California High School's Offensive Scheme Adds Randomness to Football

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With an undermanned squad, Piedmont High School's coaches got creative to beat bigger rivals

By Richard Morgan

By the numbers, the Piedmont Highlanders should not have won so many football games. The squad at the Piedmont, Calif., high school was cobbled together from slim pickings—thanks to an 800-person student body that's half the size of the other schools in their division.

But head coach Kurt Bryan and Steve Humphries, the Highlander's offensive coordinator, invented a secret weapon to keep them competitive: the A-11 offense.

View Slide Show of the plays.

Last year, Piedmont won a surprising seven of their 11 games before losing in the play-offs—an improvement over winning five and losing five in 2005 and tallying six wins and suffering five losses in 2006. Humphries predicts that without the installment of A-11, they would have gone four and six in the win–loss column in 2007.

A-11 puts the quarterback in the shotgun formation—seven yards behind the line of scrimmage—and replaces linemen with receivers. What does all this mean? Essentially, the scheme makes all 11 members of the team potential, eligible receivers.

This year, they're upping the ante: in 2007 they ran A-11 plays 60percent of the time; next year, it will make up 85 percent. "We expect to go 8-2 this year and get deeper into the playoffs," Humphries says.

Using a standard formation, a team can throw to five out of six players—wide receivers, tight ends, running backs and the quarterback. A-11 changes the odds of a play going to a particular team member from five out of six to five out of 11. The strategy even allows for two, three or four quarterbacks on the field.

In a standard formation with five fixed linemen, a play can unfold with 36 different scenarios for who receives the snap and who ends up with the ball—including a quarterback sneak. In the A-11 offense, because the receivers and linemen (and even quarterbacks) are

interchangeable, the number of different possibilities for what can happen on a given play skyrockets to 16,632.

When the Highlanders went up against division leader, the undefeated Las Lomas High School Knights, Humphries believes "they should've wiped us off the map 100 to nothing." But with seven minutes left in the fourth quarter, Piedmont had the ball and was only 14 points behind.

The Highlanders didn't win. But they got closer than they would have with conventional plays.

"Football is so conservative," Humphries adds. "There's not a lot of strategy if you're just smashing 300-pound guys together in predictable ways. A-11 filters that out so everyone is active and nimble—like soccer."

There's more than just speed and quickness to A-11, say some game theorists.

"Anything that adds permutations, but also adds mystery about pattern makes this more complicated to decipher," says John Lindhe, a mathematician at Northeastern University in Boston who has blogged about A-11. "Football has all these [gimmick] plays—Statue of Liberty, hook and ladder—that are seldom seen because they're very decipherable."

But, because A-11 has so many options, it's harder for would-be tacklers to figure out what is going to happen on a particular play. The guessing game that A-11 causes is the key to any successful gridiron strategy.

"What we're seeing here—and I think this is great—is amping up the noise to hide the signal of what's going on exactly," says Ian Ayres, a game theorist and economist at Yale University. "Randomization is key to any real sustainable victory. It is the only way to prevent the opposition from developing a statistically sound response to your behavior.

If an opposing team can study previous games and determine what you are likely to run in certain situations, they can be better prepared to stop you. "If you are making random choices, it's harder to respond," Ayres explains. "A-11 offers a kind of controlled randomness."

The closer a team gets to total randomness, says Ayres, the harder they are to beat. "Any coach would be much better off using a cheap [Microsoft] Excel random number generator to make their decisions."

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