OSHA News

Shoe Policy Reduces Slips and Falls

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In early 2010, John Hillard, then safety director for Giorgi Mushroom Company, approached me about creating a shoe policy for the Giorgi companies. The goal was to reduce the number of slip\fall accidents occurring on our farms. Slips and falls at Giorgi, like most farms, were our leading cause of accidents. John asked for my assistance in researching an effective policy.

The first step was to determine what would be the safest shoe design. After several hours of researching online, I found an article entitled "The Effect of Shoe Sole Tread Groove Depth on the Friction Coefficient with Different Tread Groove Widths, Floors and Contaminants" (Li, KW, Wu, HH, Lin, YC, Liberty Mutual Research Institute for Safety, Hopkinton, MA). This article became an invaluable resource. The authors tested various shoe sole designs and measured the performance of each. The shoe's "performance" was measured using a value called the coefficient of friction. This measures the amount of force required to move an object (shoe) across a given surface (floor), assuming the amount of downward force applied (a person's weight) is a constant value. The friction coefficient was measured under varying conditions, for example, rubber (shoe sole) on concrete (floor). Rubber on dry concrete yields a friction coefficient of 1.0, one of the highest values measured. Conversely, rubber on wet cement yields a value of 0.3, one of the lowest measured.

While the material from which the shoe sole was made contributed to its slip resistance, tread depth and width were greater contributors to the shoe's overall performance. The tread allows water and other substances that build up underneath the shoe to be expelled out each side, allowing the sole to have greater contact with the floor surface. Just like good tires on your car, shoe soles with adequate tread depth do not allow the person to "hydroplane."

Based upon the data presented in the report, we believed a tread depth of 3mm was optimal because beyond that mark the data showed diminishing returns. Also, these data suggested that 2mm would be the minimum acceptable depth because at any lower tread depth the performance of the shoe declined sharply.

For our policy to be both successful and uniformly applied, John and I believed the determining factors for compliance had to be quantifiable. Armed with the metrics we extracted from the report, we now could hold employees accountable to a well defined standard. Our footwear policy, therefore, would include the following:

- The policy applies to any individual working in a mushroom plant
- Shoes must have a clear distinction or separation between the heel and toe sections

- 3mm is the optimal tread depth; 2mm is the minimum acceptable. If tread depth is between 2 and 3mm the employee will be informed that his\her shoes will need to be replaced soon. A depth of 2mm or less requires a change of shoes within 24 hours.
- Any employee not in compliance after the 24 hour grace period will not be allowed to work until they have safe footwear
- Shoes will be checked regularly, and tread depth will be measured at the lowest point on the sole.

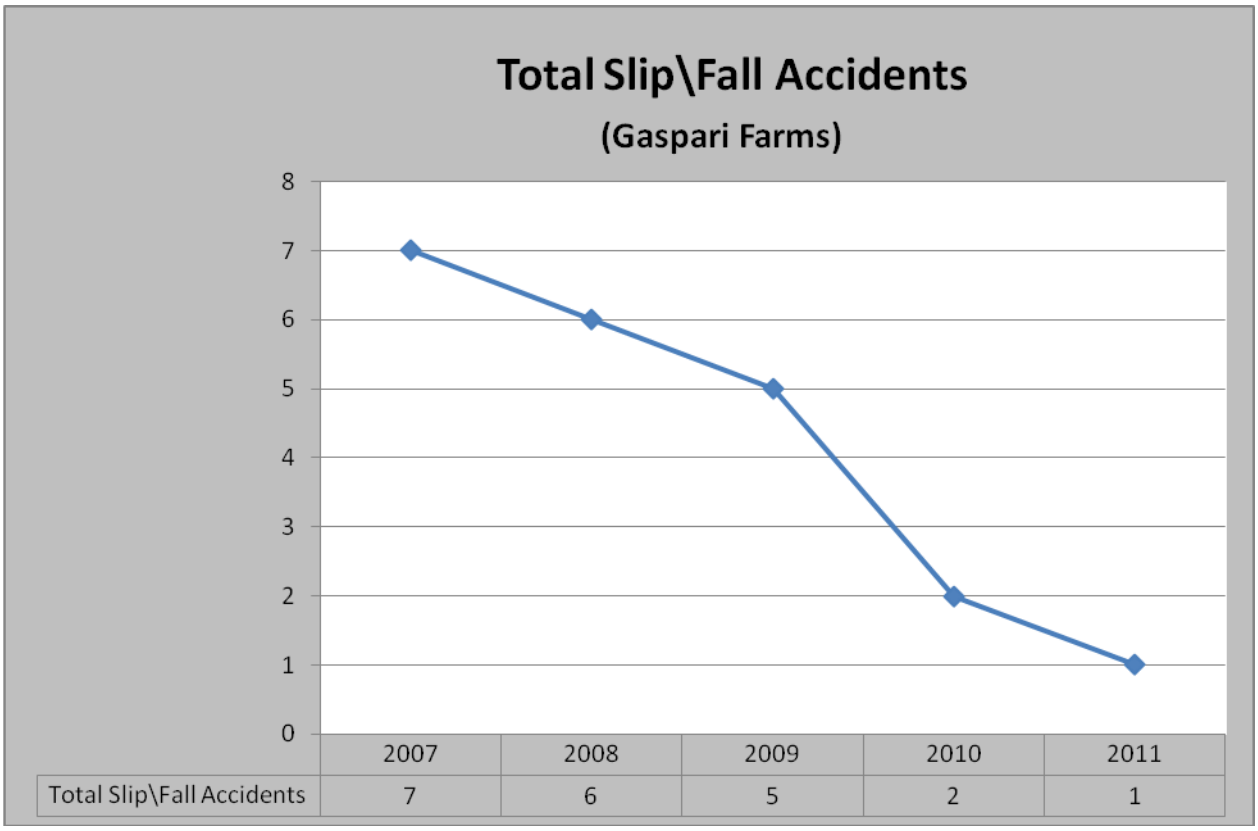
(Note: While tread width also significantly improves shoe performance (the optimal value was 5mm in the report), we decided to focus on depth first. We believed that initially focusing on both depth and width would make the new policy too burdensome for employees. Tread width may be added in the future.)

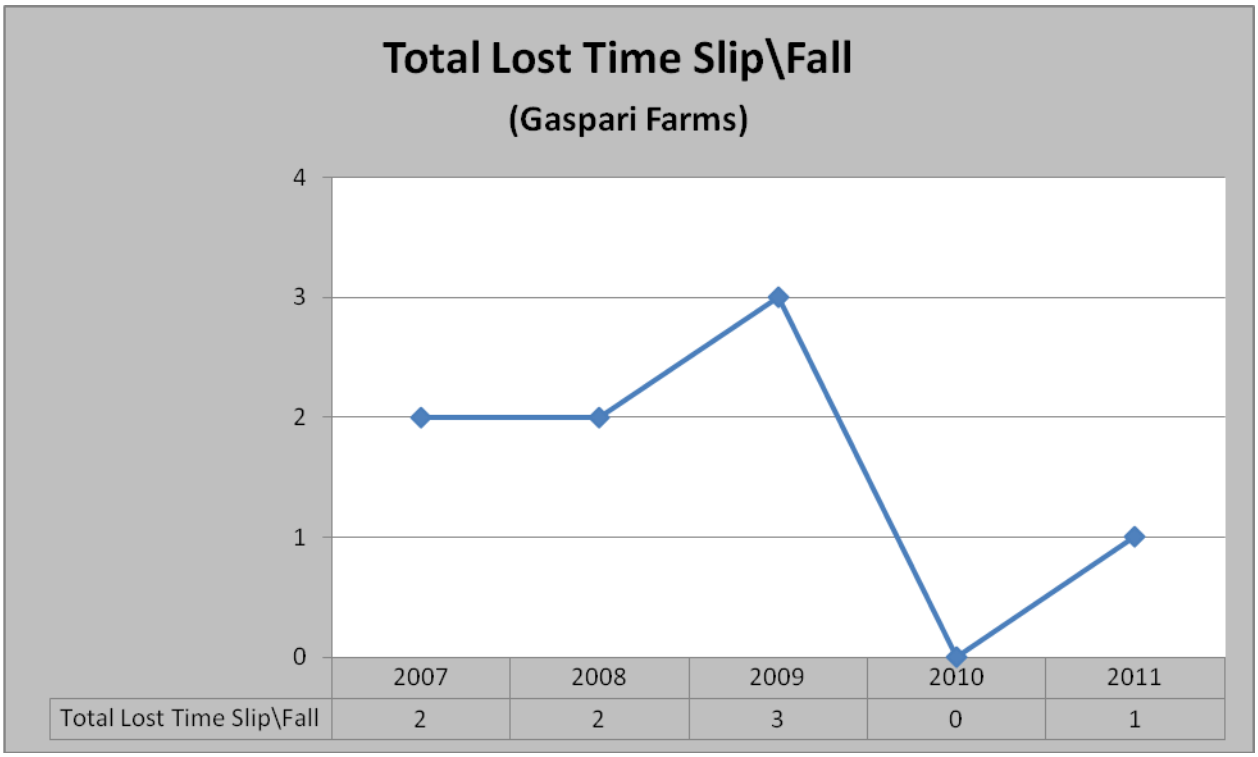
In order to measure tread depth accurately, we would use a caliper with a digital readout. Therefore, test results would be clear and non-negotiable.

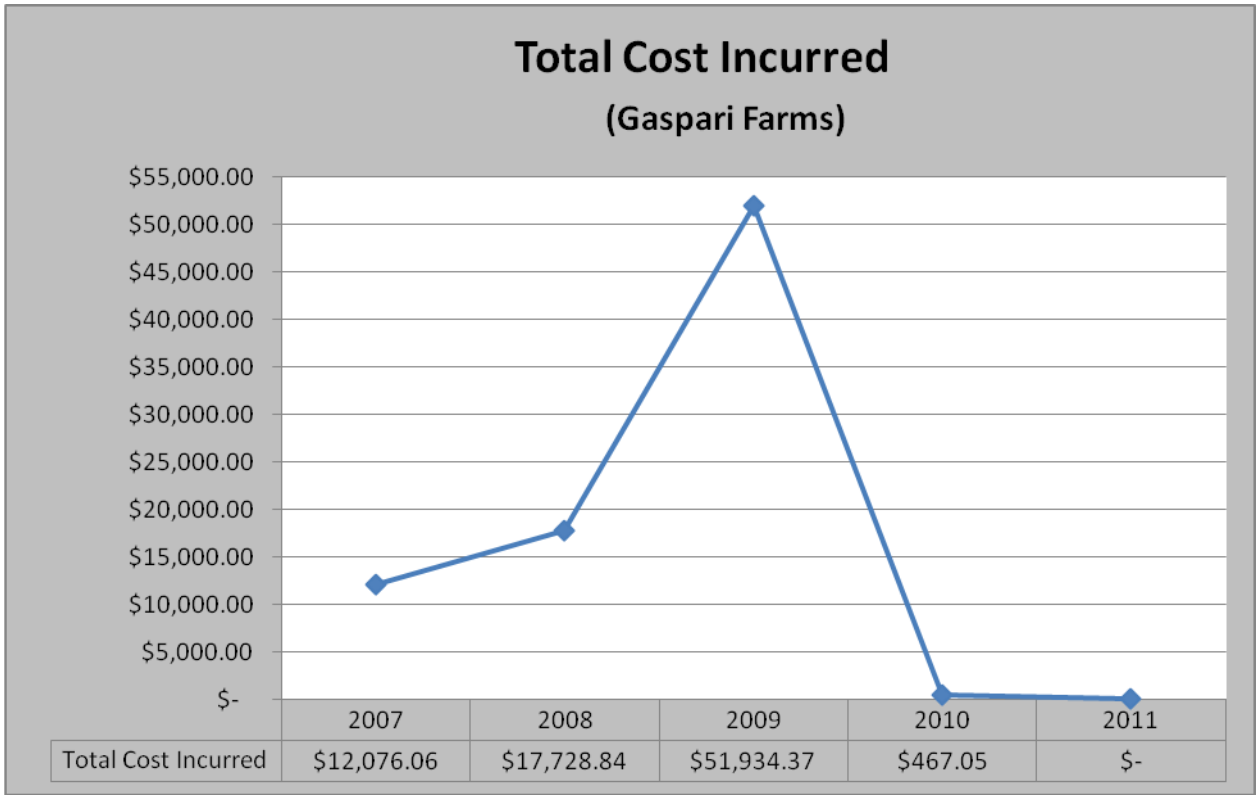
The employees were told about the new policy and were given a reasonable amount of time to become compliant. In order to assist employees with compliance we negotiated a 10% discount at a local shoe store most of our employees patronized. All they had to do was show their company issued ID card at the time of purchase.

On March 15, 2010, our new shoe policy went into effect at both Gaspari Farms, Inc. and Dew Fresh, Inc. While a few employees offered resistance, the vast majority were in compliance without issue. By the end of calendar year 2010 the effect of the policy was readily apparent (see graphs). The total number of slip\fall accidents was cut by more than half at Gaspari Farms, and by 80% at Dew Fresh. The number of lost time accidents as a result of slips and falls dropped to zero at both farms. Equally as impressive was the decline in expenditures for these injuries. At Gaspari Farms our outlay for slip\fall accidents went from a three year high of $51,934.37 in 2009 to just $467.05 in 2010. At Dew Fresh our expenditures went from $25,032.98 in 2009 to $4,052.57 in 2010. We now are nearing the end of 2011, and, as you can see by the graphs, the policy has continued to yield positive results at both farms.

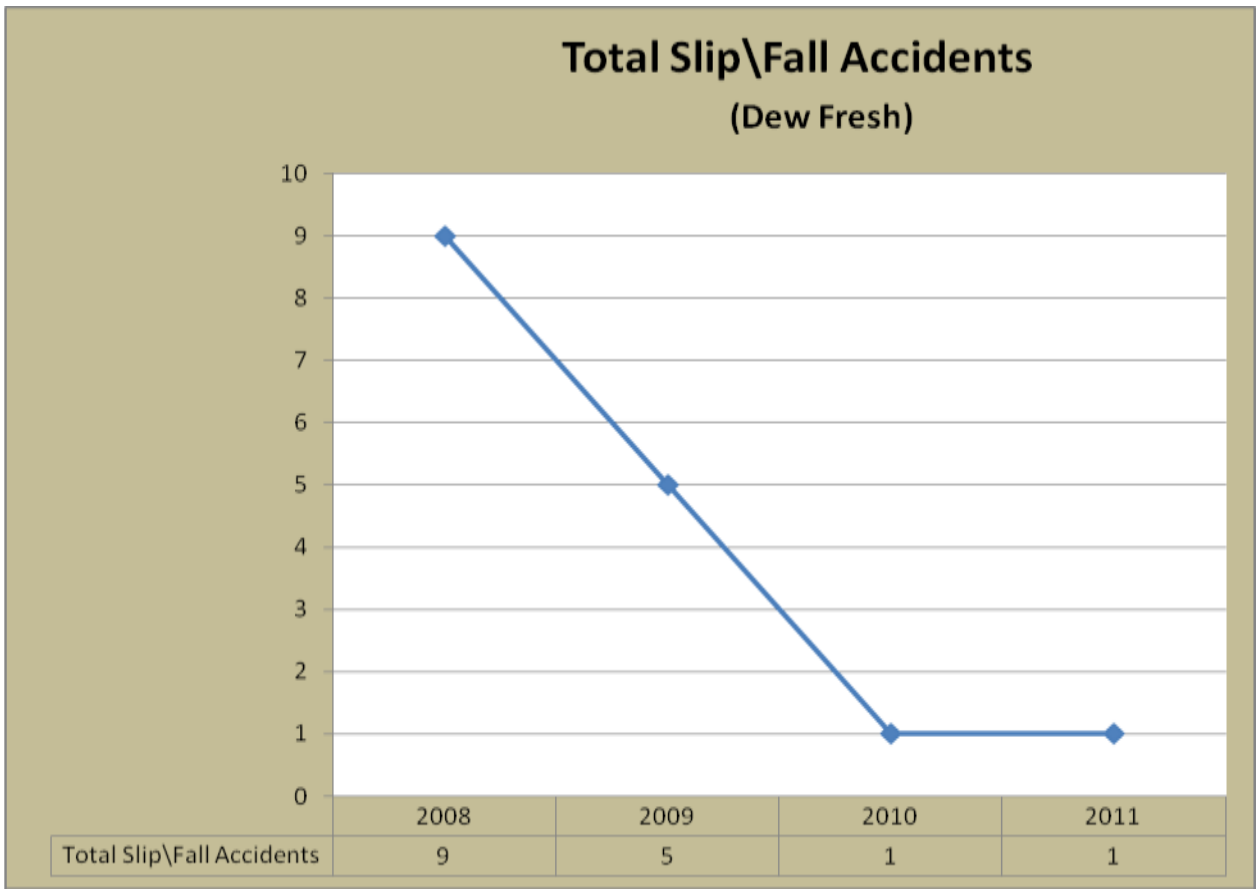
Because of the success experienced at Gaspari Farms and Dew Fresh, efforts are underway to implement the policy at our other farms. As with any new or existing policy, the most significant issue is maintaining compliance. In order for this policy to be effective it must be enforced through regular inspections. Daily visual inspections by supervisors are easy; if you see an employee wearing a shoe style that is obviously not compliant, issue a warning. Then, regular (I advocate weekly or bi-weekly) inspections using the digital caliper remind employees that you are watching and that compliance is mandatory. Once implemented, you must remain vigilant; even the best employees may migrate away from policies and standards unless they constantly are held accountable. The continued success of your program will depend on it.


Total Slip\Fall Accidents
(Gaspari Farms)
8
7
6
5
4
3
2
1
0
2007
2008
2009
2010
2011
Total Slip\Fall Accidents
7
6
5
2
1

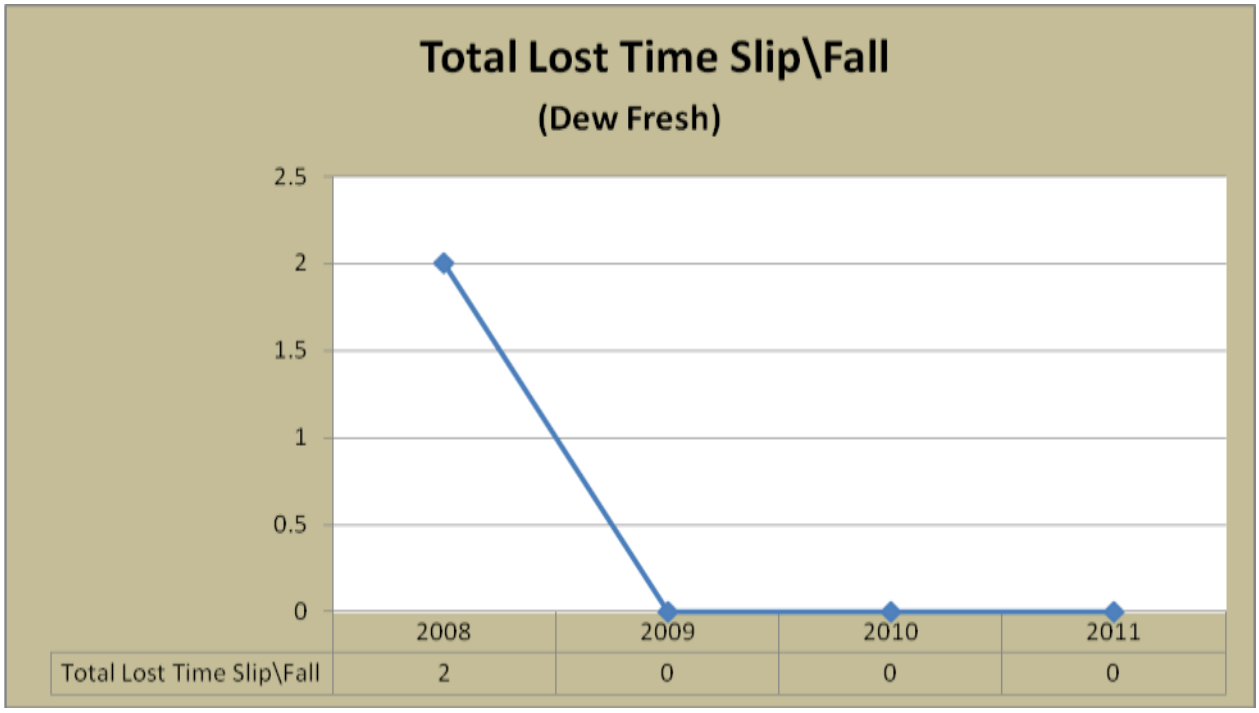

Total Lost Time Slip\Fall
(Gaspari Farms)
4
3
2
1
0
2007
2008
2009
2010
2011
Total Lost Time Slip\Fall
2
2
3
0
1

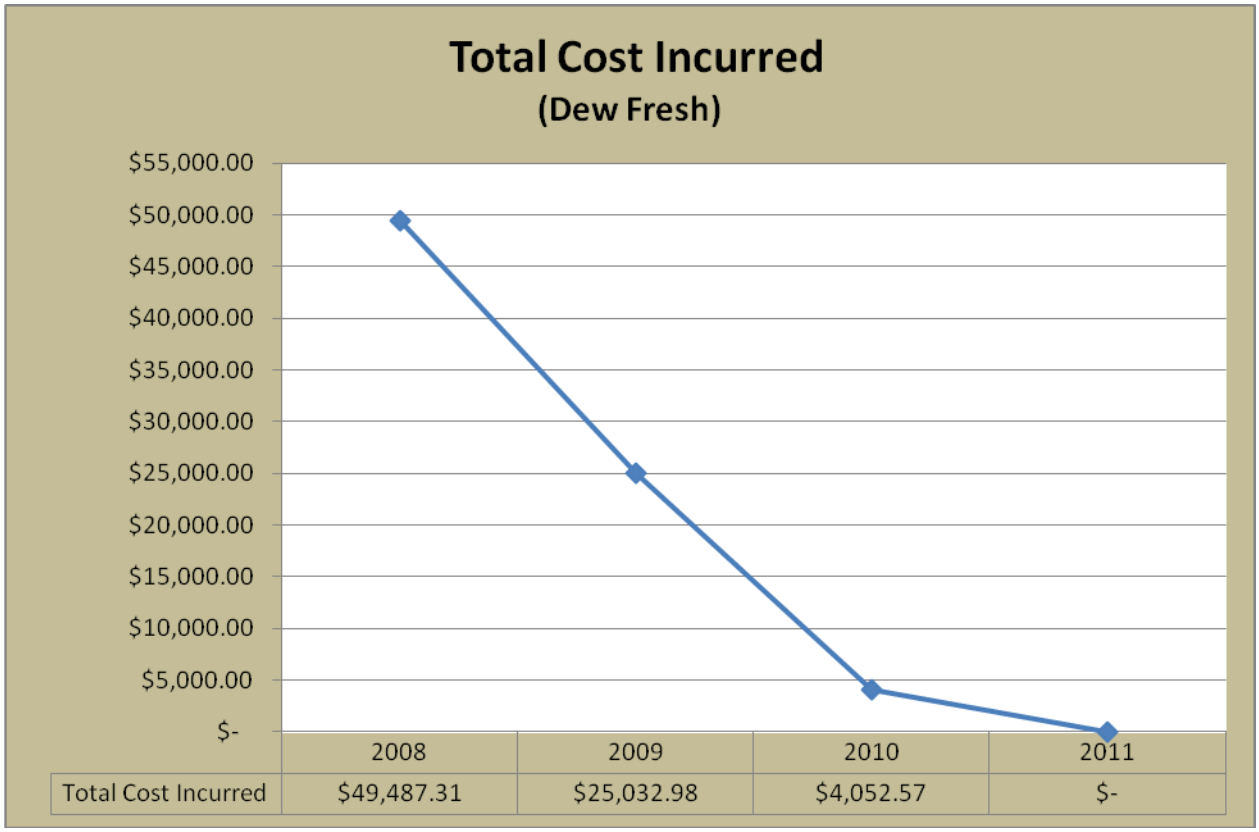


	2007	2008	2009	2010	2011
Total Cost Incurred	$12,076.06	$17,728.84	$51,934.37	$467.05	$-



	2008	2009	2010	2011
Total Slip\Fall Accidents	9	5	1	1


Total Lost Time Slip\Fall
(Dew Fresh)
2.5
2
1.5
1
0.5
0
2008
2009
2010
2011
Total Lost Time Slip\Fall
2
0
0
0


Total Cost Incurred
(Dew Fresh)
$55,000.00
$50,000.00
$45,000.00
$40,000.00
$35,000.00
$30,000.00
$25,000.00
$20,000.00
$15,000.00
$10,000.00
$5,000.00
$-
2008
2009
2010
2011
Total Cost Incurred
$49,487.31
$25,032.98
$4,052.57
$-