Some Brief Thoughts on 17×17

We know that there is a rectangle free set of 17×17 of size 74. Try to prove that there is not rectangle free set of 17×17 of size 75. If this is done then the possibilities for how much of each color will be cut down.

Personally I think that each column has 5 of one color and 4 of the other three. Assume this is correct. Then map each column to the color that appears 5 times. Since there are 17 colors there will be some color that appears in 5 times in 5 columns. Is there a rectangle free subset of 5x17 which has 5 elements in each column? There is (too bad— if there wasn't that might help in a proof that there was no 4-coloring of 17×17). However, there is only one (up to perms of columns and rows). Here it is:

(NOTE: THE ABOVE STATEMENT SEEMS TO BE WRONG- THERE SEEM TO BE MORE THAN ONE. SEE A COMMENT ON MY MARCH 17, 2011 POST BY MARZIO DE BIASI.)

	1	2	3	4	5
1	R	R	R		
2	R			R	
3	R				R
4	R				
5	R				
6		R		R	
7		R			R
8		R			
9		R			
10			R	R	
11			R		R
12			R		
13			R		
14				R	
15				R	
16					R
17					R

So, can this be extended to a 4-coloring of 5x17 where each color aside from R appears 4 times in each column. If you can, that might be a building block in a full 4-coloring. If not that might be the first step in a proof that you cannot 4-color 17×17.

(Added later) ALAS- you CAN 4-color 5x17 where each color blah blah. Here it is:

4444433332222111
4333344442111222
4322231114444332
3432143214321441
3342124321413124