The homology algebra $H(\Omega^2 S^{2n+1})$ with $\mathbb{Z}/p$ - coefficients, p = odd prime :

Step 1. Let R be any comm ring. Then $H(\Omega S^{2n+1}) = P[z_{2n}]$ = polynomial algebra and ΩS^{2n+1} is formal, that is, there is a homology isom of differential coalgebras

$\Theta : P[z_{2n}] \longrightarrow C(\Omega S^{2n+1}) = \Omega S^{2n+1}$

Proof: Use the associative Moore loop space. Then $C(\Omega S^{2n+1}) = \Omega S^{2n+1}$ is an associative differential algebra. The $2n$ - th Eilenberg subcomplex of ΩS^{2n+1} is homotopy equivalent and has simplices with $2n$-skeleton = pt.

$\therefore \exists$ primitive cycle $x_{2n} \in C_{2n}(\Omega S^{2n+1})$ which represents a homology generator.

Set $\Theta(z_{2n}^k) = x_{2n}^k$ and check that Θ is a ~~—~~ homology isom of diff coalgebras.