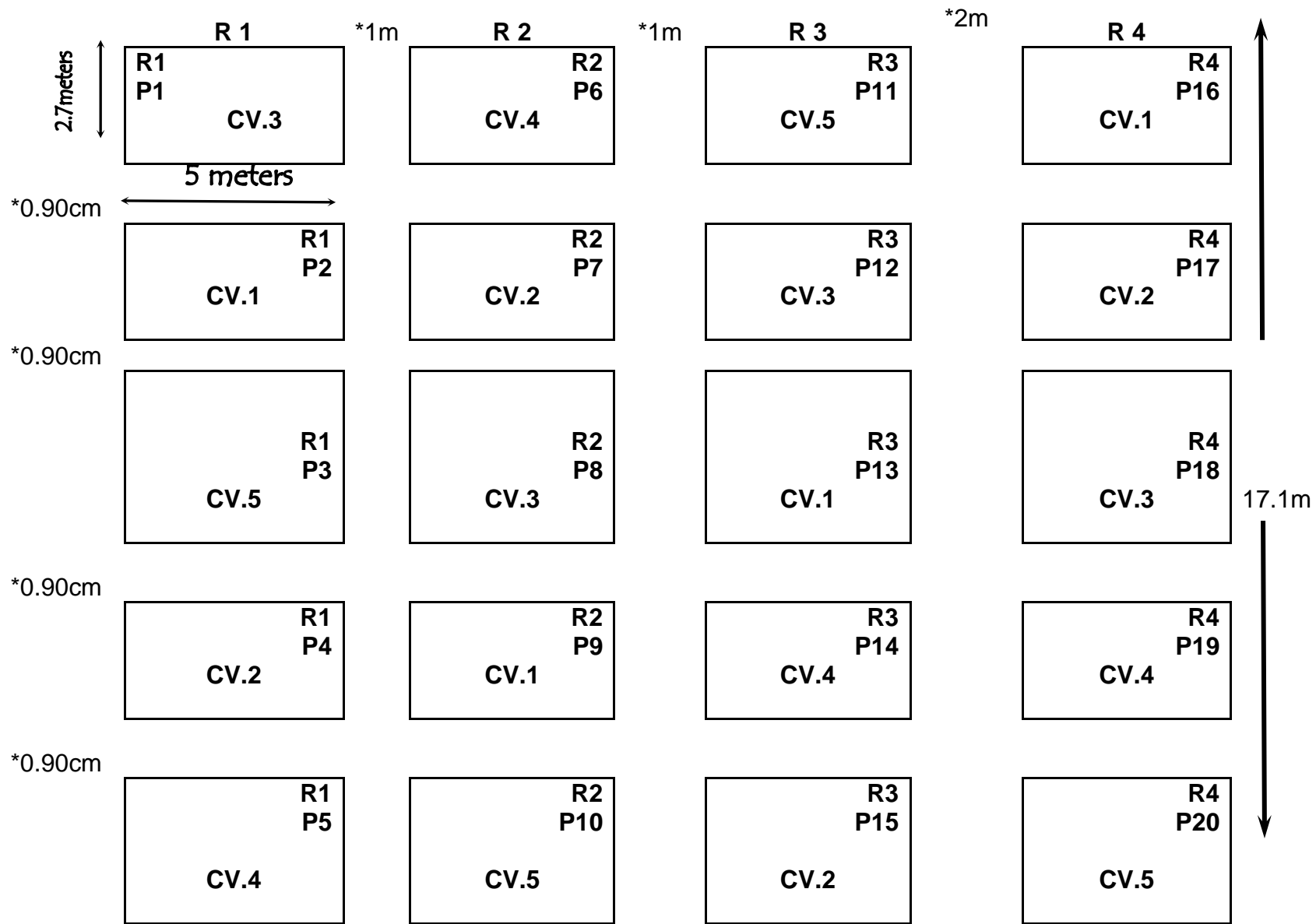
Growing period : (1) 75% plant emergence
 (2) 75% foliage die-back

Number of plants after emergence for each replicate

Secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

**Potato Cultivar Project
Field Plan**



Key

- CV = Cultivar
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- P = Plot
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Plot size

Length = 10mts
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4 rows @ .90cm
apart Tuber
Spacing 30cm
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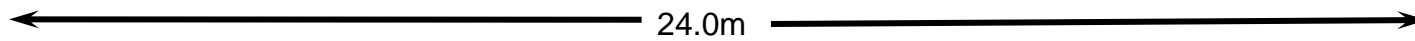
Cultivars = 5

- CV.1.MNANDI
- CV.2.HERTHA
- CV.3.BP-1
- CV.4.CALIBRA
- CV.5.ASTRID

Rep 1 + Rep 2
+Rep 3

will be sprayed

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Results

Cultivar	Date of emergence	Plant Count			Growth Vigour	Late Blight	Early Blight	Die-back Dates	Secondary Growth	Tuber shape	Eye depth	Fusarium Dry-rot	Common scab	Root knot	Hollow Heart	Internal Appearance	Flesh colour	R1/R2/R3 Mean yield in Ton/Ha	R4 unsprayed Yield in Ton/Ha
		R1	R2	R3															
MNANI	05/07/0	32	34	33	4	5	4	20/10/0	5	3	3	5	4	5	5	2	2	8.4	11.0
HERTH	05/07/0	33	31	33	4	4	4	20/10/0	4	3	3	5	5	5	5	2	1	13.0	11.0
BP 1	07/07/0	34	33	34	4	4	3	20/10/0	5	3	3	5	4	5	5	2	3	19.6	17.0
CALIBI	10/07/0	31	33	32	3	4	4	20/10/0	4	3	3	5	5	5	5	2	3	4.3	9.0
ASTRID	14/07/0	29	29	29	3	5	5	20/10/0	5	3	3	5	5	5	5	2	2	22.3	27.00

KEY: 5 is no infection and 1 is severe infection.

The Portshepstone project had poor attendance from the members and the community. The trial was not irrigated properly and the trial was left with weeds at the end. The germination was good, besides Astrid that emerged late, but performed well at the end with the highest yield. No member was present when the project was harvested. The project will be moved to another site next season, preferably a community garden where there will be more committed members and a good irrigation system. These trials need to be visited more often to eliminate some of the management problems.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed.

Potatoes South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars.

Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed.

Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the losses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and more community involvement and the committee that represents Potato South Africa. The people that are appointed on the committee needs to be people that are well known by the community as well as people that are committed and within a radius of 50km from the area.

This season due to the availability of finance the potato projects were planted late and there was a communication breakdown with the committee that was chosen for the different areas. Most of the projects had only one committee member with little help or interest from the community and irrigation was a major problem. Due to this the yields of these projects are very low these problems have shown that this season was a learning curve for the committee members and the farmers. My suggestion is to move the potato projects to community gardens where there is irrigation already available and more community involvement and more committee members.

PROJECT TITLE: IXOPO/ HIGHFLATS- AMAZABEKO CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE : Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in summer under irrigation.

- OBJECTIVES:**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
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Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened by hand using hoes. Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 22 September 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Ronn, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 400kg/ha and KCL (Potassium) at 670kg/ha was applied at planting. Pre-emergence herbicides (Dual and Sencor) were applied after planting and after ridging weed control was done by hand hoeing. Top dressing with LAN at a rate of 600kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the

recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot were harvested.

Observation

The following data was recorded:

Growing period: (1) 75% plant emergence

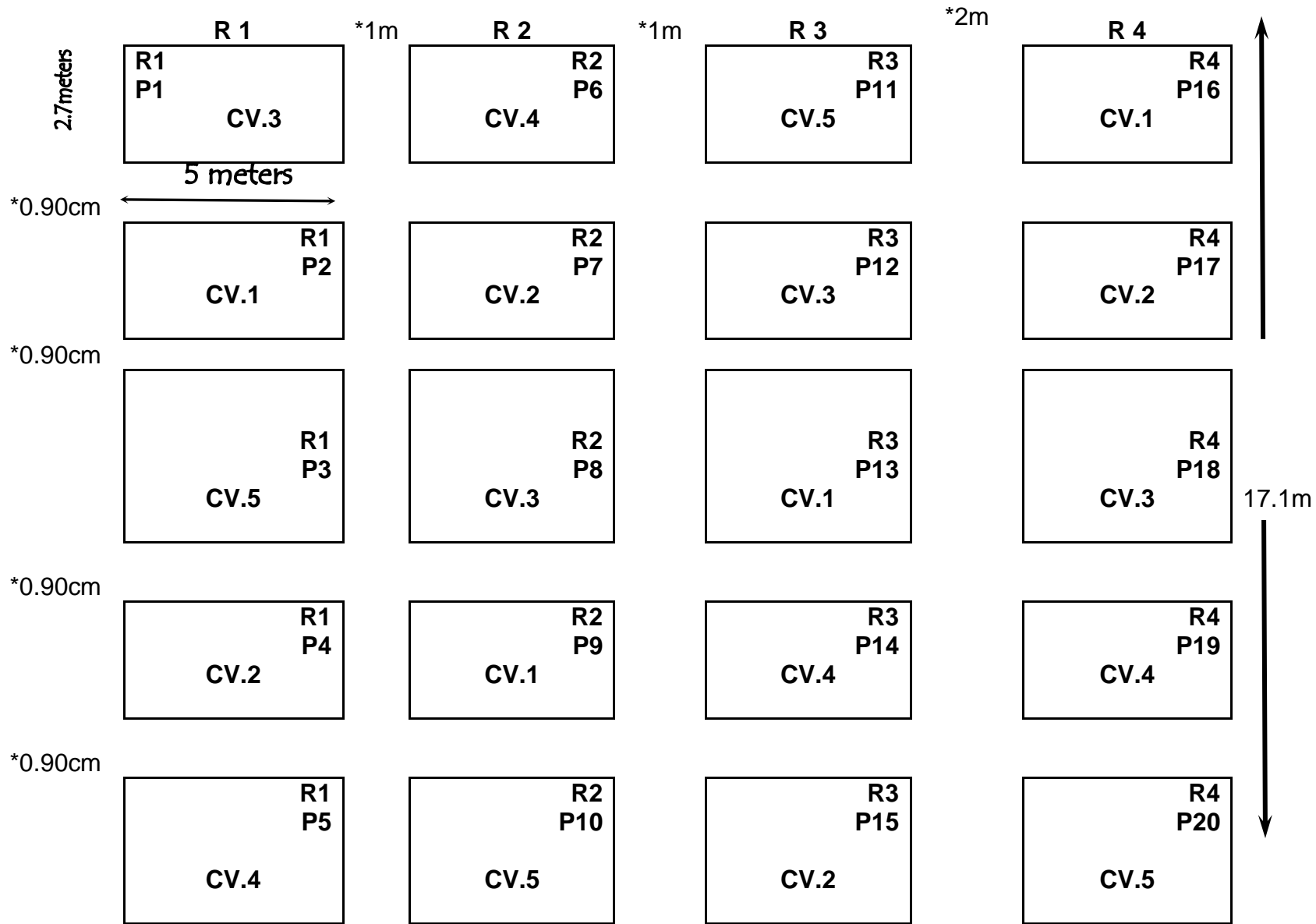
(2) 75% foliage die-back

Number of plants after emergence for each replicate

Secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

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Field Plan**



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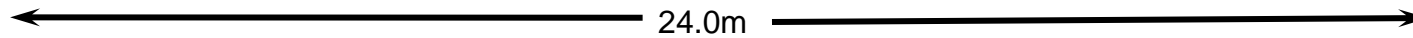
Plot size

Length = 10mts
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4 rows @ .90cm
apart Tuber
Spacing 30cm
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Cultivars = 5

- CV.1.MNANDI
- CV.2.RONN
- CV.3.BP-1
- CV.4.CALIBRA
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Rep 1 + Rep 2
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will be sprayed
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Results

Cultivar	Date of emergence	Plant Count			Growth Vigour	Late Blight	Early Blight	Die-back Dates	Secondary Growth	Tuber shape	Eye depth	Fusarium Dry-rot	Common scab	Root knot	Hollow Heart	Internal Appearance	Flesh colour	R1/R2/R3 Mean yield in Ton/Ha	R4 unsprayed Yield in Ton/Ha
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RONN	07/10/0	34	34	34	4	5	4	26/01/0	4	3	3	5	5	4	5	2	3	33.3	28.0
BP 1	05/10/0	34	34	34	4	4	4	30/01/0	4	3	3	5	4	4	5	2	3	30.0	26.0
CALIB	09/10/0	34	34	34	4	4	4	20/01/0	4	4	3	5	5	5	5	2	3	25.0	22.0
ASTRI	07/10/0	34	34	34	4	5	4	20/01/0	4	3	3	5	4	5	5	2	2	35.0	30.0

KEY: 5 is no infection and 1 is severe infection

The Ixopo / Highflats project emergence was good. The germination was 100%. The cultivars grew very well due to the good irrigation management and good rainfall. There were lots of rotten tubers that were due to the heavy rainfall and humid temperatures, as well as mould damage. The project obtained high yields, and this was due to good management skills by T.C. Dlamini.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed. Potato South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, and fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage.

Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

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Most of the projects had only one committee member with little or no help from the community. Since Mr.T.C Dlamini has managed the trial in a very responsible manner,

PROJECT TITLE: EMPANGENI- PHEZUKOMKHONO CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services)

BEGIN DATE: July 2006

END DATE: Evaluate annually

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Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project , soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened with a potato ridger using a tractor.

Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 30 May 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Hertha, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 700kg/ha and KCL (Potassium) at 230kg/ha was applied at planting. Pre-emergence herbicides (Dual and Sencor) was applied after planting and after ridging weed control was done by hand hoeing. Top dressing (LAN at a rate of 425kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot was harvested.

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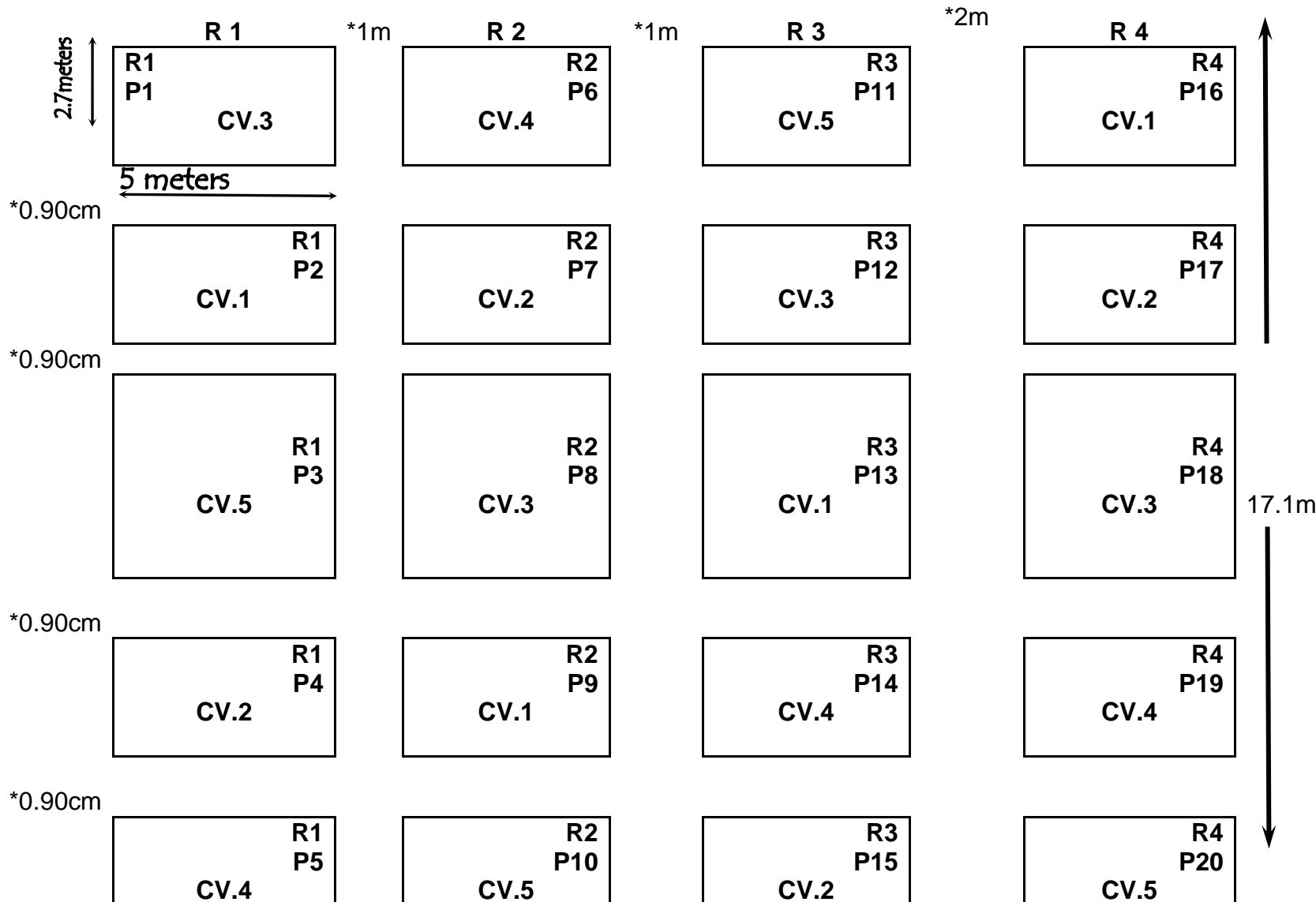
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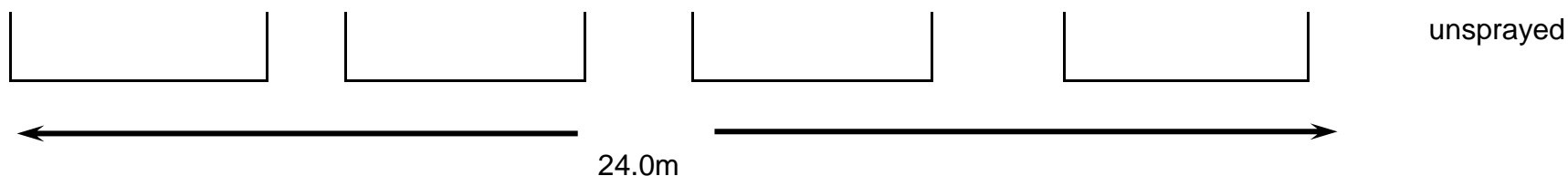
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Rep 1 + Rep 2
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Results

Cultivar	Date of emergence	Plant Count			Grow Vigour	Late Blight	Early Blight	Die-back Dates	Second Growth	Tuber shape	Eye depth	Fusarium Dry-rot	Common scab	Root knot Eel-wo	Hollow Heart	External Appearance	Flesh colour	R1/R2/R3 Mean yield in Ton/Ha	R4 unsprayed Yield in Ton/Ha
		R1	R2	R3															
MNANDI	24/06/0	34	34	34	4	5	4	02/10	5	3	3	5	5	5	5	2	2	24.0	13.0
HERTHA	15/06/0	31	34	34	4	5	4	28/09	5	3	3	5	5	5	5	2	1	26.0	15.0
BP 1	20/06/0	34	34	34	4	5	4	30/09	5	3	3	5	5	5	5	2	3	30.0	25.0
CALIBRA	29/06/0	34	33	34	4	5	4	04/10	5	4	3	5	5	5	5	2	3	20.0	16.0
ASTRID	04/07/0	25	27	24	3	5	4	12/10	4	3	3	5	5	5	5	2	2	23.0	18.0

KEY: 5 is no infection and 1 is severe infection.

The project at Empangeni was planted and irrigated for a few weeks thereafter the pump was damaged and cannot be fixed. The project was not irrigated for about two months. The Empangeni project as performed better due to the little irrigation that was applied in the beginning. The highest yield was BP 1 (30 Ton/ Ha) followed by HERTHA (26 Ton/Ha) then MNANDI (24 ton/Ha), ASTRID (23 Ton/Ha), CALIBRA (20 Ton/Ha). The results have shown that the medium and long season cultivars did not grow to its full term due to the shortage of water. The project will be continued and evaluated after a three year period.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed.

Potato South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, and fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars.

Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed.

Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the losses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and more community involvement and the committee that represents Potato South Africa. The people that are appointed on the committee needs to be people that are well known by the community as well as people that are committed and within a radius of 50km from the area.

This season due to the availability of finance the potato projects were planted late and there was a communication breakdown with the committee that was chosen for the different areas. Most of the projects had only one committee member with little help or interest from the community and irrigation was a major problem. Due to this the yields of these projects are very low these problems have shown that this season was a learning curve for the committee members and the farmers. My suggestion is to move the potato projects to community gardens where there is irrigation already available and more community involvement and more committee members.

PROJECT TITLE: MANGUZI CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE : Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in winter under irrigation.

- OBJECTIVES:**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
 - (ii) To develop a simple and affordable (input) package for resource farmers.
 - (vii) To demonstrate good production practices to small-scale Growers and transfer of technology.

Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened by hand using hoes.

Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 15 June 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Hertha, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 500kg/ha and KCL (Potassium) at 1120kg/ha was applied at planting, half on the KCL (Potassium) was applied before disking and the other half at planting. Pre-emergence herbicides (Dual and Sencor) was applied after planting and after ridging weed control was done by hand hoeing.

Top dressing LAN at a rate of 550kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot was harvested.

Observation

The following data was recorded:

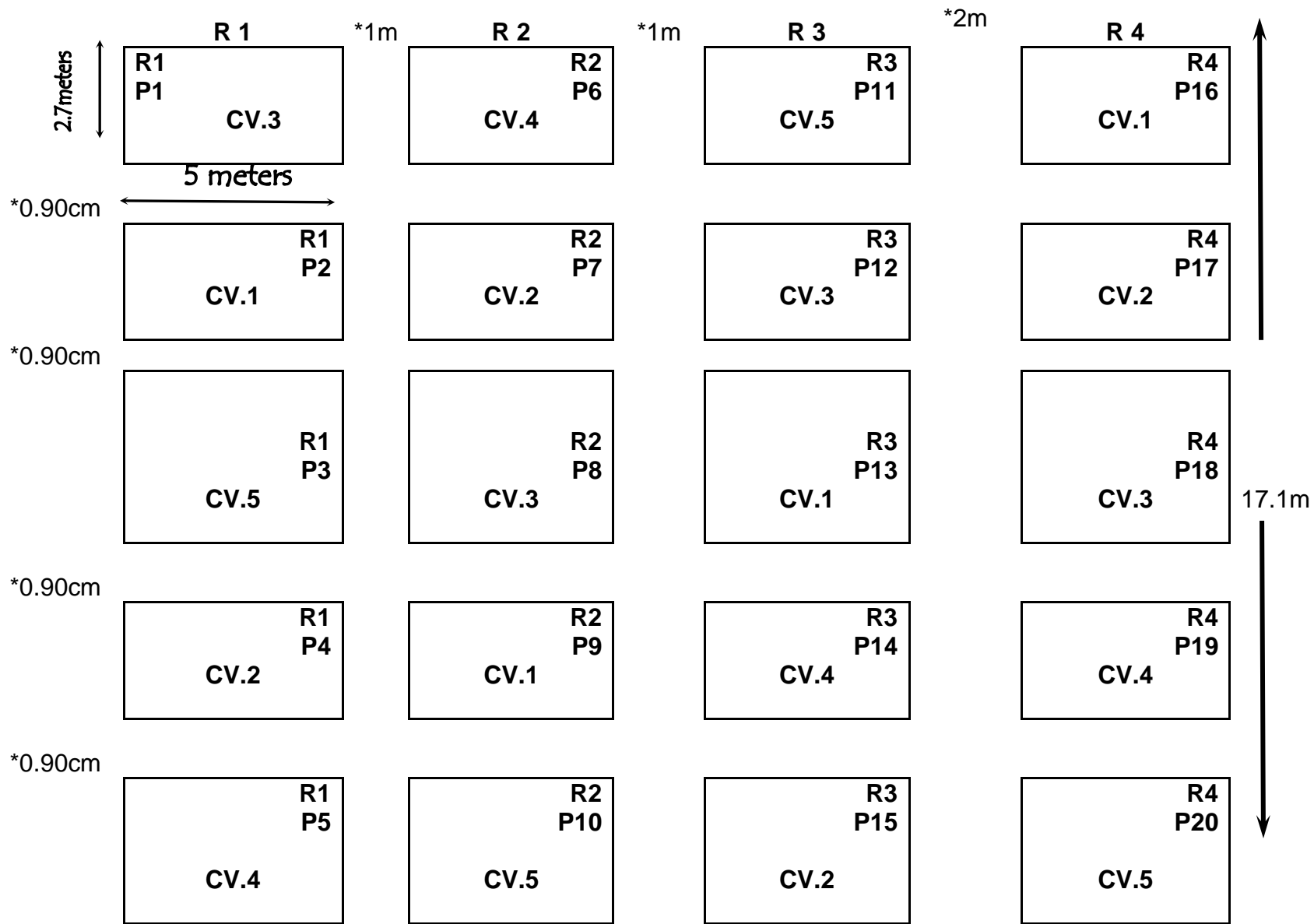
Growing period : (1) 75% plant emergence
 (2) 75% foliage die-back

Number of plants after emergence for each replicate

Secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

**Potato Cultivar Project
Field Plan**



Key

CV = Cultivar
R = Replicate
P = Plot
* = Pathway

Plot size

Length = 10mts
width = 2.7mts =
4 rows @ .90cm
apart Tuber
Spacing 30cm
apart

Cultivars = 5

CV.1.MNANDI
CV.2.HERTHA
CV.3.BP-1

CV.4.CALIBRA
CV.5.ASTRID

Rep 1 + Rep 2
+Rep 3

will be sprayed

Rep 4 will be
unsprayed



Results

Cultivars	Date of emergence	Plant Count			Grow Vigou	Late Blight	Early Blight	Die-back Dates	Second Growth	Tuber shape	Eye dept	Fusari Dry-ro	Comm scab	Root kn Eel-wor	Hollow Heart	internal Appearance	Flesh colour	R1/R2/R3 Mean yi in Ton/H	R4 unsprayed Yield in Ton/Ha
		R1/R2/R3																	
MNANDI	06/07/06	32	33	34	4	5	4	30/10/06	4	3	3	5	4	5	5	2	2	8.6	4.4
HERTHA	01/07/06	31	29	31	4	5	4	30/10/06	4	3	3	5	5	5	5	2	1	8.2	10.0
BP 1	06/07/06	34	34	34	4	4	4	30/10/06	4	3	3	5	4	5	5	2	3	16.0	11.7
CALIBRA	06/07/06	33	32	31	4	5	4	30/10/06	3	4	3	5	5	5	5	2	3	5.6	4.0
ASTRID	10/07/06	25	22	28	3	5	4	30/10/06	3	3	3	5	5	5	5	2	2	12.0	11.00

KEY: 5 is no infection and 1 is severe infection.

The Manguzi project was not irrigated, due to no irrigation pipes. The germination was good, due to lack of moisture, the yields were very low. The municipality promised to put out the irrigation pipes, but did not. The project members were about 20 youths when we started, but at the end there was only one member. The project was a learning curve for the youth as well as me, in the future the sites that are chosen needs to be well established, by this I mean committed members and were irrigation is available. This project will be moved to Mkuzi.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed.

Potato South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale

farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars. Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed.

Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the loses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and more community involvement and the committee that represents Potato South Africa. The people that are appointed on the committee needs to be people that are well known by the community as well as people that are committed and within a radius of 50km from the area.

This season due to the availability of finance the potato projects were planted late and there was a communication breakdown with the committee that was chosen for the different areas. Most of the projects had only one committee member with little help or interest from the community and irrigation was a major problem. Due to this the yields of these projects are very low these problems have shown that this season was a learning curve for the committee members and the farmers. My suggestion is to move the potato projects to community gardens where there is irrigation already available and more community involvement and more committee members.

PROJECT TITLE: WARTBURG CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE : Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in summer under irrigation.

- OBJECTIVES:**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
 - (ii) To develop a simple and affordable (input) package for resource farmers.
 - (viii) To demonstrate good production practices to small-scale Growers and transfer of technology.

Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened by hand using hoes.

Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 18 September 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Ronn, Mhandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 480kg/ha and KCL (Potassium) at 540kg/ha was applied at planting. Pre-emergence herbicides (Dual and Sencor) was applied after planting and after ridging weed control was done by hand hoeing. Top dressing with LAN at a rate of 600kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot was harvested.

Observation

The following data was recorded:

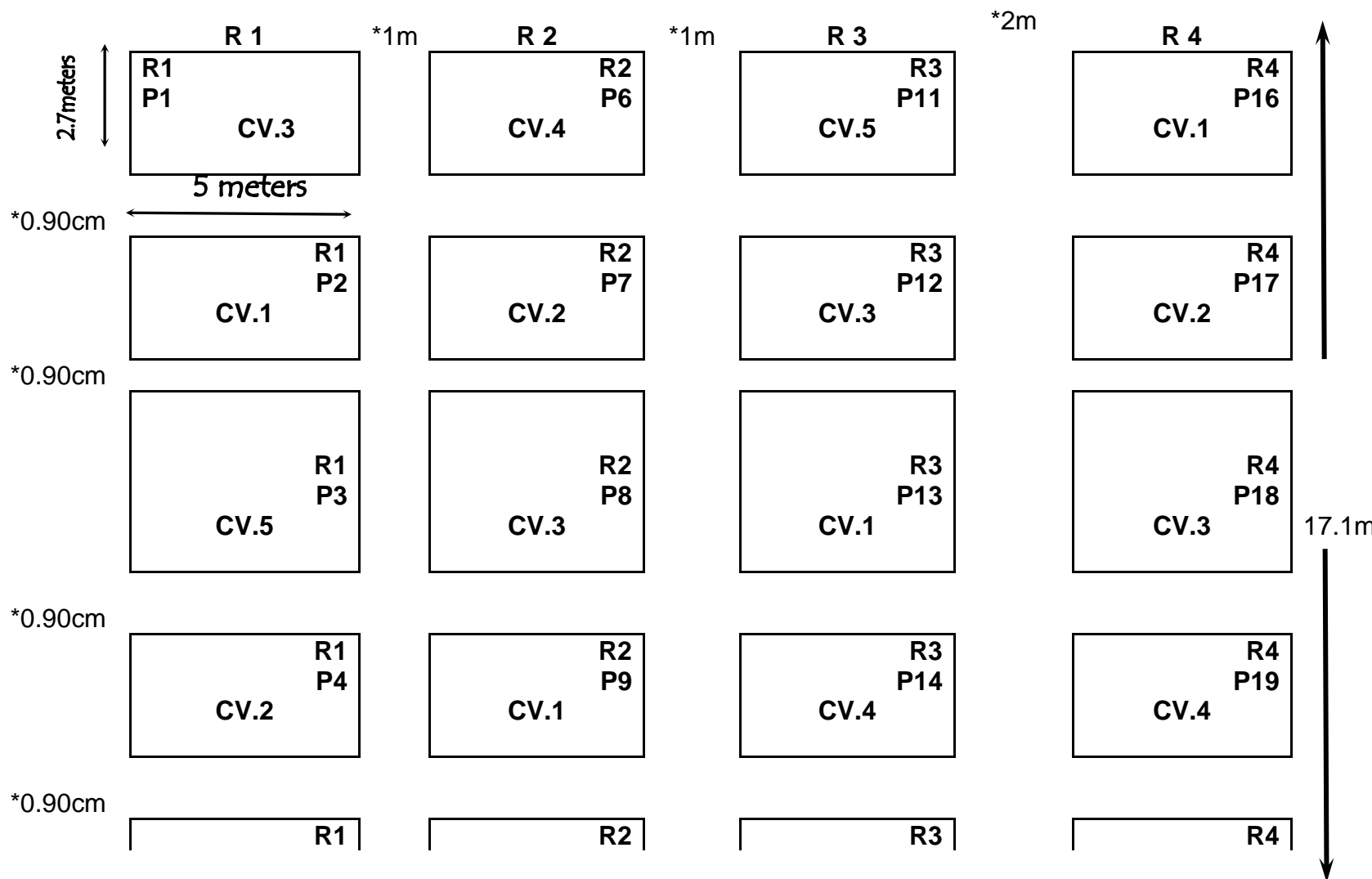
Growing period: (1) 75% plant emergence
(2) 75% foliage die-back

Number of plants after emergence for each replicate

Secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

**Potato Cultivar Project
Field Plan**



Key

- CV = Cultivar
- R = Replication
- P = Plot
- * = Pathwidth

Plot size

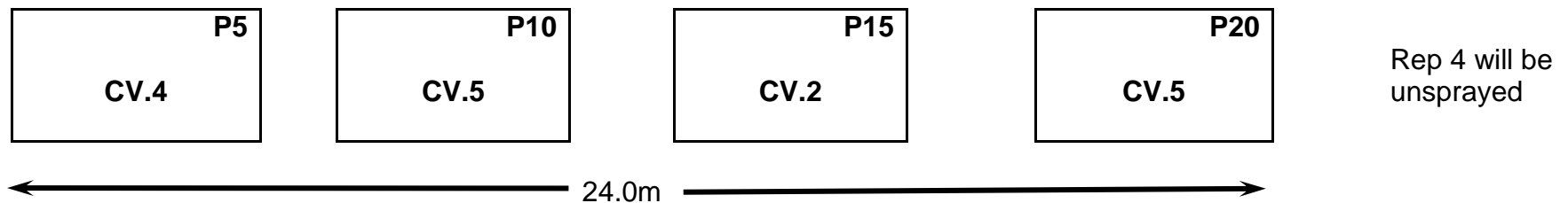
Length = 10m
width = 2.7mts
4 rows @ .90cm
apart Tuber
Spacing 30cm
apart

Cultivars = 5

CV.1.MNANDI
CV.2.RONN
CV.3.BP-1

CV.4.CALIBRA
CV.5.ASTRID

Rep 1 + Rep 2
+Rep 3
will be sprayed



Results

Cultivar	Date of emergence	Plant Count			Growt Vigou	Late Bligh	Early Bligh	Die-back Dates	Secor y Growt	Tube shape	Eye depth	Fusa m Dry-	Comm scab	Root kn Eel-wor	Hollow Heart	internal Appearance	Flesh colour	R1/R2/R3 Mean yi in Ton/H	R4 unspra Yield in Ton/H
		R1	/R2	R3															
MNANI	29/09/0	34	34	34	4	5	4	22/02/0	4	3	3	5	5	5	5	2	2	43.0	38.8
Ronn	29/09/0	34	34	34	4	5	4	22/02/0	4	3	3	5	5	5	5	2	1	33.0	25.0
BP 1	29/09/0	32	34	34	4	4	4	22/02/0	4	3	3	5	5	5	5	2	3	38.8	30.0
CALIBI	29/09/0	34	34	34	4	4	4	22/02/0	3	4	3	5	5	5	5	2	3	26.6	20.0
ASTRII	29/09/0	34	34	34	4	5	4	22/02/0	4	3	3	5	5	5	5	2	2	28.0	25.0

KEY: 5 is no infection and 1 is severe infection

The Wartburg project emergence was good due to good rains. The germination was 100%. The project members were about 15 when we started, but at the end there was only three members. The project was another learning curve for the members as well as me, in the future the sites that are chosen needs to be well established, by this I mean committed members and were irrigation is available

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed. Potato South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars.

Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed.

Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the loses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and

more community involvement and the committee that represents Potato South Africa. The people that are appointed on the committee, needs people that are well known by the community as well as people that are committed and within a radius of 50km from the area.

Most of the projects had only one committee member with little help or interest from the community and irrigation was a major problem. . My suggestion is to move the potato projects to community gardens where there is irrigation already available and more community involvement and more committee.

PROJECT TITLE: NEWCASTLE CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: T N Project Management Services

BEGIN DATE: July 2006

END DATE: Evaluate annually

TITLE : Comparative field performance and disease resistance of Potato cultivars grown in different production environments in KwaZulu-Natal for small-scale farmers in summer under irrigation.

- OBJECTIVES:**
- (i) To evaluate cultivars for agronomics performance under low input conditions.
 - (ii) To develop a simple and affordable (input) package for resource farmers.
 - (ix) To demonstrate good production practices to small-scale Growers and transfer of technology.

Summary of Project Procedures

On the first visit the purpose of the project was explained to the small scale farmers, the land was allocated for the project, soil sample was taken and the land was sprayed with herbicide (Roundup) to kill off weeds. Two weeks later the land was ploughed and disked and on the day of planting the furrows were opened by hand using hoes. Five (5) cultivars of potato tuber seeds were hand-planted on a small-scale farmer's land on 20 September 2006. The cultivars planted in this project were particularly selected for their moderate to high field resistance to foliar diseases (early and late blight and viruses) and tuber diseases (scab). These cultivars include: Astrid, Calibra, Ronn, Mnandi and BP1. The project was planted in a randomized block design with 4 replicates under irrigation. The plots consisted of 4 rows 5 meter long with an inter-row spacing of 90cm and an intra-row spacing of 30cm. A basal fertilizer dressing of DAP at the rate of 575kg/ha and KCL (Potassium) at 500kg/ha was applied at planting. Pre-emergence herbicides (Dual and Sencor) was applied after planting and after ridging weed control was done by hand hoeing. Top dressing with LAN at a rate of 487.5kg/ha and final ridging was done. Only 3 reps were sprayed with fungicides (Bravo and Dithane m45) and insecticide (Cypermethrine) applied at the recommended rates after planting to control early and late blight diseases as well as insects. The crop was harvested after foliage die-back. Only 2 rows of each plot was harvested.

Observation

The following data was recorded:

Growing period: (1) 75% plant emergence

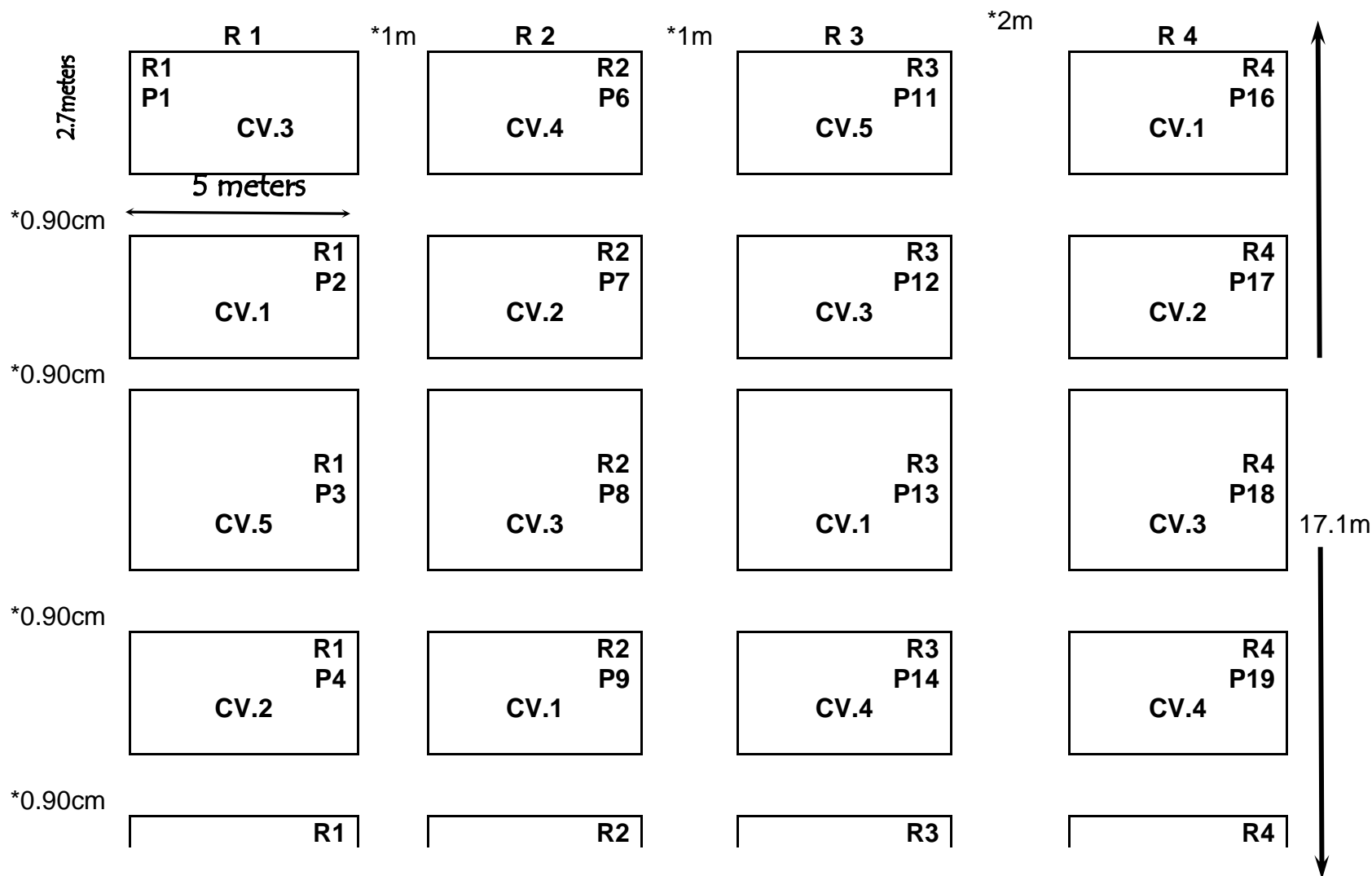
(2) 75% foliage die-back

Number of plants after emergence for each replicate

Secondary growth, Tuber shape, Eye depth, Fusarium dry-rot and Stem end-rot, Late blight, Early blight, Common scab and Root Knot Eelworm.

Evaluation of internal properties of the Tuber: Hollow Heart, Internal appearance and Flesh colour .Grading and sorting of potato tubers in four (4) different sizes (Large >250 Medium 100-250 Small 50-100 and unmarketable) and weighting.

**Potato Cultivar Project
Field Plan**



Key

- CV = Cultivar
- R = Replication
- P = Plot
- * = Pathway

Plot size

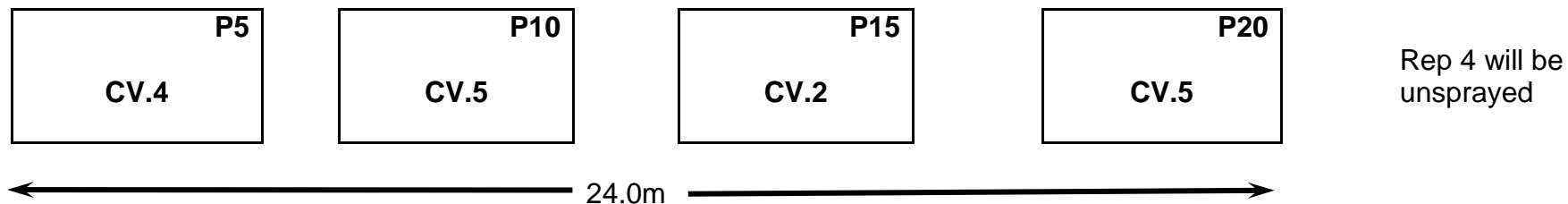
Length = 10m
width = 2.7mts
4 rows @ .90cm
apart Tuber
Spacing 30cm
apart

Cultivars = 5

CV.1.MNANDI
CV.2.RONN
CV.3.BP-1

CV.4.CALIBRA
CV.5.ASTRID

Rep 1 + Rep 2
+Rep 3
will be sprayed



Results

Cultivar	Date of emergence	Plant Count			Growth Vigour	Late Blight	Early Blight	Die-back Dates	Secondary Growth	Tuber shape	Eye depth	Fusarium Dry-rot	Common scab	Root knot	Hollow Heart	internal Appearance	Flesh colour	R1/R2/R3 Mean yield in Ton/Ha	R4 unsprayed Yield in Ton/Ha
		R1	R2	R3															
MNANI	08/10/06	34	34	34	4	5	4	23/03/06	3	3	3	5	4	2	5	2	2	45.0	20.0
Ronn	08/10/06	34	34	33	4	4	3	23/03/06	3	3	3	5	3	2	5	2	3	50.0	22.0
BP 1	08/10/06	34	34	34	4	4	3	23/03/06	3	3	3	5	4	2	5	2	3	45.0	18.0
CALIBI	08/10/06	34	34	34	4	4	4	23/03/06	3	4	3	5	3	2	5	2	3	40.0	20.4
ASTRI	08/10/06	34	34	33	4	5	4	23/03/06	3	3	3	5	4	2	5	2	2	48.0	22.3

KEY: 5 is no infection and 1 is severe infection

The Newcastle project emergence was good. The germination was 100%. The Newcastle project was growing well from the beginning, because of good rainfall. Due to the good rainfall, it was unfortunate, on the 8 of December 2006 there was a heavy hail storm in Newcastle which damaged about 50% of the potato crop foliage.

Due to the set back by the hail storm, the potato crop had a lot of regrowth, during this period the rainfall was low and the irrigation was insufficient, so the plant suffered moisture stress and had to go on growing for a longer period.

Conclusion

For a number of years small-scale farmers have been planting potato cultivars without the knowledge of potato production methods, cultivars available and seed certification. They planted seed that was sold by the shops and local farmers, which was not Government certified and as a result they planted diseased potato seed.

Potato South Africa decided that the farmers need help, so we took the knowledge to the farmers by conducting research projects with them, teaching them the importance of soil sampling, herbicides for weed control, land preparation, cultivar choice, fertilization, fungicides for disease control, insecticide for insect control, the importance of irrigation, topdressing, ridging, harvesting and storage. Small scale farmers have limited funds, so they do not always have the equipment, such as a tractor, other implements and sprayers as well as the chemicals to control weeds, diseases and pests which are costly. Some of the disease resistant cultivars bred by the Agricultural Research Council are well suited for small-scale farmers which were used in these potato projects.

The benefit of these projects to the farmers are, hands-on practical knowledge of soil sampling, weed control, land preparation, fertilizing, planting, knowledge of new potato cultivars, which are disease resistant, availability of Government certified seed potato cultivars, high yielding cultivars, the control of fungal diseases and pests, top dressing and ridging at the right time, the importance of ridging and harvesting at the right time, as well as storage of table and seed potato. These projects are conducted on community lands which are close to the small-scale farmers to have easy access to the projects on a day to day basis and so that they can gain a good of the growth habits and the disease resistance of the different cultivars.

Every three (3) years we will include new cultivars in the project so that farmers can compare them with old cultivars and get to know the new cultivars that are available, so that they will have good knowledge of potato cultivars and use this information when purchasing potato seed. Working with small-scale farmers is difficult, because they lack management skills and they need to be monitored on a day to day basis, they also need to know the importance of irrigation when planting potato for profit and the losses that occur when planting under dry land conditions. Frequent visits to these potato projects will correct some of these problems and more community involvement and the committee that represents Potato South Africa.

The people that are appointed on the committee, needs people that are well known by the community as well as people that are committed and within a radius of 50km from the area. The Newcastle committee members were involved in the project from the first day right to the end, they were always available during the duration of the project and are very keen to learn, and irrigation was a major problem.

Lesson Learnt

- 1.) Goods irrigation must be available before projects commence.
- 2.) Eelworm is a major problem with small scale farmers when planting potato.
- 3.) Lack of management skill.
- 4.) Single small scale farmers plant a small area which is form half a hector to one hector, they do not have the management skills and equipment to manage a larger area.
- 5.) When they are grouped together in one area they produce more than ten hectors of potatoes.
- 6.) Transport is a major problem for small scale farmers.
- 7.) A lot of the small scale farmers planted potato this season, but complained about marketing.

NORTH EASTERN CAPE

PROJECT TITLE: ENGQOBO CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: Louis Pretorius

BEGIN DATE: July 2006

END DATE: JUNE 2009

START DATE: JULY 2006

SUMMARY

Planting date: September 2006

Harvesting date: February 2007

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were trialed under irrigation in Ngqobo KwaZulu Natal. The cultivar Mondial obtained the highest yield and was significantly higher than all the other cultivars, except for Mnandi and Astrid. Calibra, Bp1, Astrid and Mnandi fell into the lowest yielding group and did not differ significantly from each other. The cultivars Mondial, Mnandi and Astrid obtained higher yields than the trial average (17.24 ton/ha).

OBJECTIVES 2004/2005

Cultivar trials are done to compare new with commercial cultivars in all the potato producing areas of South Africa. This trial was done in Ngqobo KwaZulu Natal.

Introduction, Materials and Methods

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were planted in Ngqobo KwaZulu Natal.

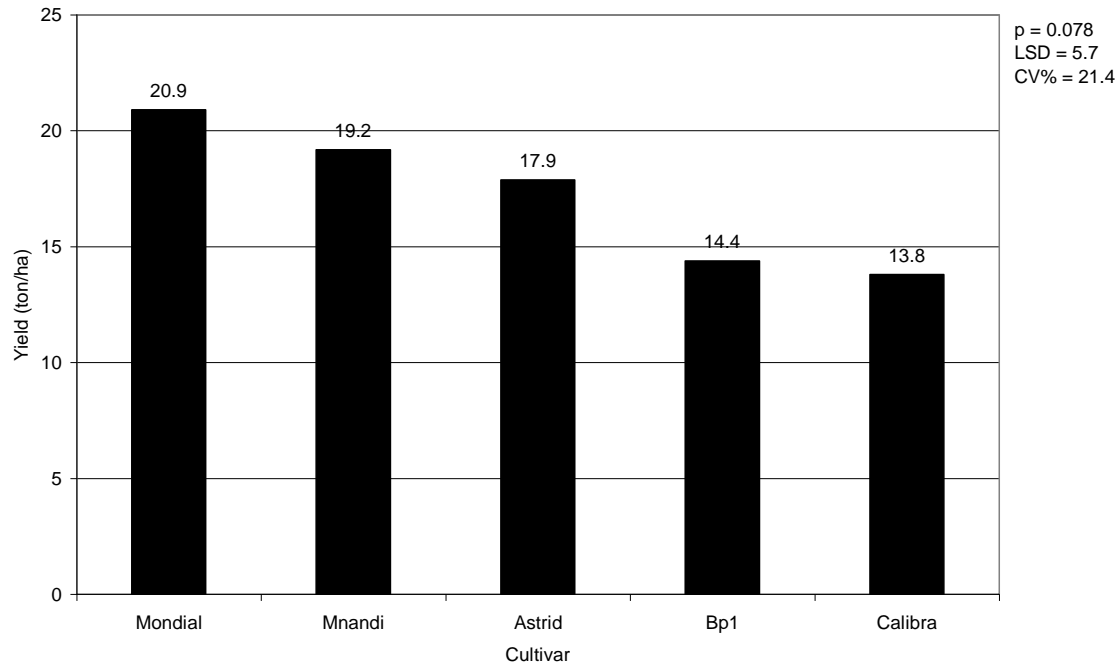
Results

Table 1. Growing period from emergence to natural foliage die-off.

Cultivar	Days
Astrid	90-120
BP1	90-110
Calibra	90-110
Mnandi	90-120
Mondial	95-100

Results

Figure 1. Total yield (ton per hectare) of cultivars in Ngqobo KwaZulu Natal.



Conclusion

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were trialed under irrigation in Ngqobo KwaZulu Natal. The cultivar Mondial obtained the highest yield and was significantly higher than all the other cultivars, except for Mnandi and Astrid. Calibra, Bp1, Astrid and Mnandi fell into the lowest yielding group and did not differ significantly from each other. The cultivars Mondial, Mnandi and Astrid obtained higher yields than the trial average (17.24 ton/ha).

PROJECT TITLE: TSOLO CULTIVAR TRIAL & TRAINING

PROJECT MANAGER: Louis Pretorius

BEGIN DATE: July 2006

END DATE: JUNE 2009

START DATE: JULY 2006

SUMMARY

Planting date: September 2006

Harvesting date: February 2007

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were trialed under irrigation in Tsolo, Eastern Cape. The cultivar Astrid obtained the highest yield and was significantly higher than all the other cultivars except for Mondial and Mnandi. BP1, Calibra and Mnandi fell into the lowest yielding group. The cultivars Astrid, Mondial and Mnandi obtained higher yields than the trial average (21.5 ton/ha).

OBJECTIVES 2004/2005

Cultivar trials are done to compare new with commercial cultivars in all the potato producing areas of South Africa. This trial was done in Tsolo, Eastern Cape.

Introduction, Materials and Methods

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were planted in Tsolo, Eastern Cape.

Results

Table 1. Growing period from emergence to natural foliage die-off.

Cultivar	Days
Astrid	90-120
BP1	90-110
Calibra	90-110
Mnandi	90-120
Mondial	95-100

Results

Figure 1. Total yield (ton per hectare) of cultivars in Tsolo, Eastern Cape.

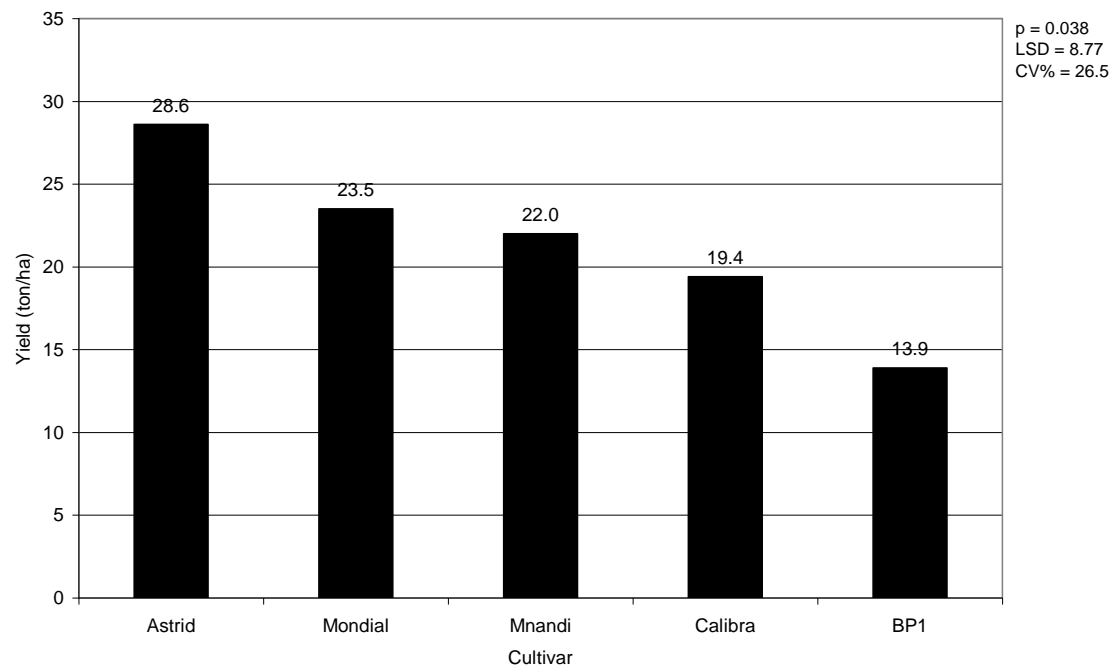


Table 2. Size distribution as a percentage of the total yield per cultivar

Cultivar	% Large	% Medium	% Small	% Extra small
Calibra	18.02	58.32	17.33	6.14
Mnandi	32.52	39.31	16.18	11.83
BP1	10.97	39.72	35.56	14.17
Astrid	32.28	41.81	20.47	5.17
Mondial	21.79	57.08	15.85	5.09

Conclusion

The cultivars Astrid, BP1, Calibra, Mnandi and Mondial were trialed under irrigation in Tsolo, Eastern Cape. The cultivar Astrid obtained the highest yield and was significantly higher than all the other cultivars except for Mondial and Mnandi. BP1, Calibra and Mnandi fell into the lowest yielding group. The cultivars Astrid, Mondial and Mnandi obtained higher yields than the trial average (21.5 ton/ha).