



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Potential Impact of Labor Shift in the Southern Fruits & Vegetable Industry

Sebastain N. Awondo and Esendugue E. Fonsah
Department of Agricultural & Applied Economics
University of Georgia
U.S.A

Selected Poster prepared for presentation at the Agricultural & Applied Economics Associations 2013 AAEA & CAES Joint Annual Meeting, Washington, DC, August 4-6, 2013.

Copyright 2013 S.N. Awondo and E.G. Fonsah. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided this copyright notice appears on all such copies.

Potential Impact of Labor Shift in the Southern Fruits & Vegetable Industry

Sebastain N. Awondo and Esendugue E. Fonsah
Department of Agricultural & Applied Economics, University
of Georgia, U.S.A

Introduction

Fruits & vegetable industry is high dependent on low skill immigrant labor with hired labor shares

making up to 48% of their variable cost.

Increasing adoption and enforcement of Illegal Immigration Reform and Immigrant Responsibility Act (IRRA) by states has led to labor shortages in U.S Agriculture (Kostandini et al, 2012). These laws have been more popular in the Southern states of the U.S who are also major producers of fruits and vegetables. e.g. Fruits and vegetable growers in Georgia reported up 40% labor shortages during peak harvesting period in 2011 following the passage and enforcement of H.B. 87 (McKissick and Kane, 2011).

Objective

To estimate potential losses stemming from immigrant labor shortages in the southern fruits and vegetables industries.

Theoretical framework

Based on standard equilibrium conditions in the labor market and firms profit maximization of specific fruits and vegetable firms.

$$\frac{dq}{dN_{lsi}} = [\varkappa - \frac{(1-\varkappa)(1-\psi)}{\xi_{ls}}]w_{ls} + \frac{(1-\varkappa)}{\xi_{ls}}\psi w_{ls} - \frac{\Omega_s}{(1-\Omega_s)\xi_{ls}}(1-\varkappa)w_{ls} - \frac{\Omega_M}{(1-\Omega_M)\xi_{ls}}(1-\varkappa)w_{ls} - \frac{\Omega_K}{(1-\Omega_K)\xi_{ls}}(1-\varkappa)w_{ls} - w_{ls} \quad (1)$$

Where: $\frac{dq}{dN_{lsi}}$ = marginal loss in production associated to a reduction of one immigrant low-skilled farm worker; N_{ls} = low-skilled farm workers; N_s = skilled farm workers; M = materials; K = capital; w_{ls} = real wage rate-low-skilled labor; w_s = real wage rate-skilled labor; p = unit price; r = rent; N_{lsn} = low-skilled labor supply by native workers; N_{lsi} = low-skilled labor supply by immigrant workers; $0 \leq \varkappa \leq 1$; ψ = proportion of low-skilled workers that is undocumented; Ω_s = skilled labor share cost; Ω_M = material share cost; Ω_K = capital share cost; ξ_{ls} = demand elasticity of low-skilled farm workers.

Table 1: Cost shares, harvested/bearing acreage and hired farm labor

Crop	State(s)	Ω_S	Ω_{LS}	Ω_M	Ω_K	acreage	\bar{N}_{LS}
Vegetables							
Bell Pepper	FL,GA,NC,TX	0.18	0.30	0.36	0.16	32200	5736.19
Squash	FL,GA,NC,SC,TN,TX	0.18	0.30	0.36	0.16	20500	1287.02
Snap Bean	FL,GA,NC,SC,TN,VA	0.18	0.30	0.36	0.16	67700	2433.21
Cabbage	FL,GA,NC,TX,VA	0.18	0.30	0.36	0.16	29200	2648.92
Cucumber ^a	FL,GA,NC,SC,TX,VA	0.18	0.30	0.36	0.16	32900	3879.00
Cucumber ^b	FL,NC,SC,TX	0.18	0.30	0.36	0.16	25600	3018.31
Cantaloup	GA,SC,TX	0.18	0.30	0.36	0.16	8600	1434.01
Watermelon	AL,AR,FL,GA,MS,NC,SC,OK,VA,TX	0.18	0.30	0.36	0.16	93800	4189.78
Onion	GA,TX	0.18	0.30	0.36	0.16	20500	2523.28
Sweet Corn	AL,FL,GA,NC,TX,VA	0.18	0.30	0.36	0.16	81100	1690.97
Tomatoes	AL,AR,FL,GA,NC,SC,TN,TX,VA	0.12	0.40	0.34	0.14	55200	20586.62
Fruits							
Blueberries	AL,AR,FL,GA,MS,NC	0.12	0.40	0.34	0.14	22510	6081.69
Strawberries	FL,NC	0.15	0.36	0.34	0.15	10300	1939.95
Apple	NC,TN,VA,WV	0.15	0.36	0.34	0.15	24300	1539.59
Oranges	FL,TX	0.15	0.36	0.34	0.15	927000	11153.84
Peaches	AL,AR,GA,NC,SC,VA,WV,TX	0.15	0.36	0.34	0.15	36150	4349.64
Grapefruits	FL,TX	0.15	0.36	0.34	0.15	70400	4460.38
Grapes	GA,NC,VA,AR,TX	0.15	0.36	0.34	0.15	9900	627.24

^a=Cucumber fresh market ^b= Cucumber processing pickle.

Conclusion

A decrease in immigrant farm labor by 10%, 25% and 40% leads to potential losses of \$127.8, \$319.5 and \$517.7 million respectively across the southern states.

Tomatoes farms suffered the most losses followed by orange farms while sweet corn, grapes, apple and squash suffer the least.

Shortages of immigrant farm labor impacted Florida the most.

Table 2: Potential loss in production due to shortages in immigrant farm labor (\$million)

Crop	States	decrease = 10%			decrease = 25%			decrease = 40%		
		$\xi_{ls} = 1.5$	$\xi_{ls} = 2.5$	$\xi_{ls} = 5.5$	$\xi_{ls} = 1.5$	$\xi_{ls} = 2.5$	$\xi_{ls} = 5.5$	$\xi_{ls} = 1.5$	$\xi_{ls} = 2.5$	$\xi_{ls} = 5.5$
Vegetables										
Bell Pepper	FL,GA,NC,TX	9.49	9.47	9.45	23.74	23.67	23.61	37.98	37.87	37.78
Squash	FL,GA,NC,SC,TN,TX	2.13	2.12	2.12	5.33	5.31	5.30	8.52	8.50	8.48
Snap Bean	FL,GA,NC,SC,TN,VA	4.03	4.02	4.01	10.07	10.04	10.02	16.11	16.06	16.03
Cabbage	FL,GA,NC,TX,VA	4.38	4.37	4.36	10.96	10.93	10.90	17.54	17.49	17.45
Cucumber ^a	FL,GA,NC,SC,TX,VA	6.42	6.40	6.39	16.05	16.01	15.97	25.68	25.61	25.55
Cucumber ^b	FL,NC,SC,TX	5.00	4.98	4.97	12.49	12.45	12.43	19.98	19.93	19.88
Cantaloup	GA,SC,TX	2.37	2.37	2.36	5.93	5.92	5.90	9.49	9.47	9.45
Watermelon	States ^a	6.93	6.92	6.90	17.34	17.29	17.25	27.74	27.66	27.60
Onion	GA,TX	4.18	4.16	4.16	10.44	10.41	10.39	16.71	16.66	16.62
Sweet Corn	AL,FL,GA,NC,TX,VA	2.80	2.79	2.78	7.00	6.98	6.96	11.20	11.16	11.14
Tomatoes	States ^b	31.24	32.28	33.13	78.09	80.69	82.82	124.95	129.11	132.51
Fruits										
Blueberries	AL,AR,FL,GA,MS,NC	9.23	9.54	9.79	23.07	23.84	24.47	36.91	38.14	39.14
Strawberries	FL,NC	3.03	3.09	3.15	7.58	7.73	7.86	12.12	12.38	12.58
Apple	NC,TN,VA,WV	2.41	2.46	2.50	6.01	6.14	6.24	9.62	9.82	9.99
Oranges	FL,TX	17.43	17.79	18.09	43.57	44.47	45.21	69.71	71.16	72.34
Peaches	States ^c	6.80	6.94	7.05	16.99	17.34	17.63	27.18	27.75	28.21
Grapefruits	FL,TX	6.97	7.11	7.23	17.42	17.78	18.08	27.88	28.46	28.93
Grapes	GA,NC,VA,AR,TX	0.98	1.00	1.02	2.45	2.50	2.54	3.92	4.00	4.07

^a=Cucumber fresh market

^b= Cucumber processing pickle.

States^a=AL,AR,FL,GA,MS,NC,SC,OK,VA,TX

States^b=AL,AR,FL,GA,NC,SC,TN,TX,VA

States^c=AL,AR,GA,NC,SC,VA,WV,TX