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**The decision to employ women on wine farms:  
Experience in the five years following the introduction of  
statutory minimum wages**

**Beatrice Conradie**



Employment Promotion Programme



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Beatrice Conradie  
School of Economics, University of Cape Town  
[Beatrice.Conradie@uct.ac.za](mailto:Beatrice.Conradie@uct.ac.za)

## **Abstract**

It is widely recognised that the wives of regular farm workers have always been a source of cheap seasonal labour on the fruit farms of the Western Cape. There is some evidence that the deciduous fruit industry has moved towards more equal opportunities for women during the late 1980s and early 1990s. By the late 1990s a number of new laws aimed at regularising the farm labour market. When the basic conditions of employment act was amended in 1997 to include agriculture, many more wives of regular farm workers were given formal employment contracts but it was really only with the introduction of the statutory minimum wage in 2003 that farm women were given equal pay for equal work. Initial surveys revealed that many wine farmers met the wage increase brought about by the statutory minimum wage by reducing the hours of employment for women, which left them worse off than before the labour laws were passed. This paper examines the decision to employ women permanently in equal jobs by analysing multiple years of employment data for 80 wine farms in the Breede River Valley. Logit results show that both characteristics of the farmer and farm, particularly employment practices on the farm, affect the decision to employ women in permanent jobs, although the owner's education and approach to outsourcing matter most.

**Keywords:** farm labour markets, outsourcing, gender discrimination, wine farms

## Introduction

The Western Cape wine industry produces wine from about 1.25 million tons of grapes grown on 125 thousand hectares. A quarter of the wine produced is exported to Europe. One in five wineries is private; the rest are large cooperatives which process grapes predominantly from family farms. SAWIS (2004) estimates that more than half of the crush originates from small farms (30 – 50 hectares) and that the industry employs besides family labour, also the workers from an estimated 60 thousand additional households. Most regular staff and their families live on the property, in housing provided as one of the main perks of the job. Wine farms employ both these men and their wives, but recent data shows that 2.5 permanent men are employed for every woman in a permanent job. Historically the wives of regular men were only seen as a cheap source of core seasonal labour (Beyers, 1971; Levy, 1977; Du Toit, 1993; Orton et al, 2001). The average duration of the seasonal contract depends on the kind of fruit grown, and has changed with cultivar mix and production technology (Conradie, 2007).

Farm work is gendered in the Western Cape (Kritzinger & Vorster, 1996). Men are the skilled machine and irrigation operators and they drive tractor. Men are also solely responsible for any heavy digging and lifting, including the carrying of ladders to work the tops of trees. For many years pruning was an exclusively male domain, supposedly because women were not skilled enough for the job. Initially women's involvement in pruning was to clean-up after male workers or to prepare vines or trees for them. Farmers often say that the pruning done by women in the 1970s and 1980s was work 'made' for them with the expressed purpose of smoothing farm workers' incomes in order to improve socio-economic conditions on the farm. Dorrington & Dorrington (1976: 3-4) give the following account of labour conditions on their fruit farm:

"Their [the farm workers'] purchases are carefully watched so that luxury overbuying does not occur from our farm shop. Advice is always given even though not sought at times. ... We frown on sweets with low nutritional value and encourage wholesome chocolate types. We run a non profitmaking shop purchasing almost always at the best whole sale prices or where specials are offered.

...

Family planning is carefully explained to old and young so that each couple has its needs and desires discussed and cared for... A clinic is held on our mountain regularly ... and this has been of immense value to us.

...

Wages vary from R33 to R15 per 5½ day week with free housing, electricity, water, medical and dental services as well as in most cases subsidised meat and groceries. Wives are paid on a daily basis and average R8.00 per 5 day week.

...

We actively encourage all wives and single girls to work so that they are engaged for at least 9 months of the year. However they work shorter hours so that they can do their domestic chores in time. "

Graaff (1976), Petersen (1976) and Van der Merwe (1976) gave similar accounts although Theron (1976) and Waldman (1993) painted a much less rosy picture of alcohol abuse, poor nutrition, run-ins with the law, absent husbands and fathers and women's ambitions to escape the farm.

The interesting aspect of the Dorrington account is not so much the benevolent paternalism that governed the small farm worlds (Du Toit, 1993), but the fact that women were employed in the orchards for 'at least 9 months of the year' with seasonal contracts including besides picking also thinning, packing and pruning (Kritzinger & Vorster, 1996; Levy, 1977). The transition from pruning assistants to being able to take full responsibility for the job often happens naturally when employers assign winter pruning to women under the pressure of a fast approaching spring. Even then, women get the oldest orchards or vineyards where their inexperience can do least damage. But the process was irreversible; once women are considered skilled enough for the pruning task, it became their right and they would always be involved in it.

Agriculture generally, and fruit production in particular, is a seasonal process which makes some degree of seasonal employment desirable. Having said that, the extent to which a farmer relies on seasonal labour is a management decision resulting from cost minimisation behaviour. Some farmers may choose to rely on a large seasonal labour force employed for a short period only while others value having a large proportion of permanent staff that they are willing to diversify into a wider range of crops and cultivars.

Previously the standard excuse for not putting women in permanent jobs was that the farmer needs the labour flexibility and that the farm women he employs during the season wants the flexibility to be able to attend to housekeeping and childrearing duties, or go to the clinic or collect child support grants. Mostly these compromises were negotiated within the constraints of the present workload.

This paper examines the decision to employ women in permanent jobs with a logit model. Section 2 discusses the legislative framework and how farmers may have responded to it, while Section 3 describes data collection. Descriptive statistics are given in Section 4 and model specification in Section 5, and the paper ends with results and discussion in Section 6. Results suggest that the decision to employ women on farms is a function of employer and farm characteristics and also determined by the existing labour practices on the farm.

### **Legislative framework**

In 1997, the Basic Conditions of Employment Act (Act 75 of 1997) was extended to agriculture. As elsewhere in the economy, this law formalised employment agreements to provide amongst others for paid leave, written contracts and maximum working hours. In theory this legislation would make a significant impact on farm labour arrangements, which according to Kritzinger & Vorster (1996) were still largely oral contracts at that point. Faced with the Basic Conditions of Employment Act, it was expected that farmers would formalise their existing labour arrangements

to the advantage of farm workers. Many male farm workers did indeed benefit by ways of a formal written employment contract as legislators expected them to, but women farm workers typically did not get the same benefits as it was difficult to reconcile the flexibility fruit farmers were used to with the tight prescriptions of the act. Instead of formalising working conditions for women, the Basic Conditions of Employment Act caused farmers to drop their employment of women under the radar screen of formal contracts thereby halting the process of more than a decade by which women farm workers were gradually brought out of seasonal jobs into formal employment (Kritzinger & Vorster, 1996). Orton et al (2001) claim that even where women had permanent status they often thought of themselves as temporary staff, Farmers chose to hide their female workers rather than lose flexibility because the perceived cost of the new legislation was quite low in the absence of rigorous enforcement. Access to farms has always been notoriously difficult, making it unlikely for the Department of Labour to do a labour inspection until they receive a complaint.

The impact of the Basic Conditions of Employment Act was really only felt as a result of two other pieces of legislation. Also in 1997 parliament ratified the Extension of the Security of Tenure Act (act 62 of 1997), the intention of which was to regularise farm evictions. Unfortunately this legislation coincided with the first of the farm occupations by war veterans in Zimbabwe, so the law was immediately interpreted as an attempt by government to establish additional land claims on white owned farm land, particularly in the Western Cape which previously had very few land claims. Acknowledging that new labour legislation increased the perceived cost of labour, Barrientos & Kritzinger (2004) and Ewert & Du Toit (2005) predict outsourcing or casualisation as the most likely response to falling international fruit and wine prices.

Following the introduction of the Extension of the Security of Tenure Act, the Western Cape winelands have seen a number of evictions (including the highly published Lanzerac case), although the act only caused permanent jobs to be frozen on most farms. When permanent staff retire or resign they are not replaced, which means that the industry is still shedding labour even if there was hardly any initial effect. For example, the period for which we have data shows declining total employment at just over 2% per year compared to declining permanent employment of 3% per year. Evictions are not always enforced; sometimes farmers have tried to make it attractive for permanent staff to relocate by stopping maintenance of the labour cottages and doing no further investment on them. The freezing of permanent posts indirectly benefitted farm women, since farmers in an attempt to minimise the risk of future claims on their land, were more inclined to appoint women in fulltime jobs than hire an unknown persons off the street. However, the benefits to women are not unambiguous. According to the South African Human Rights Council (2003) "... it is almost impossible for women to obtain employment and housing on farms, with housing being reserved for men, who are still regarded as the traditional head of household."

In February 2003 a statutory minimum wage was introduced for agriculture at an A and B level of R800 and R650 per month respectively. Annual nominal increases of about ten per cent per year applied for the first six years. Deflated by an all-areas CPI, the A districts received real statutory minimum wage increases of only 2% per year, compared to annual raises of 6 % in the B districts. In 2003, the initial wage increases

for women were substantial (Conradie, 2004). The statutory minimum wage for agriculture affects farm employment in two ways. Its first and most obvious effect is to increase the cost of employment, causing farmers to reduce employment and switch to more productive workers at the minimum (Brown, 1999). This caused women, the elderly, youths and the least experience to be less attractive than experienced men. In addition, the statutory minimum wage made the Basic Conditions of Employment Act more effective. Having an easily understood and widely known wage to complain about, made disgruntled workers more likely to give tip-offs to the Department of Labour who would then often find the farm to be paying the right wage but be in contravention of a range of Basic Conditions of Employment Act requirements.

The statutory minimum wage therefore confronted farmers anew with the decision to employ farm women permanently or to only use them in crunch times. A range of strategies are possible and are being followed. Recent waves of an annual survey of employment decisions have revealed a return to the more traditional set-up of resident staff after an initial experiment with outsourcing.

### **Data collection**

The dataset consists of a random sample of wine farms surveyed annually from 2003 to 2007. The data was collected in face-to-face interviews, most often conducted with the owner-manager, but sometimes with his representative for example with his retired father or wife. The majority of respondents are Afrikaans-speaking males, aged anywhere from their early twenties to their late sixties or early seventies. The interviews took place during the working day in the off-season, normally in late July or August of each year. The duration of individual interviews depend on how easily farm records could be accessed, normally around half an hour.

Not all respondents could be interviewed in all years. In cases where an interview was missed due to special circumstances such as a birth, death, major construction or an extended trip, the farm remained in the sample and was visited again in the following wave. The panel was refreshed in 2007 to keep the number of observations above 70. The number of observations per year and the associated attrition rates are listed in Table 1. Variables collected in all four waves will thus produce samples with 365 observations, but several variables were not included from the first wave, either because sufficient trust did not exist that would allow these data to be collected at first (e.g. financial data) or further questions were introduced to clarify unclear answers (e.g. the difference between electrification and the provision of free electricity).

The access achieved and attrition suffered by this panel needs to be understood in the context of farmers being very sceptical of 'government', a category under which they included the University of Cape Town. Other studies conducted in this period (Sunde & Kleinbooi, 1999; Du Toit & Ally, 2003) and even the 2002 Farm Census recorded very low response rates. In contrast, initial refusals and unusable responses were quite low (3.75%) in this study. The initial attrition (between waves 1 & 2) was higher at 7.79% of the wave 1 sample lost, and after that it stabilised at less than 1.5% per year. The cumulative attrition of the original sample now stands at 12%, but the panel was refreshed in 2006 and 2007 and had 76 observations in 2007. Some substitution of

respondents has taken place, usually from an owner to his wife, but also from fathers to sons and from sons to fathers.

**Table 1: Number of observations and attrition rates for a panel of wine farms**

Sample	2003	2004	2005	2006	2007
Responses from 2003 sample	78	71	70	69	68
Attrition rate year on year	-	7.79%	1.41%	1.45%	1.47%
Responses after refreshing	77	71	70	71	76
Net attrition rate	-	7.79%	9.09%	7.79%	1%

Given the scepticism of farmers, a limit amount of payroll data could be obtained. The dataset includes fairly good employment numbers by category of staff including the duration of the contract for part-time and seasonal staff. Employment is available by gender for farm staff, but not for non-resident seasonal staff and contract workers. Wage data is available for four reference staff members, namely that of the best paid and worst paid man and woman on the farm, and we have some indication of the non-cash benefits provided including housing, geysers, electricity, transport and medical and funeral benefits provided. Farmers have no clue what it cost them to provide these services, so it is not really possible to fully account for the effective wage after benefits. An average nominal wage was calculated by dividing total labour cost by fulltime equivalent employment. We also have the proportion of the workforce employed strictly at the statutory minimum as reported by the farmer, which gives some indication of the wage distribution by gender and can be used as a crude proxy for employment practices generally.

### **Descriptive statistics**

Table 2 summarises a range of employment, farm and farmer variables. The average farm employs 0.42 fulltime equivalent workers per hectare per year, with a minimum recorded employment level of 0.17 of fulltime equivalent workers per hectare and a maximum employment of 1.49 fulltime equivalent workers per hectare. Part time and seasonal jobs were converted into full-time equivalent jobs based on the hours worked. The large variation is partly due to differences in labour productivity but is also influenced by crop mix and by whether any of the fruit produced is processed or packed on the farm.

Total employment consists of permanent employment, part-time work, seasonal work and contract work. The difference between part-time on the one hand, and contract or seasonal work on the other hand is that resident staff hold part time jobs while seasonal and contract labour is sourced from nearby towns and informal settlements during the summer and winter respectively. As explained previously, it was customary for employers to use the wives of permanent men as their main source of part-time work, and this still remains to be the case. The average farm employs women for 75%

of a fulltime week, and women supply 31% of the total employment compared to the 59% of total employment supplied by permanent men. If one separates women's contribution to the farm labour force into permanent jobs and seasonal jobs, about two thirds of their share is held by women in permanent posts and one third by women in part-time posts. For men the picture is quite different. Their jobs are almost exclusively permanent with only about 1% of total employment deriving jobs for part-time men. We do not know the gender breakdown of seasonal and contract work, but we know anecdotally that the seasonal summer work traditionally belonged to women (see Levy, 1977), while winter pruning was done by male migrant teams on which the current system of labour broking of contract work is based. Currently the traditional gender lines of contract and seasonal work have been blurred with displaced male farm workers and other unemployed men taking seasonal jobs and women working for labour brokers.

Women work less than men and also earn lower wages for the work that they do. Data is not available to calculate an average wage by gender, but Table 2 lists the reported proportion of the male and female workforce employed at the minimum wage. Where a statutory minimum wage is binding, Brown (1999) predicts that employers will substitute to cheaper sources of the same quality of labour or to more productive labour. If neither of these strategies are possible employers will simply absorb wage increases but the wage distribution will be bunched at the level of the statutory minimum wage. For women the bulge is more noticeable than for men, with 73% of women locked in exactly at the minimum wage, compared to only 22% of men.

Despite the small contribution made by women to total labour supply, most farms employ some women – 73% of respondents interviewed employ women in permanent positions, 40% employ them in part time positions and 15% of farms employ women in both full time and part time jobs, while only one respondent reported employing neither part-time nor permanent women.

A wide range of non-cash benefits are provided to farm workers by their employers (Kritzinger & Vorster, 1996). Table 2 lists some of the most commonly encountered items in the order of the frequency with which they were encountered. Almost all farm workers' cottages are electrified, some at quite a basic level and others more fully. Sixty per cent of employers reported providing free electricity. Those who do charge for electricity, charge rates ranging from the bulk farm electricity tariff to urban pay as you go rates, and sometimes above that. Roughly a third of the farms in the sample have hot water installed in the workers' cottages, but only 11% of farms provide both hot water and free electricity, often where there are solar panels for hot water rather than electrical geysers. Finally, free transport to town once a month or once a fortnight is a traditional benefit often necessitated by the absence of a public transport service to distant farms. About half the employers interviewed still provide free transport; the other farms are not either served by public transport systems or they charge for transport.

**Table 2: Descriptive statistics**

<b>Variables</b>	<b>n</b>	<b>mean</b>	<b>st.dev</b>	<b>min</b>	<b>max</b>
<i>Employment variables</i>					
Total employment persons/ha /year	365	0.42	0.19	0.17	1.49
% of labour contributed by					
permanent staff	365	79%	17%	33%	100%
permanent women	365	22%	17%	–	62%
permanent men	365	58%	13%	24%	100%
resident part-time women	365	9%	13%	–	50%
resident part-time men	365	1%	6%	–	43%
Avg. female working hours / week*	362	75%	39%	–	100%
% females at minimum wage	342	73%	40%	–	100%
% males at minimum wage	356	24%	34%	–	100%
Non-wage benefits (1= yes)					
House electrified	361	96%	20%	–	100%
Free electricity	360	60%	47%	–	100%
Transport	364	47%	50%	–	100%
Geyser installed	265	32%	45%	–	100%
Medical	364	27%	40%	–	100%
<i>Farm descriptors</i>					
Size (ha)	365	96	72	5	379
% wine grapes	362	75%	24%	–	100%
Tractors (number/ ha)	358	0.08	0.05	0.02	0.40
Grape picking machine (number)	357	0.44	0.47	0	2
Distance from town (km)	365	15.9	8.0	1	38
Total cost of production (R/ha)**	307	19 325	12 011	5 214	81 542
Labour cost (R/ha)**	327	4 272	2 305	875	16 608
Fuel cost (R/ha)**	322	799	476	205	4184
Chemical & fertiliser cost (R/ha)**	193	1 978	910	448	8 627
<i>Farmer characteristics</i>					
Age	365	41.7	9.3	22	67
Education (years)	365	14.5	1.6	10	17
Home language (1 = Afrikaans)	365	1.03	0.19	1	2
Gender (1= male)	365	1.09	0.29	1	2

\* Based on a standard 45 hour week. Cognisant of the seasonal nature of farming, the Basic Conditions of Employment Act permits flexible working hours of up to 50 hours per week in summer, on the condition that longer summer hours are offset by shorted hours in winter.

\*\* Real values where 2000 = 100

According to Orton et al (2001) benefits accrue to men as heads of household, but the minimum wage regulations passed in 2003 changed the traditional pattern. It provides for a ten percent deduction for free housing provided that the housing meets certain minimum requirements, which farmers found a useful way of maintaining the gender wage gap in practice. Thus many female farm workers now in name receive the housing benefit while their husbands earn a higher cash wage. This information is anecdotal, as is evidence that many farms provide free doctor's visits, free electricity and credit at the shop per worker, rather than per household. Organising benefits thus encourage women to work of course which means that the farmer gets better returns on his investment in workers accommodation.

The farm descriptors in Table 2 include farm size, crop mix, distance to town, two mechanisation variables and selected cost figures. The sample includes both very small and very large farms (by local standards), with an average size of about a hundred hectares. Most of the farms in the sample can be described as wine farms. On average 75% of the crop consists of wine grapes, and on 56% of farms wine grapes are more than three quarters of the crop in volume terms. On about 5% of farms wine grapes contribute less than a third of total output, but only 1% of the observations report no wine grapes at all.

All farms use tractors, the number commensurate with the farm's size. The average farms use six tractors or 0.08 tractors per hectare. Tractors are notoriously lumpy, and consequently large farms use statistically significantly fewer tractors per hectare than smaller farms. Farms of less than a hundred hectares on average use 0.10 tractors per hectare compared to 0.06 per hectare on farms of more than a hundred hectares and  $t = 7.1774$  ( $p = 0.0000$ ) in a two sample test of means assuming equal variance. Curiously, since one would not expect the lumpiness of tractors to translate into more use and hence higher fuel cost per hectare, there is a significant difference in unit fuel cost between large and small farms with  $t = 1.9241$  ( $p = 0.0552$ ); the average fuel cost for large farm is R836 per hectare compared to R729 for small farms. Large farms are more likely to automate or mechanise grape picking than small farms. The automatic picking variable in Table 2 is the proportion of the farms in the sample that own picking machines (regardless of the extent of use). The average proportion ownership of 0.44 consists of 21% of smaller farms owning or renting a picking machine compared to 87% of farms larger than a hundred hectares.

The average cost of production is R19 325 per hectare, and on average consists of 22% labour cost, 4% on fuel and 10% on chemicals and fertilisers. Farms of more than a hundred hectares have statistically significantly lower unit production costs, than farms of a hundred hectares or less. The mean cost of production for large farms is R16 540 compared to R20 757 per hectare on small farms. The t-statistic of a two sample test assuming equal variances is  $t = 2.9558$  ( $p = 0.0034$ ).

Large farms have a lower labour cost per hectare, because they employ fewer people per hectare than small farms, and not because they pay less. The average labour cost per hectare of farms of more than a hundred hectares is R3611 per hectare compared to R4611 per hectare on smaller farms. The result of the t-test is  $t = 3.7915$  ( $p = 0.0002$ ) indicate that the difference is statistically significant at better one percent. Large farms on average employ 0.33 fulltime equivalent workers per hectare which is

significantly less ( $t = 6.3976$ ,  $p = 0.0000$ ) than the 0.46 fulltime equivalent labourers employed per hectare on smaller farms.

The respondents to the survey are on average just over forty years old, predominantly male and Afrikaans speaking. On average they have just more than a two year tertiary diploma. It is expected that education has a strong influence on whether a farmer chooses a modern or traditional (labour) management style. Using the employment of women in permanent jobs as proxy for management style, it is found that farmers with a bachelors degree or more is statistically more likely to have a modern management style than those with less than a bachelors degree. The reason for not splitting the sample into respondents with high school only and respondents with a tertiary education is that agricultural college is often secluded affair where students rarely are brought into contact with views other than those found in the traditional agricultural circles, but if students go to university they are exposed to a range of new ideas and meet diverse people. The average university graduate employ 0.10 permanent women per hectare compared to 0.08 permanent women per hectare on farms where the owner is not university educated. This difference is statistically significant in a t-test of means assuming equal variances with  $t = -2.1166$  ( $p = 0.0350$ ).

### Model specification

Permanent status is used as a proxy for discrimination against women in farm labour markets. The decision to employ women in permanent jobs is modelled with the following binary logit model:

$$\text{prob}(y_i = 1) = F(\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_n X_{ni})$$

where  $F(z) = \frac{e^z}{(1 + e^z)}$  is the cumulative logistic distribution

If the logit takes a positive value it means that the probability of  $y_i = 1$  increases as the value of the independent variable increases, or decreases as the values of the regressors fall. The marginal effect of a one unit change in X varies with Y as follows:

$$\frac{\partial E(y)}{\partial x_k} = \frac{e^z}{(1 + e^z)^2} \beta_k$$

which can be rewritten as:

$$\frac{\partial E(y)}{\partial X_k} = p(1 - p)\beta_k \quad \text{where} \quad p = \frac{e^z}{(1 + e^z)}$$

Three groups of factors are hypothesized to influenced the decision to employ women in permanent jobs on farms, namely characteristics of the farmer, the farm and the farmers' other labour arrangements.

Given that the sample consists predominantly of Afrikaans speaking men, the farmer is only described by his age and education. Both these variables are logged. We hypothesise that older farmers ( $X_1$ ) would be more conservative than younger farmers and thus less likely to employ women in permanent jobs ( $\beta_1 < 0$ ) than their younger neighbours. More education ( $X_2$ ) was expected to have a positive impact on gender equality ( $\beta_2 > 0$ ). Alternatively one could use a dummy variable for a university education where  $X_2 = 1$  if the respondent has fifteen years or more and  $X_2 = 0$  if not. The expected sign is as for the continuous variable.

The farm characteristics included in the model are distance to the nearest town, size, crop mix and fuel expenditure per hectare. The expected sign on the natural logarithm of distance ( $X_3$ ) is negative ( $\beta_3 < 0$ ) since more remote farms are less likely to be inspected by the Department of Labour and generally are under less pressure to change than farms closer to centres of information. Farm size in hectares and logged ( $X_4$ ) is expected to be positively related to permanent jobs for women ( $\beta_4 > 0$ ), because large farms have a larger staff potentially with more permanent jobs. Alternatively larger farms might have formal HR person who might insist on gender equality while an owner-operator of a small farm might not even think of it. Crop mix ( $X_5$ ) is modelled as a dummy variable which separates farms with more than 75% wine grapes from farms on which wine grapes contribute 75% or less of total output. While it is well known that other fruit industries use far more women than the wine industry, it is expected that a larger proportion of wine grapes would be positively related to the probability of employing women permanently ( $\beta_5 > 0$ ). The reason is that wine grapes, unlike any other type of fruit produced in the Western Cape, can be picked by machine, which substantially flattens the harvest labour peak and thus increase the proportion of job equivalents that could potentially be permanent for a given farm size.

Mechanisation ( $X_6$ ) can be measured in a number of ways ranging from fuel expenditure per hectare to tractors per hectare to the use of particular equipment such as automatic grape picking machines, or even the proportion of the crop picked by machine. Using the labour smoothing argument, one could argue that more mechanisation acts as a substitute for seasonal labour which means that more jobs ought to be permanent ( $\beta_6 > 0$ ). Despite that we have incomplete financial data for 2007 we used the natural logarithm of fuel expenditure per hectare as a proxy for mechanisation levels, since a large proportion of the tractor capacity on small farms go unused. However, signs and marginal effects were similar regardless of whether tractors per hectare or fuel expenditure per hectare were used.

Other labour conditions on the farm were described with a permanent employment dummy, the level of employment as well as a range of non-cash variables provided and a dummy variable indicating the use of women in part-time jobs. The argument regarding the effect of total employment per hectare ( $X_7$ ) is similar to that of farm size; the larger the workforce, the better chance women have of getting permanent jobs ( $\beta_7 > 0$ ). The share of work that is permanent ( $X_8$ ) should improve the chances of some permanent jobs being given to women ( $\beta_8 > 0$ ). Similarly, if a farmer already employs women in a part-time capacity ( $X_9$ ) it is more likely that he would also employ women in permanent jobs ( $\beta_9 > 0$ ). Alternatively one could argue that an employer does one or the other, that is, either employs women in permanent jobs or

keeps then in part-time jobs, in which case ( $\beta_9 < 0$ ). Three non-cash benefits are modelled namely medical benefits ( $X_{10}$ ), the presence of a farm shop ( $X_{11}$ ) and whether hot water is provided in staff cottages ( $X_{12}$ ). In all three cases the expected signs are negative ( $\beta_{10} < 0$ ,  $\beta_{11} < 0$ ,  $\beta_{12} < 0$ ) for the same reason, namely that an extensive provision of non-cash benefits speak of strong paternalism that makes it unlikely that women will have permanent jobs. The farm shop is a particularly strong indication of employers being willing to ignore the low in order to maintain a traditional system.

## Results & discussion

Table 3 reports the empirical results. The likelihood ratio statistic of -59.6643 which is  $\chi^2(12) = 231.69$  distributed ( $p=0.000$ ) and the pseudo  $R^2 = 0.66$  indicate a good overall fit. Just one coefficient is not significant at better than 15%, but carry the expected sign. Almost all variables carry the expected sign.

The first of the unexpected signs appear on the age variable, and is a pleasant surprise. The results indicate that if one controls for education and a range of farm and labour descriptors, older farmers are more likely to employ women in permanent jobs than younger farmers. This means that older farmers are as open labour reforms as their younger neighbours, which is a pleasing result. A one percent increase from the mean of 41.7 years will have a large marginal effect of increasing the probability of hiring women in permanent jobs by 6%. The relatively young sample reported on here, possibly the reason for this unusual result. The education variable is positive and highly significant. This confirms the hypothesis that better educated farmers follow more modern management practices and are more open to farm labour reforms. The marginal effect of 0.207 suggest that a one percent increase in the average education of 14.5 years increase the probability that farmer will employ women in permanent jobs by almost 21%. This result together with the result on the effect of age suggest that one could get greater gender equality in far labour markets through a public information campaign, but that such a campaign should be aimed at all ages and not just target the older farming community.

The negative sign on the distance to town variable confirms that women are more likely to be employed in permanent jobs on farms closer to town than on farms further away, and that there is an isolation effect as hypothesised. A one percent increase in the average distance to town of 15.9 kilometres, reduce the probability of employing women in permanent jobs by about 2%. Several factors could potentially be at work here, including better informed employers and employees, greater fears of government labour inspections, as well more job opportunities closer to town, so that only farms offering permanent jobs attract women close to towns. A good public transport system is essential if government wants to improve the labour market conditions for farm women living in isolated communities. Alternatively, the Department of Labour could direct their inspections at farms located further out of town rather than concentrate on the complaints received from workers living on farms closer to town.

**Table 3: Empirical results of the logit model and marginal effects explaining the probability of employing women in permanent jobs**

Regressors	Model 1			Model 2		
	Coefficient	z-value	Marginal effect	Coefficient	z-value	Marginal effect
ln(age)	2.4404	1.81*	0.060	2.3477	1.70*	0.071
ln(education)	8.4224	3.41***	0.207	9.7425	3.25***	0.296
ln(distance)	-0.7884	-1.65*	-0.019	-0.7666	-1.52*	-0.023
ln(farm size)	1.9277	4.18***	0.047	1.8552	3.81***	0.056
crop D (=1 if grapes $\geq$ 75%)	1.3034	2.13**	0.036	1.1007	1.66*	0.036
%grapes *% picked by machine				0.0350	1.28	0.001
ln(fuel expenditure/ha)	-1.4582	-2.67***	-0.036	-1.7281	-2.38***	-0.053
ln(total employment/ha)	3.2201	3.60***	0.079	3.2430	2.98***	0.099
share of employment permanent	8.5048	4.54***	0.209	8.5135	3.82***	0.259
part-time women D (=1 if yes)	-4.2253	-5.28***	-0.264	-4.3040	-4.02***	-0.268
medben D (=1 if medical)	-0.4727	-0.84	-0.013	-0.8010	-1.19	-0.024
shop D (=1 if farm shop)	-1.0878	-1.83*	-0.027	-1.1813	-1.73*	-0.037
geyser D (=1 if hot water)	-0.9271	-1.53*	-0.026	-1.1465	-1.66*	-0.041
constant	-26.3278	-2.62***		-26.9371	-24.6***	
n	312		n	237		
Log likelihood	-59.6643			-47.9557		
LR chi <sup>2</sup> (12)	231.69		LR chi <sup>2</sup> (13)	178.65		
P > chi <sup>2</sup>	0.0000		P > chi <sup>2</sup>	0.0000		
Pseudo R <sup>2</sup>	0.6603		Pseudo R <sup>2</sup>	0.6506		

Note: \*\*\* significant at better than 1%, \*\*significant at better than 5%, \*significant at better than 15%

The farm size variable is positive and significant as hypothesised; a one percent increase in farm size from the average of 96 hectares, will increase the probability that that farm employs some women in permanent jobs by 4.7%. This underlines the trade-off faced by the government between favouring smaller farms that will employ more people versus large farms which are more likely to follow modern labour practices.

The second unexpected result involves the coefficients on the crop dummy and per-hectare fuel expenditure. As explained before, it is possible to justify a positive relationship between the crop dummy (= 1 for more 75% wine grapes) and permanent jobs for women arguing that machine picking of grapes flatten the labour peak which lowers the need for seasonal work and thus improves women's chances of permanent jobs. However, if it was a mechanisation effect, the coefficient on the fuel variable should have a positive sign confirming that permanent jobs for women are associated with high levels of mechanisation. Unfortunately Table 3 shows that this is not the case, and that the coefficient on the natural log of fuel expenditure per hectare is negative and highly significant. While the marginal effect is not particularly large, the results oppose the notion that women get permanent jobs when farms are highly mechanised.

In order to further investigate the mechanism driving the capital labour substitution and how it affects permanent jobs for women, an alternative model (reported in the second part of Table 3) was estimated. This model introduces an additional variable which interacts the farm's proportion of wine grapes and the proportion of that wine grapes picked by machine. The variable improves on the first model by separating out the mechanical picking of wine grapes from the general proxy for mechanisation. While picking machine ownership was recorded in all five waves, wave one did not ask the question about the extent of machine picking of a farm's wine grapes. Thus introducing the interaction term reduces the number of observations from 312 to 237. Despite the smaller sample size the second model produces coefficients with similar signs significance levels and marginal effects as the first model. The wine grape crop dummy remains positive and significant, and fuel expenditure per hectare negative and significant. Although marginally ( $z = 0.20$ ) not significant, the interaction term is positive confirming that the mechanisation of grape picking improves the chances of women having permanent jobs. This result means that one accounts for mechanical picking of wine grapes, farms that are otherwise more mechanised are less likely to employ women in permanent jobs *ceteris paribus* than farms where more jobs are done by hand.

The link between total employment per hectare and the chances of employing women is confirmed by the employment variables. First, the coefficient on the natural log of total employment per hectare is positive and significant and has a marginal effect of about 8%. Secondly, it is not only the level of employment that matters for how farmers think about the women they employ, but also whether the farmer emphasises permanent employment or not. As expected, if permanent staff hold a larger share of total employment, chances are that some of them will be women. Third, we find that part-time employment of farm women crowds out permanent jobs for them. The sign on the part-time women dummy (=1 if any woman living on the farm is given a part-time job there) is negative and highly significant and its marginal effect is large. Farms employing women in part-time jobs are 26% less likely to also have women employed in permanent jobs, compared to neighbouring farms which have not. To

summarise then, some farmers choose to mechanise and others to use labour, some prefer permanent staff and others to outsource, and some to employ their farm women in permanent jobs and others in part-time jobs.

The paternalistic system of providing a wide range benefits and services to farm workers described by Dorington & Dorington (1976) generally lowers the changes of women being treated equally in the farm labour market. All three non-cash benefits included in the model carry negative signs and two are significant at better than 15%. Adding up across the marginal effects a farm providing all three the benefits listed here are 6.6% less likely to appoint farm women in permanent positions than farm that do not provide these benefits.

## **Conclusion**

At the surface legislative changes ought to have modernised farm labour markets and improved the rights of female farms workers. However, instead of more rights the Basic Conditions of Employment often took farm women off the books, while the housing subsidy permitted by minimum wage regulations gives them a benefit in name to which they have not claim in practice. But on the other hand, the Extension of the Security of Tenure Act, which is generally recognised to have harmed the position of permanent farm workers, benefits women indirectly, when farmers prefer housing a husband and wife rather than build an extra cottage (and invite an extra land claim) to house a second permanent man. The occasional farm has made the transition from permanent resident status for most staff to permanent non-resident employment, but farmers often mistrust the idea and say the housing exists and that they have no trouble with “their people” in any event. Despite the hypothesis that the position of women is determined by an employer’s response to labour and tenure legislation, modelling the decision to employ women in permanent jobs could not be shown to be influenced by farmers’ Lickert scale perceptions about the threat of labour laws, tenure laws or land grabs, and was rather well explained by a set of farm characteristics and current labour arrangements.

Delving more deeply into the crop mechanisation decision, it was shown that while fewer women are employed per hectare and proportionally on wine farms than on other fruit farms, their changes of having permanent employment is better than on mixed fruit farms. The link between permanent employment and machine picking of wine grapes and the danger to employment of mechanisation generally have also been fore grounded. While non-cash benefits lower the probability of hiring permanent women, the impact of the education of employers had been identified as a major determinant of modern labour practices. Finally, it is important to note the very slow adjustment to changing legislative frameworks. Labour needs are determined by crop mix and prevailing technologies, and to change technologies often involves substantial capital investment which farmers typically save for over long periods rather than buy it on credit. This process may still be ongoing on wine farms, where farmers have other options than to expand their permanent workforce.

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